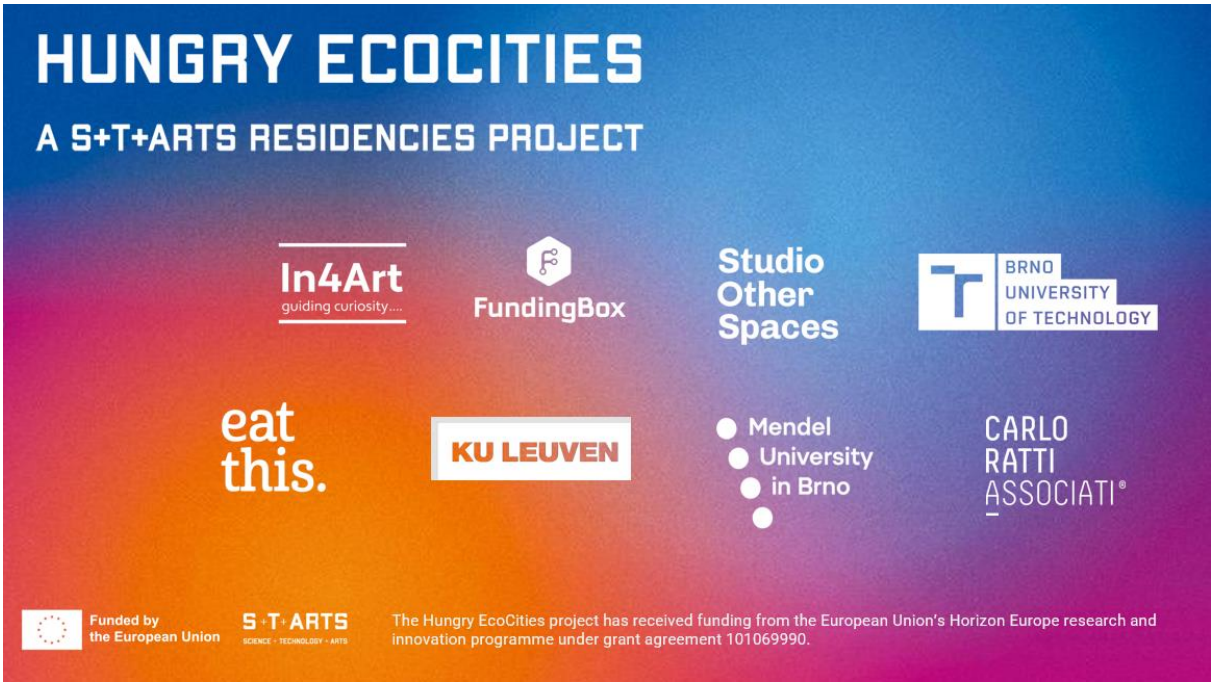

Deliverable 5.9 HEClab exploitation plan 1

Version 1.0

Grant Agreement Number	101069990
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Duration of the project	42 months
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Reviewers: Pavel Chaloupsky + Mendel University

Objective of the deliverable

An initial exploitation strategy for the HEClab platform, including a value proposition analysis and user journey.

History of changes

Date	Version	Author	Comment
13.06.24	0.1	Klara Kaluzikova	Setup of deliverable
15.08.24	0.2	Rodolfo Groenewoud van Vliet	Draft text
19.08.24	0.3	Lija Groenewoud van Vliet	Full draft
21.08.24	0.4	Pavel Smrz	Review
28.08.24	0.5	Pavel Chaloupsky	Review
30.08.24	1.0	Rodolfo Groenewoud van Vliet	Final version

Table of Content

1. Abstract

The HEClab is live! After a little more than one year of preparations, the digital laboratory for Hungry EcoCities has launched in June 2024.

The goal of the lab is to promote the adoption of digital technologies for art-driven innovation in the food system. With a focus on Technology Readiness Levels 4 to 6, the HEClab strives to bridge this gap, facilitating demonstrations, validations, and real-world applications of innovative solutions.

To achieve art-driven innovation, more is needed than artistic exploration, research and experimentation. Real world prototyping, testing, and piloting are often overlooked or not in scope. This is a missed opportunity, as many novel experiments have the potential to transfer to the ‘real world’. The HEClab is conceived to provide a place, a virtual laboratory, to empower the valorisation of art-driven experiments.

In this deliverable, which is an intermediate report, we unfold the initial value proposition and the roadmap for the HEClab within the duration of Hungry EcoCities (thus until February 2026). An updated and improved version of this plan will be delivered by the end of the project, including our plan for further exploitation and sustainability beyond the Hungry EcoCities project lifetime.

2. Needs and comparative analysis

The HEClab aims to become a web-based tool to stimulate uptake of digital technology opportunities for sustainable innovation in food.

In innovation processes, a lot of emphasis is given to the early stages of development (ergo; ideation, exploration and experimentation) and the later stages of development (ergo; business development, application and marketization). An often overlooked, but essential part of the development funnel is what lies in between: demonstrating in relevant environments, validation in operational environments and thereby completing the system, making it ready for use and replication. Facilitating these steps, on the Technology Readiness Level (TRL) scale levels 5 and 6, is the focus of the HEClab.

The HEClab is a digital tool, a virtual platform which allows for finding matches between proof-of-concept prototypes coming out of art-driven experimentation projects, and relevant operational environments to demonstrate and validate the solutions. In addition, creating windows of opportunity for demonstration and validation through funding opportunities, a database of collaborators, and a knowledge repository will make the HEClab a useful tool for those interested in art-driven experiments and looking for solutions to contribute to a more responsible and sustainable food system.

Central within the HEClab is the streamlined matchmaking process. This is a cornerstone of the value proposition for HEClab, offering significant benefits to both innovators and potential adopters. By automating the process of connecting innovative AI-enabled prototypes with relevant opportunities in the agri-food sector, HEClab offers efficiency in finding meaningful connections for both artists/innovators and SMEs/end users. Through the structured data representation by means of the prototype cards, the HEClab allows for more accurate and relevant matches based on multiple criteria. The personalized matchmaking dashboards allow for a tailored and individual experience. The HEClab is designed with the idea to be easily scalable and transferable to other domains.

To successfully transition from early-stage prototypes to useful solutions, we have analysed the market needs and opportunities, leading to various elements to consider. Below an overview:

Technical Development	Scaling up from prototype to production-ready solution
	Addressing issues of reliability, scalability, and maintainability
	Ensuring compliance with relevant standards and regulations
Validation and Refinement	Real-world testing to validate the prototype's effectiveness
	Iterative refinement based on user feedback and performance data
	Ensuring the solution addresses a genuine market need
Market Alignment	Identifying the right market segment or application for the prototype
	Adapting the solution to meet specific industry or user requirements
	Developing a clear value proposition and use case
Partnerships and Collaboration	Connecting innovators with industry partners who can provide domain expertise
	Collaborating with potential end-users to ensure relevance and usability
	Forming partnerships for manufacturing, distribution, or implementation
Funding and Resources	Securing funding to support the development process
	Access to necessary facilities, equipment, or computational resources
	Building a team with the right mix of technical and business skills
Regulatory Navigation	Understanding and addressing relevant regulatory requirements
	Obtaining necessary certifications or approvals
	Navigating intellectual property considerations
Scaling Strategy	Developing a plan for scaling production or implementation
	Identifying and addressing potential barriers to widespread adoption
	Creating a roadmap for expanding into different markets or applications
Knowledge Transfer	Translating technical innovations into language that resonates with potential adopters
	Developing documentation, training materials, and support systems
	Ensuring the solution can be effectively implemented and used by the target audience
Impact Assessment	Evaluating the potential environmental, social, and economic impacts of the solution
	Ensuring alignment with sustainability goals and ethical considerations
	Developing metrics to measure and communicate the solution's effectiveness
Ecosystem Integration	Understanding how the solution fits into the broader food system ecosystem
	Identifying and addressing integration challenges with existing systems
	Considering interoperability with other technologies or processes

Table 1: Overview of potential focus areas for HEClab

Next to these focus areas, we have conducted a comparative analysis, which highlights the following ten common types of initiatives with similarities to HEClab in the sustainable food systems space.

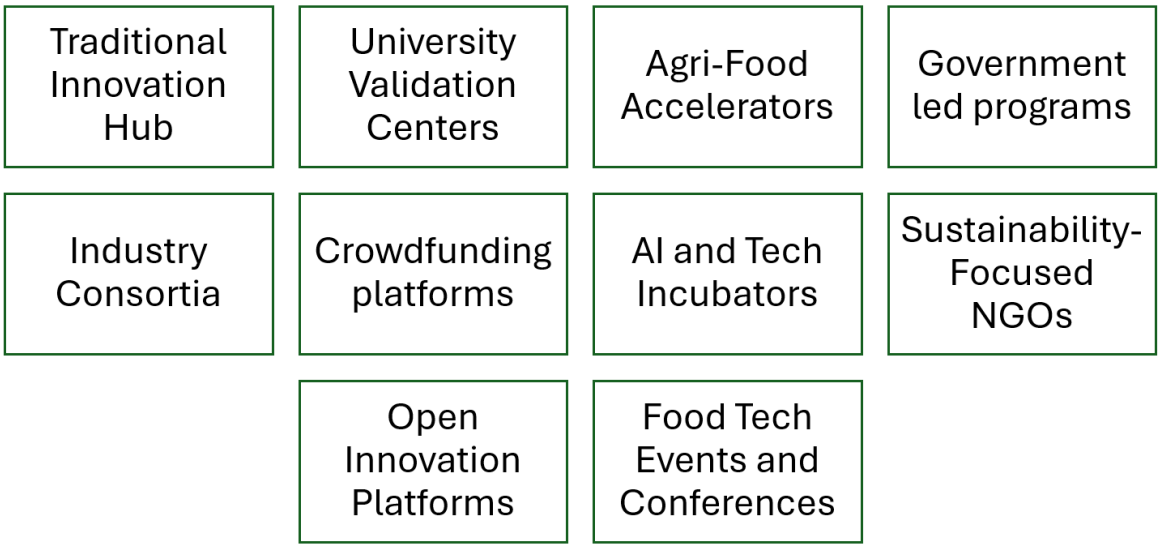


Figure 1: Outcome overview of comparable initiatives/ type of formats

For each identified comparable initiative and type of format, we describe below how it compares to the HEClab.

1. **Traditional Innovation Hubs.**
   Often physical spaces focusing on local innovation and entrepreneurship, which also offer a combination of co-working space, mentorship, and resources for food startups. They usually rely on a combination of public funding, corporate sponsorships, and membership fees.
   → HEClab is a virtual platform enabling **global connections** and collaborations, not limited by geographical constraints.
2. **University Validation Centers**[1]
   Focus on academic research and theoretical solutions, often providing facilities and expertise to validate new food products and technologies. Typically funded through the university, with additional grant money for specific projects
   → HEClab bridges the gap between research and **practical application** by connecting innovative prototypes directly with industry stakeholders.
3. **Agri-Food Accelerators**
   Typically support startups through mentorship and funding, generally take an equity stake in the startups they support, providing a potential long-term revenue source if those startups succeed.
   → HEClab focuses on matching existing prototypes with opportunities, potentially **complementing accelerator programs** by providing a platform for accelerator graduates.

[1] As found in the UBI-index: World Rankings of Business Incubators and Accelerators (ubi-global.com)

4. **Government led programs**
   Often policy-focused with broad, long-term goals, where demonstrating clear public benefit is key. Funded by taxpayer money and tend to have longer time horizons.
   → HEClab provides a direct, immediate path for innovative solutions to reach the market, **potentially informing and supporting policy initiatives**.
5. **Industry Consortia**
   Usually closed groups of established industry players, who are also the funding member companies and see value in collaborating on pre-competitive topics and shared challenges. Providing a clear ROI to members is essential.
   → HEClab is an **open** platform that includes diverse stakeholders, fostering cross-sector innovation, in particular for SMEs.
6. **Crowdfunding platforms**
   Focus on funding innovative ideas, while taking a percentage of successfully funded projects. Volume is important, as is attracting high-quality, appealing projects. Mostly raise funds from individual backers.
   ➔ HEClab goes **beyond funding** to match prototypes with practical implementation opportunities in real-life settings.
7. **AI and Tech Incubators**
   Mostly focus solely on technological innovation (and projects with commercial potential) which are often funded through a mix of public and private funding. Demonstrating a pipeline to commercialization supports fundraising efforts.
   → HEClab uniquely combines art-driven approaches with AI technology, potentially leading to **more creative and user-centric solutions**.
8. **Sustainability-Focused NGOs**
   Focus on advocacy and education, to educate and advocate for a more sustainable food system in Europe. Mostly rely on donations and grants. Compelling storytelling and demonstrable impact are crucial for attracting funders.
   → HEClab provides a practical platform for implementing sustainable solutions, **complementing advocacy efforts.**
9. **Open Innovation Platforms**[2]
   Typically focus on idea generation and problem-solving, typically charge companies to post challenges and may also take a percentage of success fees. Attracting a robust community of solvers is key.
   → HEClab specializes in matching existing prototypes with opportunities, focusing on the **later stages of the innovation process**.

[2] Examples are Home - Wazoku Crowd, Foodentrepreneurs

10. **Food Tech Events and Conferences**[3]

Provide networking, attracting the right targeted audience and knowledge sharing opportunities but are time-limited. They make money from ticket sales, sponsorships, and selling exhibition space.

→ HEClab offers continuous, algorithm-driven matchmaking, extending **beyond the limitations of event-based networking**.

When considering the revenue model for the HEClab, we will draw lessons from the strategies employed by the above comparable initiatives in the food innovation ecosystem. One key insight that emerges is the importance of diversified revenue streams. Many successful initiatives rely on a mix of funding sources, such as public funding, corporate sponsorships, membership fees, equity stakes, grants, donations or service fees. This diversification helps provide stability and resilience.

Another crucial factor is the ability to demonstrate the clear distinctive value and impact of HEClab to the stakeholders, the identified users (see next chapter). For the HEClab, a hybrid revenue model that incorporates multiple streams may offer the best path to sustainability. This could involve a combination of service fees for successful matches made through the platform, premium features or enhanced support for subscribers, corporate sponsorships or partnerships with aligned organizations and grants related to sustainable food system innovation.

We note that the costs to operate the HEClab could be lower than for comparable initiatives due to the high level of automation through AI. Platform maintenance, quality control, security updates and technical upgrades are part of this.

The key to making any of these revenue streams viable will be to build a robust pipeline of quality projects and opportunities. The HEClab must attract a critical mass and clearly communicate the unique value of its matchmaking platform. This will require a strong focus on measurable impact and a compelling value proposition.

By learning from the successes and challenges of comparable initiatives, and adapting those insights to its unique context and mission, the HEClab can craft a revenue model that supports its long-term sustainability and impact in the food innovation landscape.

[3] Examples are Food Tech Matters (UK), AgriFood Summit (Italy), Food 4 Future World Summit (Spain), F&A Next (NL)

3. Value proposition HEClab

From the above analysis, we have distilled four unique propositions that the HEClab entails. The current key differentiators of HEClab in comparison with other common initiatives in the sustainable food systems space are:

A. **Unique focus** on art-driven AI prototypes, fostering creative and interdisciplinary solutions.
B. **Specialized Matchmaking**, since tailored to connect innovative prototypes with relevant opportunities in the food system.
C. **Standardized Presentation** by asking all prototype cards to follow the same format, leading to clear, consistent communication of complex projects.
D. **Scalability potential** through its design, that supports the option for various projects within and beyond the S+T+ARTS network to add different opportunity and prototype card registers.

After assessing the elements to consider when aiming for successful transition of early-stage prototypes to useful solutions, in combination with the0 outcomes of the comparative analysis and the identification of the current differentiators that distinguish HEClab from most other initiatives (not to forget where it can complement or feed into existing initiatives), the scope for the value proposition can be further prioritized into five elements:

1. **Matchmaking for Partnerships and Collaboration**

Why: This is at the core of HEClab's functionality.
How: Enhance matchmaking algorithms to create more precise and valuable connections between innovators and industry partners.

Possible ways to test:

◊ **AI-Powered Matching**: Advanced AI algorithms that analyse both explicit (e.g., tags, short descriptions) and implicit (e.g., full text content vectorisation by means of LLM-based models, adapted on successful past matches) data to suggest highly relevant matches, with potential generated explanations why the match is suggested (for example, the prototype used another material, but the approach could be applied for the described opportunity).
  - Sophisticated algorithms that consider multiple factors (e.g., technical compatibility, market alignment, complementary skills) and improve the matching dashboard percentages
  - Continuous learning from successful and unsuccessful matches
  - Enhanced personalized dashboards for users to manage and validate proposed matches.
  - Personalized recommendations based on user behaviour and preferences
◊ **Partnership History**: Track and display successful collaborations to build trust and showcase the platform's effectiveness.

Value creation impact: accelerates the transition from prototype to practical application by connecting innovators with the right partners.

2. **Prototype Card Improvement**

Why: Bridges the gap between technical innovation and practical understanding to enhance knowledge sharing.

How: Expand on the prototype card system to include more comprehensive, yet accessible, technical documentation.

Possible ways to test:

- ◊ **Interactive Prototype Cards**: Enhance the current prototype cards with interactive elements like expandable sections, video demonstrations, and technical specifications.
- ◊ **Requested Knowledge Base**: Develop a searchable repository of food system challenges, technologies, and success stories to contextualize innovations.
- ◊ **Intuitive Search Tool**: improve the searchable knowledge base of food system challenges and technologies (cards), e.g., through adding a Food System Mapping Tool. This could be a visual tool that allows users to map where and how their prototype fits into the broader food system ecosystem.
- ◊ **Translation Tools**: Implement features that help translate technical jargon into accessible language for non-technical stakeholders to support the content writing within the card.

Value creation Impact: Facilitates better understanding and adoption of complex AI-driven solutions by potential users.

3. **Support Ecosystem Integration**

Why: Ensures innovations can be effectively implemented in real-world food systems.

How: Develop features to map how prototypes fit into broader food ecosystems.

Possible ways to test:

- ◊ **Integration Checklist**: Develop an interactive checklist that helps innovators identify potential integration challenges and opportunities for the matched opportunities.
- ◊ **Funding Opportunity tool:** Develop a module that matches specific funding opportunities for the specific cards or the combined validated match and provide insight in why this opportunity fits and is relevant.
- ◊ **Match alert:** Overview of latest additions and showcase the continuous use of the platform and extension of the ecosystem network with the newest added cards. Develop feedback system to notify on newly created automatic matches.
- ◊ **Visibility of the HEClab**: Showcase platform in the food sector, integration of prototypes from various S+T+ARTS initiatives/ Food start-ups, increasing the database.

Value creation impact: Helps stakeholders understand how new solutions can integrate with existing funding opportunities.

4. **Impact Assessment**

Why: Crucial for demonstrating the value of sustainable innovations.
How: Incorporate impact metrics
Possible ways to test:

- ◊ **Impact Prediction Model**: Develop an AI model that predicts potential environmental, social, and economic impacts based on prototype characteristics and intended application.
- ◊ **SDG Alignment Tool**: Create a feature that helps users align their innovations with specific Sustainable Development Goals and suggests metrics for measuring progress.
- ◊ **Impact Visualization**: Implement interactive graphics that visually represent the potential impacts of a prototype, making it easier for stakeholders to understand and communicate the value.

Value creation impact: ensures that innovations are directed towards real-world needs, increasing chances of successful implementation. Help quantify and communicate the potential benefits of innovations, encouraging adoption.

These elements leverage HEClab's strengths as a digital platform focused on connections and information sharing. They address critical gaps in the current innovation ecosystem, particularly in linking innovative prototypes to real-world applications. They build on HEClab's existing features (like prototype cards) while suggesting valuable expansions.

By focusing on these elements, HEClab can provide the most effective support in bridging the gap between early-stage prototypes and useful solutions in sustainable food systems.

User value of HEClab.

The HEClab register portal is built in a modular manner to accommodate for different needs and users. At the moment, we have identified the following types of users:

Prototype card register: Creative innovators (artists, designers, small-scale entrepreneurs, start-ups)

The value for a prototype card register is:

- Matches with real-life test environments and funding
- Visibility of developed prototype
- Support in follow-up actions

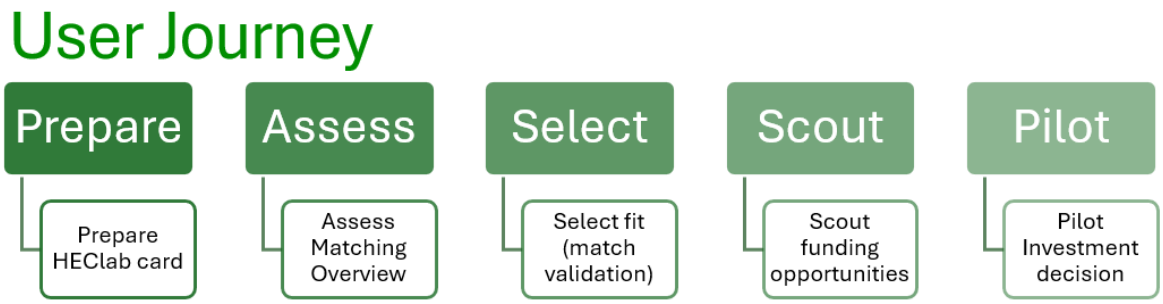


Figure 2: User journey for prototype card and Food SMEs opportunity card register

Opportunity card register: Food SMEs, looking for innovation or solutions to their problem and **Innovation calls**, offering opportunities for testing/ living labs (e.g., EU calls/cascade funding/regional/national/foundations calls).

The value for an opportunity card register is:

- high potential applicants, true insight in matching percentages, providing a higher chance of successful selection
- access to the database with prototypes in need of your testing facilities
- inspiration from food innovation developments
- support in framing the food challenge

User Journey for Food Innovation Calls			
Identify Pilot Call/ Living Lab (TRL 4 – TRL6)	Add to funding opportunities	Matching with high potential applicants	Input for pre-selection/ targeted dissemination

Table 2: adjusted user journey for specific Food innovation Call register

The innovation space in which we want to support with effective matchmaking, targeting those prototype that have reached TRL 4, but still need much development and testing before being ready to offer to the market/ society, is a field of high risk and uncertainty, due to the complex challenges at hand. This means, that also the registers of HEClab will need follow up investment to reach the anticipated TRL 6 or further to support their pilot test. Within the HEClab, we want to support this with a funding opportunity tool. This also has implications for the impact and revenue model of the

HEClab – we can make successful matches, support in the pilot plan and give access to the database and network, but the actual investment and work on further development in the pilot is something that takes place outside of the HEClab.

Therefore, we need to explore a hybrid revenue model, of which we first validate the following options:
> Freemium model: adding prototype, but paying for support in matching funding opportunities
> Pay per Opportunity Card
> Matching fee to run a project on the platform
> Donations for successful matches
> Consulting fee for services to add new register types

To keep the HEClab operational, revenues are needed to cover the running costs of the platform, consisting of:
> maintenance of the platform
> platform and AI running costs
> validation of the prototype card to ensure quality
> service to support writing opportunity cards

The costs will depend on the right product-market fit that we identify for HEClab, and consequently the services and model it will provide. We are also considering possible "exit" strategies for the HEClab, 1) as a stand-alone SAAS solution product, 2) as a tool for consulting firms to enhance their offering 3) as a platform for e.g., Chambers of Commerce/ Cluster organisations to offer to their members.

4. HEClab exploitation

The intention is to establish HEClab as a specialized matchmaking platform and gradually evolve into a comprehensive ecosystem for driving sustainable innovation, positioning itself as an indispensable tool in the global effort to create more responsible and sustainable food systems.

Within the time scope of Hungry EcoCities (coming 18 months), HEClab will focus on creating value from streamlined matching between the art-driven innovation prototypes and the SMEs, part of Hungry EcoCities. In addition, we will use the validation period with our artists and SMEs to improve the matchmaking process, showcase the platform, improve the usability of the features and improve the existing features while planning for additional features. We will also reach out to other initiatives and projects[4] to offer and test the HEClab for their matchmaking, whether they add opportunities or prototype cards, so that the HEClab by the end of Hungry EcoCities will become a

[4] We have already established contact and are in dialogue with Sustainable Food Platform, European Food Information Council (EUFIC), and Food2030

repository of available prototypes for food system innovations and we have validated the various functionalities and value propositions.

Key takeaways on the revenue model include the importance of engaging with other European funded projects, coming from funding such as Horizon Europe and the CBE JU, and participating in continent-spanning networks like EIT Food for inspiration and potential partnerships. The analysis also highlights the potential to learn from and collaborate with leading food innovation hubs, accelerators, and platforms across various European countries. This will also support us in defining the HEClab's own sustainability strategy within this regional context.

For the HEClab, a hybrid revenue model with multiple streams may provide the most stability and sustainability. The key will be to clearly demonstrate the unique value the HEClab provides to creative innovators and SMEs/ Innovation Call managers, and to build a robust pipeline of quality prototypes and opportunities. A focus on measurable impact will be important for attracting both users and funders.

5. Reflections & Lessons Learned

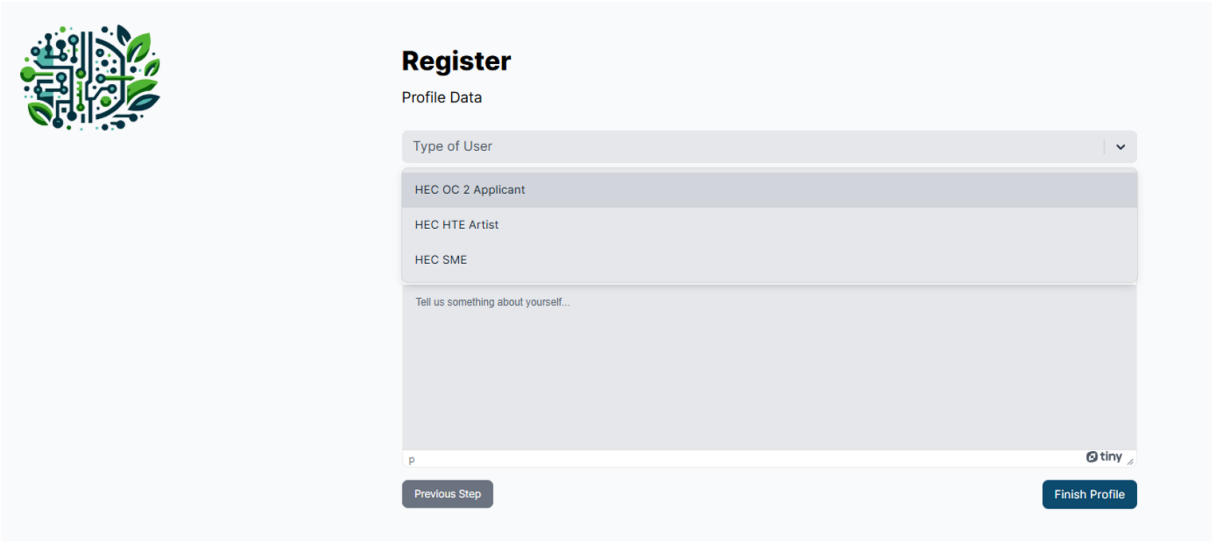
The HEClab was brought into the scope of this project to serve objective #2: stimulating the uptake of digital technologies across the agricultural sector. In the original project plan, we foresaw to use the HEClab mainly as a repository of project results and meeting place for like-minded innovators from various disciplines. However, over the course of the project, our ambitions have increased, now aiming to develop the HEClab as a specialized matchmaking platform to drive sustainable innovation in the agri-food sectors. This evolvement of the ambition has led to a lot of additional energy amongst project partners and contributors as the promise of the HEClab for them has increased.

Now that the HEClab is finally live, we have started working with it, beginning with the addition of the prototype cards from the Humanizing Technology Experiments. This process went well, and we believe the structured and standardized card system will have value in communicating complex projects and inventive results to a large audience in this way. Right after the submission of this deliverable, in September, we will start stage 2 of using the HEClab by adding the opportunity cards developed with the SMEs of the Paths to Progress experiments. This will be another exciting step for the HEClab, and we look forward to learning from this process.

Meanwhile, artists applying to the open call for artists stage 2 have been asked to propose prototype cards on the HEClab as well. Although they are requested to follow the same procedure as the artists from the Humanizing Tech Experiments, they will have to do so without the direct support and instructions from the HEC team. It will be interesting to see how artists from the outside perceive the system and its usability and we expect to learn a lot on the user friendliness, strengths and weaknesses in this process.

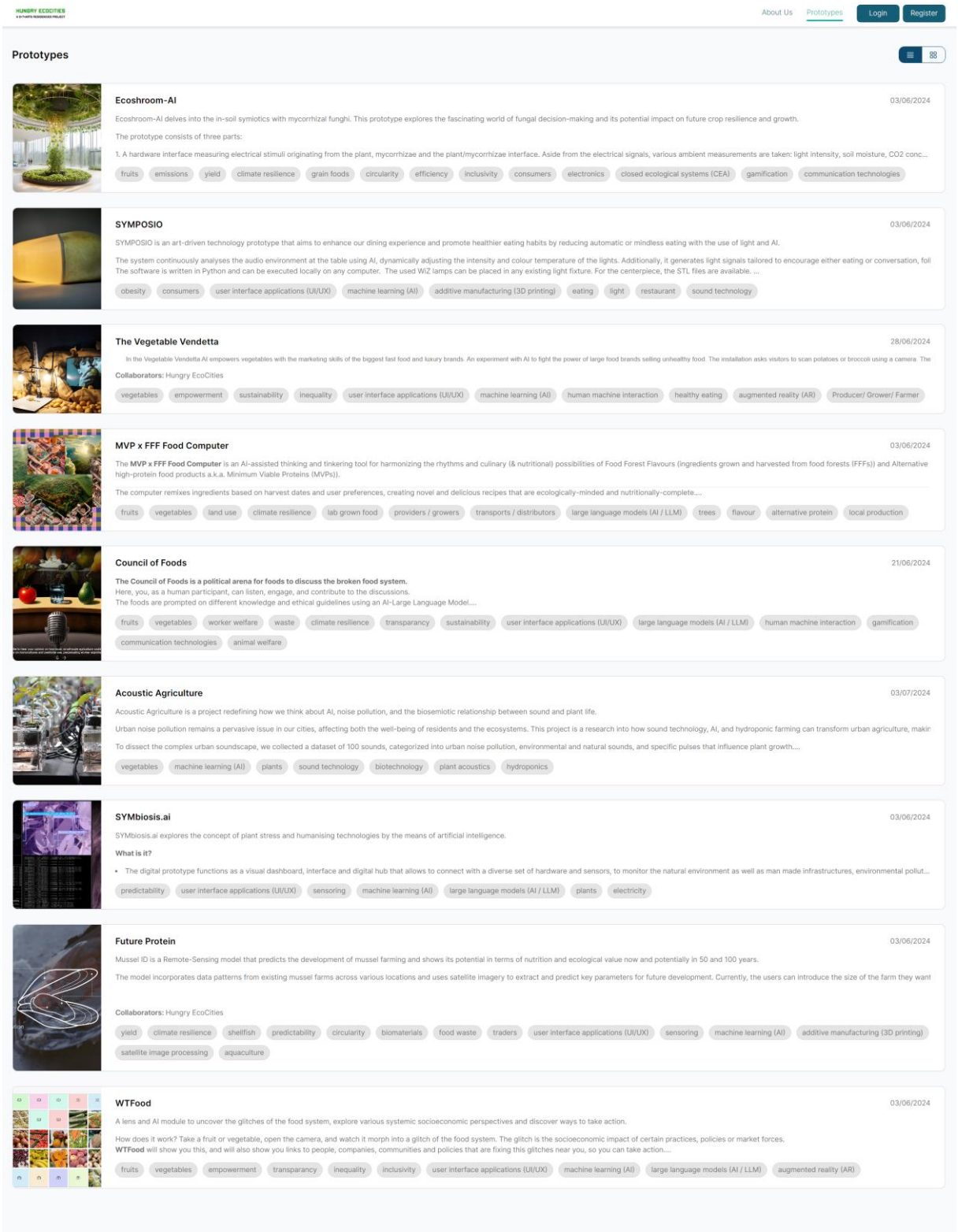
Annex 1 – HEClab Register options

Screenshot of the current different register profiles on the HEClab



Annex 2 – Overview HEClab prototype cards

Screenshot of the current HEClab list of available prototype cards.



About Hungry EcoCities

Funded by the European Union

S+T+ARTS
SCIENCE + TECHNOLOGY + ARTS

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Hungry EcoCities aims to explore one of the most pressing challenges of our times: the need for a more healthy, sustainable, responsible, and affordable agri-food system for all enabled by AI. More info: starts.eu/hungryecocities.nl