

SGFER

Research Environment for Smart Grids and Flexible Energy Resources

Task 2.1 Definition of the service concept and operation model of the FREESI laboratory

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Österbottens förbund
Pohjanmaan liitto

Regional Council
of Ostrobothnia

Programme for Sustainable Growth and Jobs

Leverage from
the EU
2014–2020



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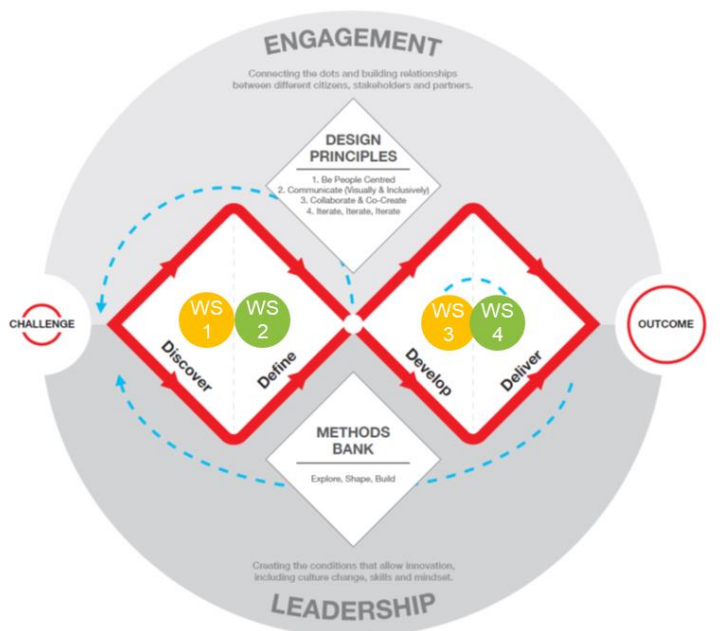
1 Introduction

This report summarizes the results of Task 2.1 of the project SGFER (Research Environment for Smart Grids and Flexible Energy Resources). Task 2.1 aimed to develop the service provision and operation model of the FREESI laboratory research environment, using service design to create systematic concepts for the research infrastructure services that business and academic partners need and in which development they are engaged. The laboratory environment developed co-creatively benefits the companies of the Vaasa Energy cluster and the regional, national, and international partners of VEBIC's university network. The approach developed in this task is to be extended to other VEBIC activities as appropriate.

The framework for this task follows the so-called double diamond model of service design presented in Figure 1a. The double diamond model represents the design and innovation processes describing the steps taken. The diamond on the left contains data collection and brainstorming, while the diamond on the right handles testing, prototyping, and solving ideas. The model has four sections: discover, define, develop and deliver. The first section looks for the things to be developed, which are discovered by communicating with people, collecting inspiration and insights, developing original ideas, and identifying user needs. The second section finds the most critical development items from the collected data. The third section tests the solution(s) by creating prototypes of them to get the best solution possible. The final section finalizes the solution, approves it, and implements it.

The service design process workflow and schedule are presented in Figure 1b. In the definition phase (1), the current situation was defined, and the task objectives were set by (i) identifying customers and their needs, (ii) a SWOT survey, and (iii) an internal workshop on customer segmentation and value proposition creation. In the research phase (2), the design idea was clarified and specified by collecting quality information about customers by (i) a customer survey and (ii) an external workshop (with companies and partners) for collaboration and gathering information on customer profiles and values. The gathered information was analyzed and synthesized through the third and internal workshop in the development phase (3) to develop as many possible product ideas as possible. As a result, the most promising ideas were turned into feasible service concepts by concretization and illustrations with the help of use case descriptions and modelling. In the testing and finalizing phase (4), the selected ideas

were tested in practice in the fourth and external (with the companies) workshop to discover what features must be developed further. The piloting phase (5) was excluded from this project.



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(a)

- 1) Definition phase (9/2021) WS 1
- 2) Research phase (10/2021) WS 2
- 3) Development phase (12/2021) WS 3
- 4) Testing and finalizing phase (1/2022) WS 4
- 5) Piloting phase (x/2022, excluded)

(b)

Figure 1. a) Double diamond model, adapted from [1], b) The service design process workflow.

2 The service design process

The following presents the design process workflow.

1.1 Definition phase

The definition phase identifies and describes the service's current situation in the company, the market, and the service pain points. Also, the project objectives are specified, and the challenges and opportunities of the service are determined. The aim is to learn more about existing solutions, limit the problem to be studied, create a shared understanding of development needs, find out what things are not yet known but are assumptions (e.g. weak signals), engage the various parties in the development, and set the meters and find out their initial values.

The definition phase was carried through the delimitations of the business model description, SWOT (Strengths, Weaknesses, Opportunities and Threats) survey, identification of the customers and their needs, and an internal (university personnel) workshop. The Business Model Canvas model [2] was utilized as a framework. Figure 2 presents the canvas and focus blocks used in this SGFER task 2.1. The aim was to get information on

Customers Segments

- To group customers into distinct segments with common needs, common behaviours, or other attributes
- A business model may define one or several large or small Customer Segments
- A conscious decision about which segments to serve and which segments to ignore

Value Propositions

- Each Value Proposition consists of a selected bundle of products and/or services that caters to the requirements of a specific Customer Segment. In this sense, the Value Proposition is an aggregation, or bundle, of benefits that a company offers customers.
- Values may be quantitative (e.g. price, speed of service) or qualitative (e.g. design, customer experience)

Key Resources

- Categorized into physical, financial, intellectual, and human

- Can be owned or leased by the company or acquired from key partners

Key Activities

- Categorized into production and problem-solving (e.g. activities such as knowledge management and continuous training)
- Platform/Network
 - Business models designed with a platform as a Key Resource are dominated by platform or network-related Key Activities
 - Networks, matchmaking, platforms, software, and even brands can function as a platform
 - Key activities related to platform management, service provisioning, and platform promotion

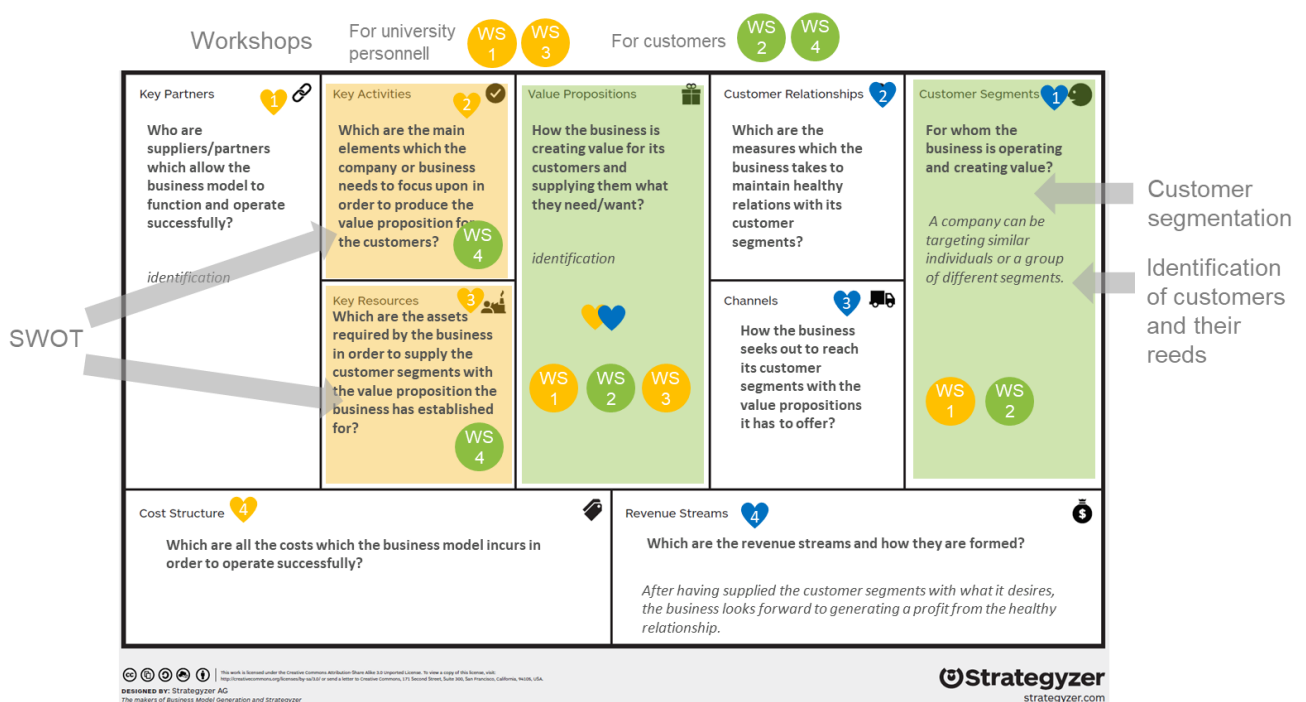


Figure 2. The use of the Business Model Canvas from [2].

1.1.1 SWOT survey

SWOT of smart grid laboratory research and testing services was identified through a survey of the personnel of the University of Vaasa. The survey was sent to 130 persons. The target groups were Smart Electric Systems (EE), Smart Electric Systems (AT), Smart Electric Systems (CS & TE), Renewable Energy, and Networked Value Systems (NeVS) research groups, and VEBIC and Digital Economy research platforms. Twenty responses were gained.

Hence the response ratio was 15,4 %. The main issues or questions of the survey are presented in Figure 3.

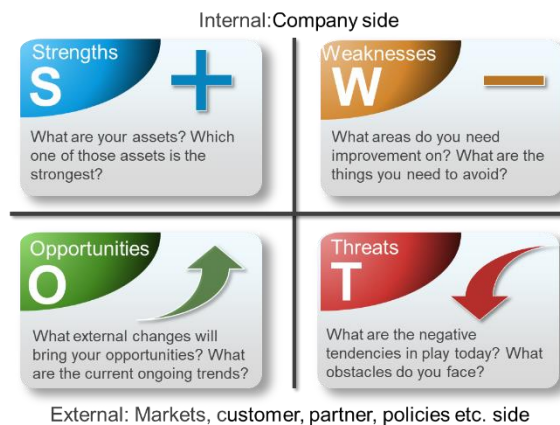


Figure 3. SWOT outline.

1.1.2 Identification of customers

Identifying the customers and their needs was conducted with Smart Electric Systems and Renewable Energy key personnel, who identified 55 companies and their contact persons. Also, the UWASA contacts were listed. Further, the probable needs of the companies were identified and estimated. Four customer types were defined: *old customer*, *important old customer*, *potential new customer*, and *potential new important customer*.

1.1.3 Workshop 1 – Customer segmentation

Ten companies were selected from the earlier defined 55 companies in the first (internal) workshop 1 (WS1). The aim was to estimate more precisely what these customers might be looking for.

First, the customers' needs patterns were identified, such as desired features, quality, price, service technology, or how the customers use the service. Next, the potential customer segmentation axes were outlined according to their features and patterns (what the customers are looking for). The potential segmentation axes were defined as "*Technology assessment and validation methodology*" and "*Need for system-wide knowledge*". Next, the ten selected companies were positioned in the segmentation axes. As a result, the potential customer segments were identified.

Further, the value proposition for the selected (one of the most important segments) was determined. The value proposition describes creating value for the customer and delivering what the customer wants. Figure 4 presents The Value Proposition Canvas [3] and its aim use. The Customer Profile part of the canvas for "Big Manufacturers" was completed in the workshop.

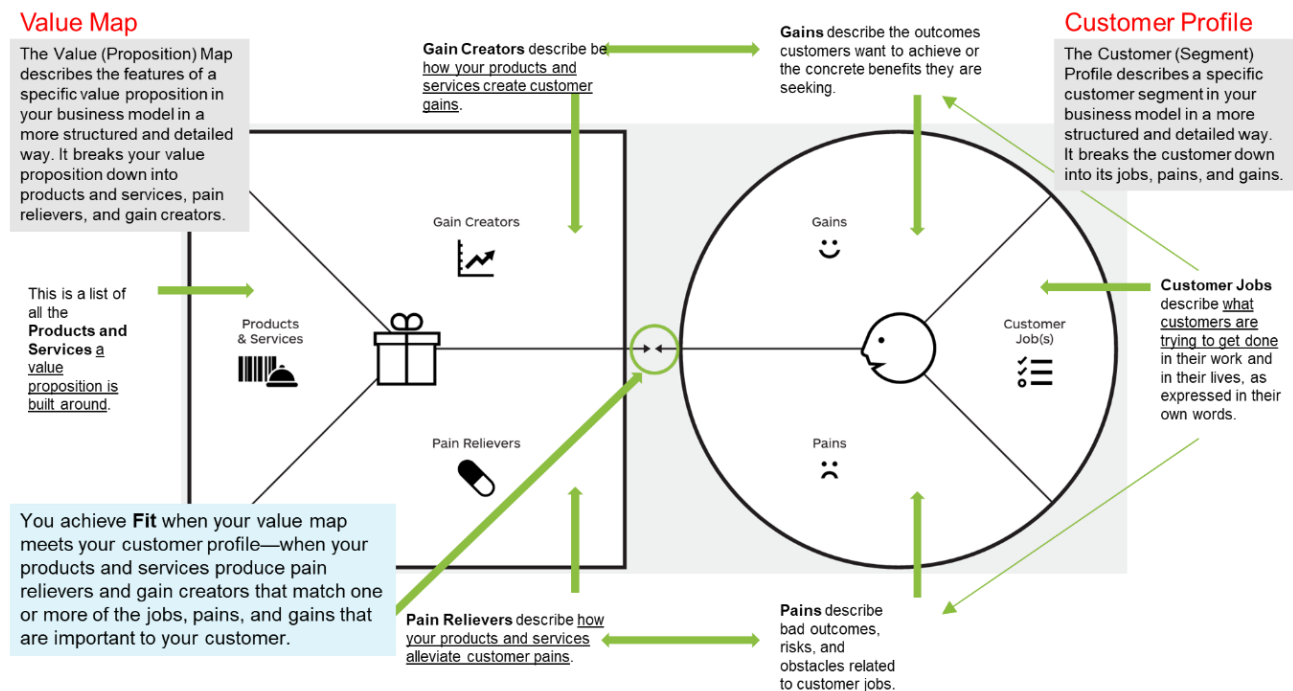


Figure 4. The Value Proposition Canvas [3].

1.1.4 Meters

The service development indicators can be considered to be related to understanding the customers' needs, the value proposition, and the internal issues at the university. These two aspects could be evaluated through surveys and interviews measuring the quality and development of services.

1.2 Research phase

The research phase clarifies and specifies the design challenge and collects quality information about customers or service target groups. This phase aims to find hidden expectations and needs, gain a holistic understanding of the customer, and build the design base holistically.

1.2.1 Customer survey

The customer survey was made 1.10. – 20.10.2021 for FREESI laboratory value proposition creation. The survey form is Appendix 1. The aim was to gain more insight into the goals and objectives of the customer's business, as well as knowledge of things they are happy or dissatisfied with. The questions were on a general level in the field and with the University of Vaasa. The aim was to define (a customer segment's) *Customer Profile* by customers' Jobs, Pains and Gains, and customers' Pain Relievers, Gain Creators, and potential Products and Services, forming a customer segment's *Value Map*. In this survey, the customer segments were divided according to industrial classification:

- Manufacturing (1)
- Electricity, gas, steam, and air conditioning supply or water supply; sewerage, waste management, and remediation activities (4)
- Information and communication (1)
- Professional, scientific, and technical activities (engineering, scientific research, and development) (1)
- Education
- Financial and insurance activities

The survey was sent to 169 persons from 101 companies. Seven responses were collected. The number of responses from each industry class is marked in the list above at the end of each item in brackets. The response ratio was 4,1 % persons representing 6,9 % of companies. One company gave the results via email. The survey results were utilized for organizing workshop 2 (WS2).

1.2.2 Workshop 2 – Raising awareness and increasing knowledge

WS2 was organized on 26.10.2021, and the program is in Appendix 2. The workshop aimed to introduce the Smart Grid research platform and funding opportunities, collaborate, and better understand the customers.

First, the financing bodies presented their current financing opportunities. After that, the SGFER project was generally presented. Further, the Smart Electric Systems (SES) research

activities and the research teams, Smart Grids (SG) and Flexible Energy Resources (FER) were introduced. Also, the FREESI laboratory and its development were presented. In the introductory part, there were 35 participants. In the workshopping part, the customers worked with the Value Proposition Canvas. Three groups were organized representing three customer segments, which were Energy Infrastructure Providers (EIP), Device Manufacturers (DM), and Integrators & Incorporators (I&I). In the group works, there were five people from companies and 11 from the university. The workshopping part aimed to gain enhanced customer profiles of the customer segments. In addition, one company gave the workshop part information via email.

1.3 Development phase

The development phase aims to develop as many different solutions as possible. In this phase, ideas are turned into feasible service concepts, which can be tested with the help of prototypes. Essential is to approach the problem uncritically and as far as possible to get many different ideas that can then be accepted or rejected and combined. The third workshop (WS3) was organized for the university personnel to develop potential ideas, which could be turned into products and services.

1.3.1 Workshop 3 – Product ideas development

The customer survey, WS1, and WS2 results were summarized as the preparatory work. Then the customer profile and value proposition were defined for the segments of Energy Infrastructure Providers (EIP), big Device Manufacturers (DMb), and small Device Manufacturers (DMs). Hence the workshop aimed to create as many product ideas for these three segments.

Eleven key persons participated in the workshop. Three working groups were organized according to the customer segments. Many ideas were generated, and the best ones were voted on. The DMb & DMs were combined. As a result, two preliminary product/service ideas per segment were selected to be developed further:

for the EIP segment – to support their system-level understanding

- 1) system-level simulations, and
- 2) Active Distribution Network Management (ADNM) research services and,

for the DM segment – to support their product development

- 1) real-time simulation and hardware-in-the-loop (HIL) testing, and
- 2) battery cell testing, characterization, and modelling service.

1.4 Testing and finalizing phase

The selected ideas are tested in practice to discover what to develop further in the testing phase. Testing was executed through the fourth workshop (WS4) with the customers. The outcome of the workshop aids in finalizing the offering.

1.4.1 Workshop 4 – Product ideas testing

WS 4 aims to get customer feedback to finish the product design. In the workshop, two products were presented and tested on the customers' comments and feedback. These two products were presented to customers as follows:

Offering 1 for Energy Infrastructure Providers SUPPORT OF SYSTEM-LEVEL UNDERSTANDING

"Our goal is to offer system-level understanding by simulation and documentation which aids the customer *to gain* knowledge of how the energy transition will take place and affect the distribution grid and *to cope* with the fluctuating generation, EV, electrification of heating, demand elasticity, etc. by impact studies, documentation, and more targeted research."

Offering 2 for Device Manufacturers: SUPPORT OF PRODUCT DEVELOPMENT

"Our goal is to offer product development support by RT-simulation and HIL testing which aids the customer *to gain* advancement in their businesses and *to cope* with testing and expertise resources lack by compatibility studies, and documentation."

A general level workflow of FREESI lab services provision was presented in Figure 5. Next, the research and documentation processes were evaluated in two working groups representing the EIP and DM segments. Figure 6 shows the research and testing level use cases for the EIP and DM segments, a) includes literature review, modelling and simulation, and documentation, and b) includes hardware-in-the-loop (HIL) testing.

In the EIP group, the Modelling and simulation use case(s) were evaluated for the ancillary services scenarios and operations to be utilized in ADNM development. In the DM group, the software-in-the-loop (SIL), controller-hardware-in-the-loop (CHIL), and power-hardware-in-the-loop (PHIL) testing use cases were evaluated for grid compatibility testing to be utilized in product development.

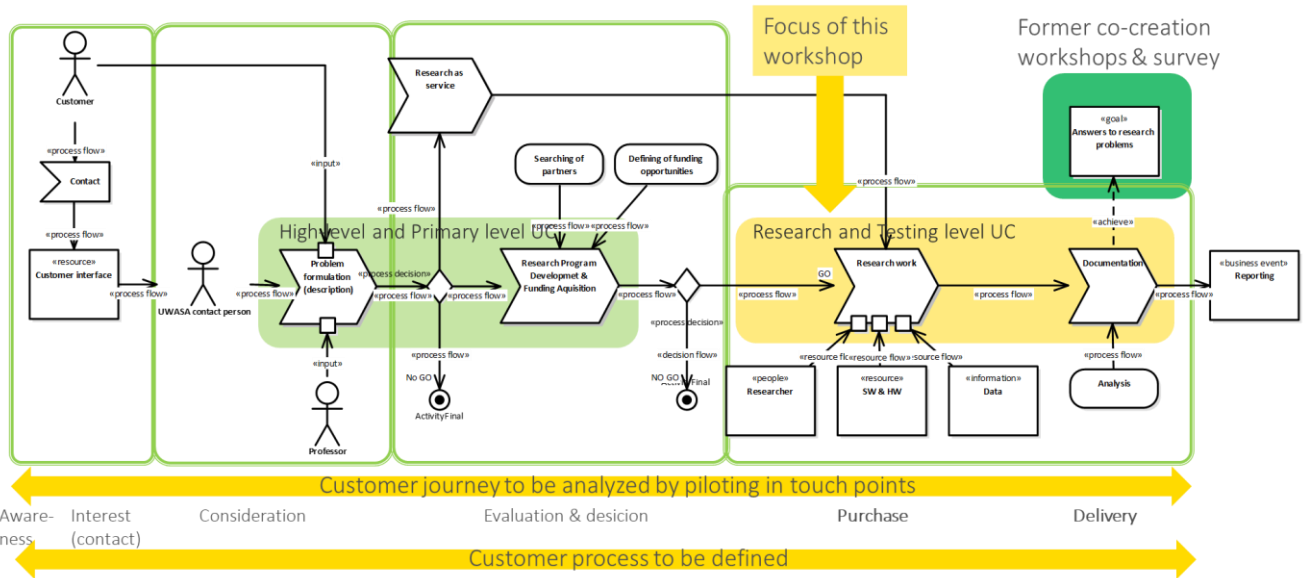


Figure 5. A general level workflow of FREESI lab services provision.

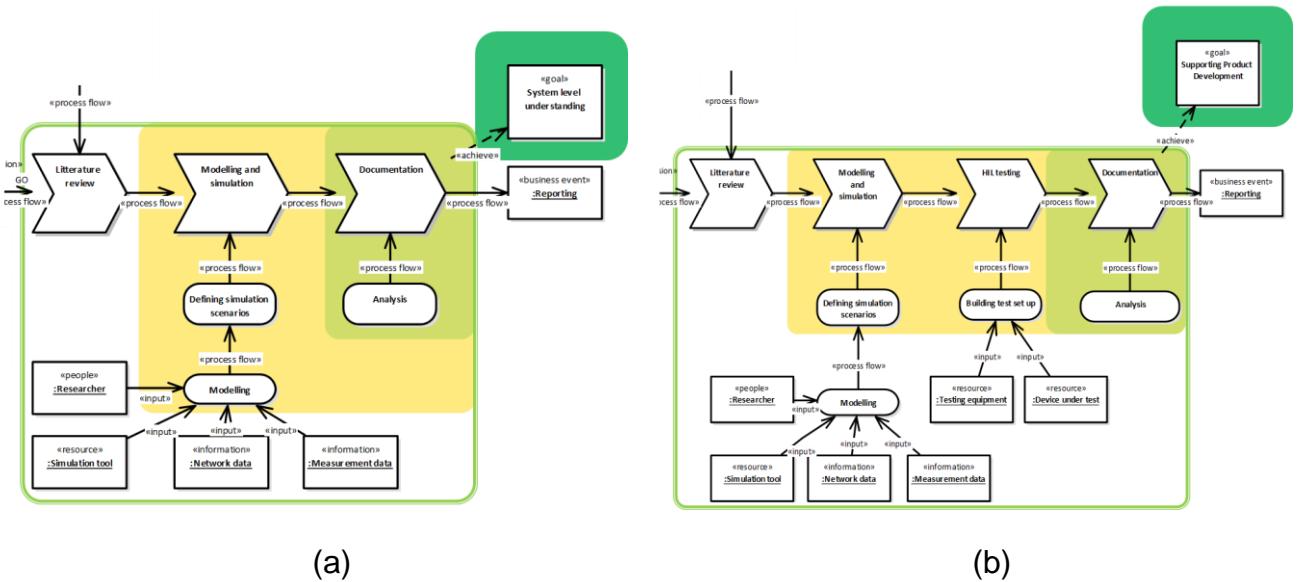


Figure 6. Research and testing for a) system-level understanding and b) product development support.

1.4.2 Additional workshop – Crossed SWOT

Strategies building workshop was an additional force aiming to take a step forward from SWOT analysis to cross SWOT analysis (also known as TOWS Matrix). The idea of the crossed SWOT is to find logical pairs of strengths and opportunities (SO), strengths and threats (ST), weaknesses and opportunities (WO), and weaknesses and threats (WT) as the basis for building potential strategic actions (tactics) for the future. This analysis helps to identify strategic alternatives that address the following additional questions:

1. Strengths and Opportunities (SO) – How can we use our strengths to take advantage of the opportunities? (OFFENSIVE/PROACTIVE ACTIONS)
2. Strengths and Threats (ST) – How can we take advantage of strengths to avoid actual and potential threats? (REACTIVE ACTIONS)
3. Weaknesses and Opportunities (WO) – How can we use opportunities to overcome the experienced weaknesses? (ADAPTIVE ACTIONS)
4. Weaknesses and Threats (WT) – How can we minimize weaknesses and avoid threats? (DEFENSIVE ACTIONS)

The SWOT survey results were utilized in this workshop, and the strategies were developed with the key personnel.

1.4.3 Finalizing the offering

The results of WS4 were utilized to finalize the product and services offering, differentiate them, and develop an offering map. The product offering of the FREESI laboratory is illustrated in Figure 7 in terms of customer value (why they need it). Further, Figure 8 presents the product portfolio describing the service lines. The developed use case (UC) descriptions, UC diagrams, and workflow (blueprint) outline the service specifications and guidelines by describing customer touchpoints, features, and interactions that support the products and services implementation.

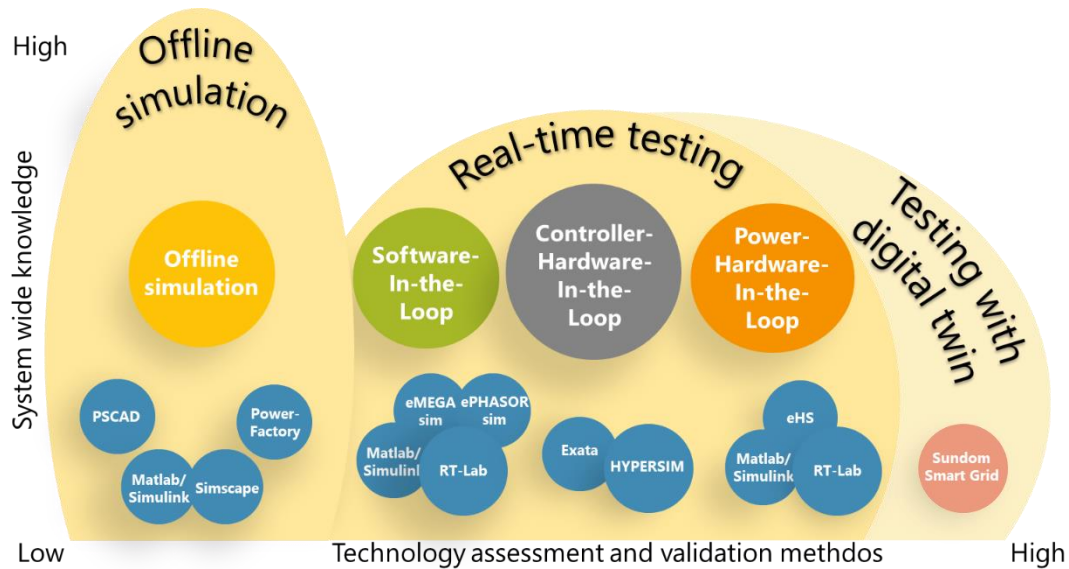


Figure 7. Services offering of the FREESI laboratory.

	OFFLINE SIMULATION	SIL TESTING	CHIL TESTING	PHIL TESTING	HIL TESTING WITH DIGITAL TWIN	
What-if scenarios analysis	✓	✗	...	
Ancillary services development	✓	✓	✓	✓	✓	
Grid compatibility testing	✓	✓	✓	✓	✓	
Fault management (protection, fault location)	✓	✓	✓	...	✓	
Distributed energy resources (DER)	✓	✓	✓	✓	✓	
TSO/DSO interfacing	✓	✗	✗	✗	✗	
Control effects over different voltage levels	✓	✓	✓	✗	...	
Battery cell modelling and testing	✓	...	✗	✗	✗	
Asset management	✓	✗	✗	✗	✗	
ICT IEC61850, time synchronization	✓	✓	✓	✗	✓	✓ used
Cybersecurity	✓	✓	✓	...	✓	✓ coming soon
						✗ not applicable
						... possible

Figure 8. The product portfolio of the FREESI laboratory.

The customer journey map will be created following this project task, describing how the user interacts with the service throughout its touchpoints and organizational activities and roles responsible for these activities. Also, a service road map is to be developed aligned with the FREESI laboratory facilities development roadmap describing the service execution over time, from a minimum set of functionalities to deliver the full experience of the vision.

1.5 Piloting phase

The finalized service concepts are brought to market for testing in the piloting phase. Necessary is to get measurable results; in this case, by internal company evaluation and customer interviews. The service is evaluated, and continuous service evaluation and development are ensured with service development indicators (defined in the definition phase). The service evaluation ensures that the service is competitive and achieves the desired benefit. Piloting the services was left for future work, in which the pilot cases and the customers are defined.

The piloting plan outline is following:

- Goals
- Piloting time
- Test customer segments
- Deployment plan
- Feedback
- Challenges

3 Summary

This SGFER Task 2.1 aimed to develop the service provision and operation model of the FREESI laboratory research environment using service design. The selected development method was the so-called Double Diamond model. The service design was executed through definition, research, development, testing, and finalizing phases. The phases included several workshops and survey work with the university personnel, companies, and other partners. The customers were defined and segmented in the service design work, and offerings for the segments were determined. Two main products were developed and tested, the workflow of service provision by use cases defined and product portfolio described, namely offerings for:

1. EIP to give support of system-level understanding and
2. DM to provide support for product development.

These products are to be produced through FREESI lab services (Figure 7) within the framework (i.e., segmentation axes) of (i) system-wide knowledge and (ii) technology assessment and validation methods. In addition, the product portfolio was developed for these services.

Piloting of the developed products is to be executed in future projects.

This method can be utilized for the further development of FREESI lab's or VEBIC's products and services.

References

- [1] Design Council, “What is the framework for innovation? Design Council’s evolved Double Diamond,” 2019. <https://www.designcouncil.org.uk/news-opinion/what-framework-innovation-design-councils-evolved-double-diamond> (accessed Jan. 28, 2022).
- [2] Strategyzer, “The Business Model Canvas.” <https://www.strategyzer.com/canvas/business-model-canvas> (accessed Jan. 28, 2022).
- [3] Strategyzer, “The Value Proposition Canvas.” <https://www.strategyzer.com/canvas/value-proposition-canvas> (accessed Jan. 28, 2022).

Appendices

- [1] Customer survey form.
- [2] Program of the workshop 2.

Appendix 1. Customer survey form.

SGFER Value Proposition – Customer Profiling



VEBIC

UNIVERSITY OF VAASA

Tämä kysely liittyy VEBIC:n FREESI-laboratorion ja älyverkkotutkimustoimintamme kehittämiseen. Kehitämme palvelukonseptiamme yhteiskehittelyn menetelmin Pohjanmaan liiton rahoittaman SGFER-hankkeen avulla.

Tämän kyselyn tarkoituksena on lisätä ymmärtämystämme teistä. Kyselyn tuloksia hyödynnetään myös työpajatyöskentelyn 26.10.2021 järjestämisessä, johon olet saanut erillisen kutsun.

Toivomme saavamme lisää käsitystä toimintanne tavoitteista ja päämääristä sekä tietoomme asioita, joihin olette tyytyväisiä tai tyytymättömiä. Kysymykset ovat otsikoituina sekä yleisellä tasolla että kanssamme.

Kysely on viisivuvinen. Ensin kysymme toimialanne. Seuraavalla sivulla kysymme toimintanne tavoitteista ja päämääristä. Tämän jälkeen keskitytään ongelmiinne ja huoliinne sekä tarpeisiinne ja haluihinne.

Kysely tehdään anonymisti. Voit kuitenkin jättää yhteystietosi viimeisellä sivulla, jos haluat vastauksesi meille tiedoksi tai toivot kahdenvälisiä keskusteluja.

This survey is related to the development of VEBIC's FREESI laboratory and our Smart Grid research activities. We are developing our service concept using co-creation methods with the help of the SGFER project funded by the Regional Council of Ostrobothnia.

The purpose of this survey is to increase our understanding of you. The results of the survey will also be utilized in the workshop on 26.10.2021 to which you have received a separate invitation. We hope to gain more insight into the goals and objectives of your business, as well as our knowledge of things you are happy or dissatisfied with. The questions are titled both on a general level and with us.

The survey is five pages long. First, we ask about your industry classification. On the next page, we ask about the goals and objectives of your activities. This is followed by a focus on your problems and concerns as well as your needs and wishes.

The survey is conducted anonymously. You can leave your contact information on the last page if you would like to inform your reply to us or you want bilateral discussions.

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1. TOIMIALA / INDUSTRIAL CLASSIFICATION

- Teollisuus / Manufacturing
- Sähkö-, kaasu- ja lämpöhuolto, jäähdytysliiketoiminta tai vesihuolto, viemäri- ja jätevesihuolto, jätehuolto ja muu ympäristön puhtaanapito / Electricity, gas, steam and air conditioning supply or water supply; sewerage, waste management and remediation activities
- Informaatio ja viestintä / Information and communication
- Ammatillinen, tieteellinen ja tekninen toiminta (insinööripalvelut, tieteellinen tutkimus ja kehittäminen) / Professional, scientific and technical activities (engineering, scientific research and development)
- Koulutus / Education
- Rahoitus- ja vakuutustoiminta / Financial and insurance activities

2. TOIMINTANNE TAVOITTEET JA PÄÄMÄÄRÄT / YOUR OPERATIONAL OBJECTIVES AND GOALS (JOBS)

Mitkä ovat yrityksesi keskeiset tehtävät/tavoitteet, joita tekemättä/saavuttamatta yrityksesi ei voisi toimia? Mitkä ovat ne askeleet, jotka auttavat saavuttamaan tavoitteet?

What are the main tasks/goals of your company, without which your company would not be able to function? What are the steps that will help to achieve the goals?

3. TOIMINTANNE TAVOITTEET JA PÄÄMÄÄRÄT / YOUR OPERATIONAL OBJECTIVES AND GOALS (JOBS)

Missä eri ympäristöissä yrityksesi toimii? Miten toimintanne ja tavoitteenne muuttuvat näissä eri ympäristöissä? Mistä ja miten haluaisitte muiden tuntevan yrityksenne? Mitä voitte tehdä sen eteen?

In what different environments/contexts does your company operate? How do your activities and goals change depending on different contexts?

4. TOIMINTANNE TAVOITTEET JA PÄÄMÄÄRÄT / YOUR OPERATIONAL OBJECTIVES AND GOALS (JOBS)

Miten hyödynnätte tutkimus-, kehitys- ja testaustoimintapalveluja ja/tai yhteistyötä?

How do you leverage research, development and testing services and/or collaboration?

5. TOIMINTANNE TAVOITTEET JA PÄÄMÄÄRÄT / YOUR OPERATIONAL OBJECTIVES AND GOALS (JOBS)

Mitä tehtäviä sinä suoritat työssäsi? Mitä teknisiä tai toiminnallisia ongelmia yrität ratkaista?

What tasks do you perform in your work? What technical or functional problems are you trying to solve?

6. ONGELMAT JA HUOLET YLEISELLÄ TASOLLA / PROBLEMS AND CONCERNS GENERALLY (PAINS)

Mikä saa sinut tuntemaan yhteistoiminnan tai palvelun huonoksi tai jopa estää sinua hyväksymään sen? (Mitkä ovat turhautumisesi, ärsytyksesi tai asiat, jotka aiheuttavat sinulle päänsärkyä? Ovatko esim. investointikustannukset tai oppimiskäyrä esteenä?)

What makes you feel bad about collaboration/activity or a service or even prevents you from accepting such? (What are your frustrations, irritations, or things that cause you headaches?

(Are, for example, investment costs or the learning curve a barrier?)

7. ONGELMAT JA HUOLET YLEISELLÄ TASOLLA / PROBLEMS AND CONCERNS GENERALLY (PAINS)

Mitä riskejä pelkää? Pelkäätkö taloudellisia, sosiaalisia tai teknisiä riskejä tai mietitkö, mikä voisi mennä pieleen?

What risks are you afraid of? Are you afraid of economic, social or technical risks, or are you asking yourself what could go wrong?

8. ONGELMAT JA HUOLET KANSSAMME / PROBLEMS AND CONCERNS WITH US (PAINS)

Miten nykyiset palvelumme ovat epäsoivia sinulle? Mitkä ominaisuuksia kaipaat? Onko asioita, jotka eivät toimi tarpeisiisi nähden tarkoituksenmukaisesti, ärsyttävät sinua tai toimivat väärin?

How are the current services inadequate for you? What features do you need? Are there things that do not work appropriately for your needs, annoy you or act wrong?

9. TARPEET JA TOIVEET YLIOPISTOA KOHTAAN / NEEDS AND WISHES FOR US (GAINS)

Miten nykyiset palvelumme tai yhteistyö ilahduttavat sinua? Mistä erityisesti pidät? Millaista tehokkuutta ja laatua odotat?

How do you enjoy our current services or collaboration? What do you particularly like? What kind of efficiency and quality do you expect?

10. TARPEET JA TOIVEET YLIOPISTOA KOHTAAN / NEEDS AND WISHES FOR US (GAINS)

Mikä lisäisi todennäköisyyttäsi lisätä yhteistyötämme tai valita palvelumme?

What would increase your probability to step up co-operation with us or choose our services?

11. TARPEET JA TOIVEET YLEISELLÄ TASOLLA / NEEDS AND WISHES GENERALLY (GAINS)

Mikä voisi helpottaa työtäsi? (Tasaisempi oppimiskäyrä, enemmän tai toisentyyppisiä palveluita tai alhaisemmat omistuskustannukset?)

What would make your job easier? (A smoother learning curve, more or different types of services, or lower cost of ownership?)

12. Tähän voit jättää yhteystietosi, jos haluat vastauksesi meille tiedoksi tai toivot kahdenvälisiä keskusteluja You can leave your contact information here if you want to inform us of your response or you want bilateral discussions

Etunimi/Firstname	<input type="text"/>
Sukunimi/Surname	<input type="text"/>
Matkapuhelin/Phone	<input type="text"/>
Sähköposti/Email	<input type="text"/>

13. Vapaat kommentit Free comments

Appendix 2. Program of the workshop 2.



FREESI lab workshop: Service concept development for the Smart Grid research platform

Place: University of Vaasa, F119, Yliopistonranta 10, 65200 Vaasa
 Zoom (9:00-11:00) Join from PC, Mac, Linux, iOS or Android:
<https://uwasa.zoom.us/j/65497002627?pwd=R1lXSIBpODN4c3RSdldSNVhJZVhpdz09>
 Password: 081729

Date: 26.10.2021 klo 8:30 – 15:30

Language: oral presentations in Finnish, slides in English

This workshop relates to the development of VEBIC's FREESI laboratory and Smart Grid research activities. We are developing our service concept using co-creation methods with the help of the SGFER project funded by the Regional Council of Ostrobothnia.

PROGRAM

8:30 Registration and coffee

9:00 Opening of the event / Suvi Karirinne, VEBIC, University of Vaasa

9:15 Regional Council of Ostrobothnia's financing opportunities / Niklas Ulfvens, Regional Council of Ostrobothnia

9:30 Business Finland's financing opportunities / Tero Ijäs, Business Finland

9:45 Academia of Finland's financing opportunities / Heidi Kuusniemi, Digital Economy, University of Vaasa

10:00 Presentation of the SGFER project / Kimmo Kauhaniemi, University of Vaasa

10:15 Smart Grids and Flexible Energy Resources research

Introduction of the research teams / Hannu Laaksonen, University of Vaasa

Presentation of research activities / Kimmo Kauhaniemi, University of Vaasa

11:00-12:00 Lunch, Restaurant Mathilda

12:00 Visit to the FREESI laboratory

13:00 Workshop

14:00-14:15 Coffee

15:15 Summary of the workshop

15:30 The event ends

Side event: Free webinar at 16:30-17:30 "Electric Vehicles Charging Infrastructure and Grid Integration", see separate brochure!



Österbottens förbund
Pohjanmaan liitto

Leverage from
the EU
2014-2020



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