Final Evaluation report for the Skylab Pilots Program

Executive summary

The DTU Skylab Pilots program aims to establish technology partnerships between startups, SMEs, and knowledge environments to drive innovation in Denmark. The program supports 15 technology partnerships over three years, accelerating the development of 30 companies. The goal is to demonstrate solutions to participating companies and potential customers, enabling the faster development of startups, bringing new technology to Danish SMEs, and developing the talent pool for the labor market. The program utilizes DTU Skylab's resources and involves students as key contributors. The insights and knowledge generated from the program will be synthesized into a generalizable model for application in other parts of the Danish innovation environment. The DTU Skylab Pilots program has shown the importance of technology partnerships in fostering innovation. The collaboration between startups, SMEs, and knowledge environments, facilitated by competent project managers, has resulted in significant achievements. The program's impact on startups, SMEs, and DTU students highlights the value of such initiatives in driving technological advancements and developing the talent pool. By addressing key lessons learned and leveraging the insights gained, the program has the potential to be replicated in other parts of Denmark's innovation ecosystem, benefiting stakeholders across the country.

Key findings and achievements:

- Startups and SMEs shared common features and achieved progress after participating in the Pilot program.
- Startups benefited from DTU's brand name, learned to collaborate with departments and researchers, and received contributions from students.
- SMEs learned to work with Skylab, enhanced confidence in business success, and continued support for startups.
- DTU students made significant contributions to the program, enhancing their competencies, and developing professional networks.
- Program management, the use of the physical space at Skylab, and understanding of DTU's complex organization were key success factors.

Key recommendations:

- Strengthen the role of project managers as active facilitators, with engineering, manufacturing, and market competencies, to ensure successful collaborations and matchmaking.
- Improve the utilization of physical space and facilities at Skylab, addressing issues such as tool availability and disturbance from visitors.
- Enhance the understanding of DTU's complex organization among startups and SMEs, providing training to program managers to effectively navigate collaboration opportunities.

- Foster collaboration between startups, SMEs, and DTU professors by leveraging student projects, providing program managers with knowledge on academic staff engagement and evaluation.
- Keep on providing freedom and space to startups to pursue the needs specific to their company, instead of imposing unrealistic project milestones and unnecessary administrative paperwork.
- Consider “speed dating” among several startups and SMEs in the early phase of the program as a complementary means to a fixed 1:1 matchmaking.

Acknowledgement

The authors of this report acknowledge the invaluable inputs from the project manager Søren Ammundsen, Christian Woergaard, Kim Schølte, the startup founders and the SMEs’ managers, and the Skylab leadership team. We also thank student assistant, Frederik Carlsson, for his work supporting data collection. Special thanks are given to the Danish Industriens Fond for its funding support to the Pilots Program.

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Version completed on 06-11-2023

Project overview

DTU Skylab—that is DTU's innovation house—has launched the programme *DTU Skylab Pilots*, which aims at developing a validated model that supports innovative technology partnerships that can create ground-breaking solutions addressing the needs of industry and society. Over a three-year period, the project will support 15 unique technology partnerships, accelerating the technology development of 30 companies (15 startups and 15 SMEs). The aim of the project is to accelerate technology projects to a stage where their solutions can be demonstrated to the participating companies and potential customers. As such, the project will provide the space for faster and better startup development for the next generation of startups, will bring new technology into play among Danish SMEs, and will develop the talent pool for the Danish labour market. The Skylab Pilot program has been experimenting with new partnerships between SMEs and startups that can combine production experience and industry know-how with creativity and agility. DTU Skylab's physical facilities, dynamic innovation environment and staff are the unique resources in the program, which also involve DTU students and researchers as a significant development force in the individual projects.

The insights and the knowledge generated from the program will be summarized and synthesized into a generalizable model that can be applied to other parts of the Danish innovation environment, benefiting other regional innovation/entrepreneurship ecosystems. This model will help establish similar collaborations among technology startups and SMEs, along with the support of students and university researchers. Establishing technology partnerships between startups, established SMEs and knowledge environments (e.g., universities, involving students and faculty) is the right formula to benefit all relevant parties.

This final evaluation report is conducted by researchers at DTU Centre for Technology Entrepreneurship, based on various data inputs collected from the beginning of the Pilot program to date. The aim of this research-based report is to objectively present the effect of the program on key stakeholders, including the startups, SMEs, DTU students, and DTU Skylab project managers. The insights provided in this report serves multiple purposes: (1) it can be used by Skylab Pilot project managers to learn valuable lessons from prior practices and improve their support to the future collaboration projects between startups and SMEs; (2) the data collected and analyzed at this point can be stored and used as benchmark for the next phase of the Pilot program; (3) important lessons can be learned and recommendations are made for future versions of the Pilot program.

Corporate (SMEs)-Startups-University collaboration: State of the Art

The Pilots Program builds on a solid theoretical foundation on university-industry collaboration, specifically on innovation intermediaries, corporate-startup collaboration, and SME-startup collaboration. A brief overview of the knowledge and wisdom derived from extant literature is summarized below.

1. University-industry collaboration

University-industry collaboration (UIC) will provide industrial firms with additional external R&D capacity and reduce transaction costs if managed properly (Ahrweiler et al., 2011; Perkman et al., 2013; Wang and Li-Ying, 2015). Danish research policy actively promotes the impact of university-industry collaboration, with evidence suggesting that enterprises (with R&D functions) collaborating with a Danish university have an annual productivity growth rate of 3.5% on average, while similar enterprises without university

collaborations have a significantly lower average productivity growth rate of 0.9% (Danish Agency for Research and Education, 2017). However, UIC is not straightforward, as it requires dedicated resources and careful management to remove or mitigate any potential barriers occurring from the interaction between scientific staff and people from industry. Therefore, innovation intermediary functions/mechanisms are often needed to facilitate UIC. DTU Skylab can be seen as an intermediary organization as such, and the Pilots project is a particular platform that intermediates the collaborative relationships among start-ups, SMEs, students, and scientific staff at DTU.

2. Innovation Intermediaries

Innovation intermediaries facilitate inter-organizational collaboration bringing together firms, governments, and universities to address innovation-related challenges, promote entrepreneurship, and foster economic development. The variety of tasks performed by these organizations and initiatives, such as the Skylab Pilots, aims at addressing the challenges in the innovation and entrepreneurship process, such as i) partner matchmaking, ii) bridging innovation, technology, and information gap, and iii) executing different norms and networking paradigms. The value of intermediary organizations to their network participants extends beyond knowledge brokering activities into broader systemic innovation and entrepreneurship (Howells, 2006; Kilelu et al., 2011). The increasingly unknown and undefined situations that intermediaries face when supporting the innovation process of their network participants give rise to higher complexity in their roles and activities (Agogué et al., 2017). Thus, it is necessary to assess how the Skylab Pilot has performed its intermediary functions to support its partners, members, and other stakeholders in its extended network.

3. Corporate-startup collaboration

In their effort to find new sources of digital innovation, an increasing number of large corporations have been seeking to collaborate with startups. According to Weiblen and Chesbrough (2015), there are at least four types of CSC. First, *corporate venturing* requires equity involvement of the large corporate in the startup while the innovation comes outside-in. Second, *corporate incubators* involve equity investment, but the flow of innovation is inside-out from the corporate's point of view. Third, the *outside-in startup program* does not involve equity investment but insources and facilitates startups to work with the corporates to further develop their technologies and market. In this type, sometimes the startups are invited to collaborate with the corporate with a clear goal of incubating these startups as key suppliers (Kurpjuweit and Wagner, 2020). Skylab Pilot resembles the most this type of CSC but with some unique features, as the "corporates" in the projects are SMEs, instead of large corporates. Last, *startup programs as a platform* are used to spur complementary external innovation to push an existing corporate innovation, where equity investment is not used.

4. SME-startup collaboration: challenges and opportunities from both sides

SMEs have been active in practicing open innovation, meaning exploiting the value of their current knowledge and technologies, while exploring external collaboration to acquire missing knowledge, complementary resources, to spread risks, to enlarge their social networks, or to reduce costs (Van den Vrande et al., 2009). Van den Vrande et al. (2009) found that the strongest motivation of SMEs to do so is to keep up with current market developments, develop customers and increase their growth and/or market share. On the other side, the strongest barriers identified are the associated bureaucracy and administrative burdens, (lack of) quality of partners, balancing innovation with daily tasks, and the

mismatch of market demand with the solution offered (either the demand is too specific or market demand hard to identify). While established SMEs operate in mature markets with known business models, startups are instead still seeking a business model and operate in a search mode, turning unknowns into knowns. Prior to market entry, startups are unaware of whether their ideas will work. It is about trial and error in situations of extreme uncertainty, seeking a feasible value proposition and a repeatable and scalable business model. Startups can experiment with different approaches, enabling them to respond with agility to shifting needs. The contrast between the challenges facing SMEs and startups creates opportunities for them to collaborate utilizing different forms of open innovation practices. However, to date, there has been little evidence-based knowledge to draw upon and best practices of SMEs-startup collaborations are difficult to identify.

A few initiatives around the world have been trying to connect SMEs and startups based on university-based innovation platforms. For instance, Anglia Ruskin University (ARU) in Cambridge, UK, offers innovation vouchers for SMEs that need access to university's R&D facilities, knowledge, and network, and offers proof of concept (POC) vouchers to startups that need to develop new business ideas. Meanwhile, ARU uses the Knowledge Transfer Partnership (KTP) program to employ an ARU graduate student by an SME, so that ARU's research expertise and a collection of POC opportunities can be connected with the employer SME's needs and the graduate student can implement concrete tasks within the KTP framework. However, the aforementioned programs do not bring together at the same time SMEs, startups, the university, and students into a collaborative innovation platform. In contrast to these known programs organized elsewhere, DTU Skylab Pilots program provides a platform for the simultaneous interaction of all these key actors. This end-term report is to make an assessment of the impact of the Pilots program for all key relevant stakeholders and derives key lessons for future development.

Pilot Methodology

To be able to assess the project and develop a replicable model for future use in a Danish or international context, the research team followed the development of each startup-SME project as well as the Skylab Pilots program as a whole at several points in time. To do so, the researcher team collected data from several stakeholders:

- the founders of the participating startups
- the SMEs that are matched with the startups
- the students that work with the startups
- the project management team that selects the cases, facilitates the matchmaking between startups and SMEs, and provides continuous support and resources to the startups.

Data collection

To have a rounded understanding of the Pilot program and its participants, we used several data collection techniques, such as semi-structured and unstructured interviews, surveys, participant observation, and data provided by the project managers. Data collection has been taking place as an ongoing process for each startup-SME project and for the project as a whole.

Startup-SME project level observations

At the beginning of each startup-SME project, the project managers provided the research team with the **project log data** that briefly describes the startups' and the SME's background information and the intent of their collaboration. Additionally, the project managers performed the **KTH (Innovation Readiness Level)**

IRL assessment to keep track of the initial status of the startup's innovation in comparison with its developed status after the Pilot Program. The KTH IRL is a framework for guiding idea development and assessing startup idea status across six key dimensions, including customer, technology, funding, team, business model and Intellectual Property Rights (IPR). It provides structure and support for idea owners, coaches and managers in turning an early-stage idea into an innovation in the market. The KTH IRL has been widely used in innovation and entrepreneurship ecosystems in many countries around the world.

The research team also performed **semi-structured interviews** with the startup founders and the SMEs. During the interviews, the researchers asked interviewees questions about the foundation of the startups, the intention for collaborating with the SMEs, and the reason for participating in the Pilot project and their track record of collaborations.

During the project, the researchers made frequent visits at the Skylab's Developer Hall, where the startups are located, and had informal **ad-hoc discussions** with the founders and students that work with the startups. Notes based on these discussions and observations are kept. As described below, updates on the startup-SME cases were done during the monthly lunch meetings.

At the completion of each startup project, through **semi-structured interviews** both with the startup and the SMEs**,** the research team sought to capture their experience with the Pilot program, such as the learnings of the participating firms, the benefits and obstacles of being part of the Pilots program, the communication among the different stakeholders, and the satisfaction of startups with the provided physical space and other resources. The project managers filled in the **KTH IRL assessment** at the completion of each project. Finally, a **short online survey** with open-ended and closed-ended questions was sent to the students who worked at a startup to capture and assess their experience with the project and their learnings.

Pilot-Program level observations

The project managers organized **monthly lunch meetings**, during which each startup made short updates on their progress and the project managers announced any development at the project level. The researchers kept notes on the updates and observed the interactions among the project managers and the startups. Furthermore, the research team held **biweekly project status meetings** with the project managers and conducted unstructured interviews with them to get to know about the overall developments of the project, the learnings of the project managers, and the difficulties they may experience. Table 1 below provides an overview of the data collection techniques, when they were used, and which stakeholders were involved.

Table 1. Data collection techniques: Timing and Stakeholders

Data collection techniques	Timing	Stakeholders
Startup-SME project level		
Semi-structured interviews	Beginning of each startup-SME project, end of each startup-SME project	Startup founders, SME, researchers
Project log data	Beginning of each startup-SME project	Provided by project managers
KTH IRL Assessment	Beginning of each startup-SME project, end of each startup-SME project	Provided by project managers
Ad-hoc discussions	During each startup-SME project	Startup founders, students, researchers
Student survey	At the completion of the collaboration between a student and the startup	Students, researchers

Pilot Program level		
Monthly lunch meetings – participant observation	Monthly	Startup founders, project managers, researchers
Project status meetings – unstructured interviews	Biweekly	Project managers, researchers

In the next section, the overall impact of Skylab Pilot program on relevant stakeholders will be described and explained case by case.

Performance evaluation of Startup-SME cases

1. AgriRobot and Thorsen-Teknik

	Startup	SME
Company	**AgriRobot ApS** CVR-Nr. 42412899 Kongevejen 120B 2830 Virum	**Thorsen-Teknik A/S** CVR-Nr. 36930764 Søndergården 32 9640 Farsø
Established year	May 21, 2021	June 22, 2015

Project background

AgriRobot is a startup with expert knowledge of autonomous vehicles and related technologies. They have identified a business opportunity in the field of providing certified safety solutions for autonomous agricultural machines. Thorsen-Teknik is an established business within the field of developing and marketing digital and electronic control solutions for agricultural machines.

AgriRobot had the idea to develop and integrate a certified safety solution specifically for agricultural robots. Nowadays, all autonomous agricultural machines require an operator to always travel with the machine. This is, in some way, contradictory to the purpose of autonomous machines. If a certifiable safety solution could be developed, it would mean that there was no longer a requirement for an operator—that would entail considerable savings in the agricultural sector. Thorsen-Teknik specializes in developing digital control systems for agricultural machines and they supply the digital framework/interface that AgriRobot's safety solution must work with.

The Pilots project consisted of the AgriRobot team (working in Skylab's Developer Hall) developing and testing their hardware and software on an actual agriculture machine. The Skylab program has helped to recruit students and provide advice on relevant engineering topics. The project aimed to assist AgriRobot in the development and testing of their solution. Through the Pilots project, the SME (Thorsen-Teknik) aimed to be among the first companies to offer their control solutions with certified safety functionality. After the initial meetings and explaining what the Pilots project potentially could offer, AgriRobot provided detailed tasks, covering different disciplines that students could engage in.

Project progress

Before starting the Pilot project, **Thorsen-Teknik** had little experience in collaborating with universities and other public organizations. Thus, the main goal for the company to join the Pilots program was to set up partnerships with DTU and tech startups, so that their own R&D expenses could be reduced through these collaborations. Due to the limited resources that characterize SMEs, Thorsen-Teknik would not be able to develop the knowledge alone. The company had a market-driven R&D process that was to look at what the market needs and then invest in R&D to address an identified market opportunity. In Thorsen-

Teknik's view, a strong mutual trust was crucial for establishing a partnership between a startup and an SME. Having DTU as an intermediary helped to a great extent establish a solid ground of initial mutual trust between AgriRobot and them. Thorsen-Teknik was aware of alternative technologies that could achieve the same ends for automation in the farming industry and undertook the role to advise the startup accordingly.

The founders of **AgriRobot** have had experience in collaborating with DTU in the past and were strongly motivated to join DTU Pilots because of the opportunity to get closer collaboration with DTU. Working with DTU and at DTU would not only give them access to knowledge, but also access to an extended network. AgriRobot was very confident about the market potential and positive about future success, because they considered the market "huge" and accessible, and their solution novel with the potential to disrupt the existing market. However, the founders of AgriRobot seemed to lack a complete and accurate picture of the competitive landscape. Compared to any incumbents in the market, AgriRobot believed that they would have the advantage of being agile and moving fast. However, how exactly the company should enter the market was unclear to the founders and a learning-by-doing (effectuation) process was to be adopted.

At the end of the Pilot project, the collaborative project made significant progress. The companies also reflected their experience. **Thorsen-Teknik** managed to get access to know-how and people beyond their existing knowledge base and network. It also benefitted from a dedicated DTU student, to whom the company gave direct access and assigned a dedicated employee to communicate with. The company learned how to navigate DTU Skylab and DTU and became more interested in the opportunities that the DTU innovation ecosystem could offer, including access to a large pool of talented students. Thorsen-Teknik admitted that things did not go as smoothly as initially expected, because of the unanticipated delay in helping AgriRobot to develop their solution due to material shortage during the COVID lockdown period. However, they believe that the project has achieved significant progress overall.

From their side, **AgriRobot**agreed that the project made significant progress and were happy about still being on the right track, even though the project content ended up being more complicated than originally planned. With the contribution of several DTU students, AgriRobot made big steps forward towards learning how to control the vehicle. During this process, AgriRobot learned to work with different formats of student projects (e.g., internships, paid jobs, special course, and thesis projects) and how to incentivize DTU students accordingly. There was no guideline on this at DTU Skylab for the startups, but it was a rather trial-error learning. AgriRobot clearly recognized the important contribution of DTU students and were, in general, satisfied with the quality of student work. This significantly reduced the R&D expenses of the startup.

Another key benefit of being part of the Pilot project is the brand recognition of being associated with DTU. This has added credit to the startup, making it more trustworthy and interesting in the eyes of potential investors and marketers. AgriRobot also appreciated the facilities at Skylab and the tools provided in the Development Hall, although a certain level of concern has been expressed regarding the way that the Developer Hall was managed, as sometimes tools were not available, and their work was disturbed when Skylab hosted visitors. AgriRobot also benefited from informal knowledge sharing with other startups in the Pilot projects at the Developer Hall. By the end of the Pilot project, the startup founders were still very confident in the future success of their startup and considered moving to FutureBox as the next step in their entrepreneurial journey. The companies reflected that the difference between the Pilot project (focusing on technology development) and the accelerator at FutureBox (focusing more on market development) are complementary, so that a startup might start at one place

and move on to the other, or participate in both simultaneously, although the latter could be very demanding and challenging for a startup.

A summary of key achievements or progress of the companies at the end of the Pilot project are:

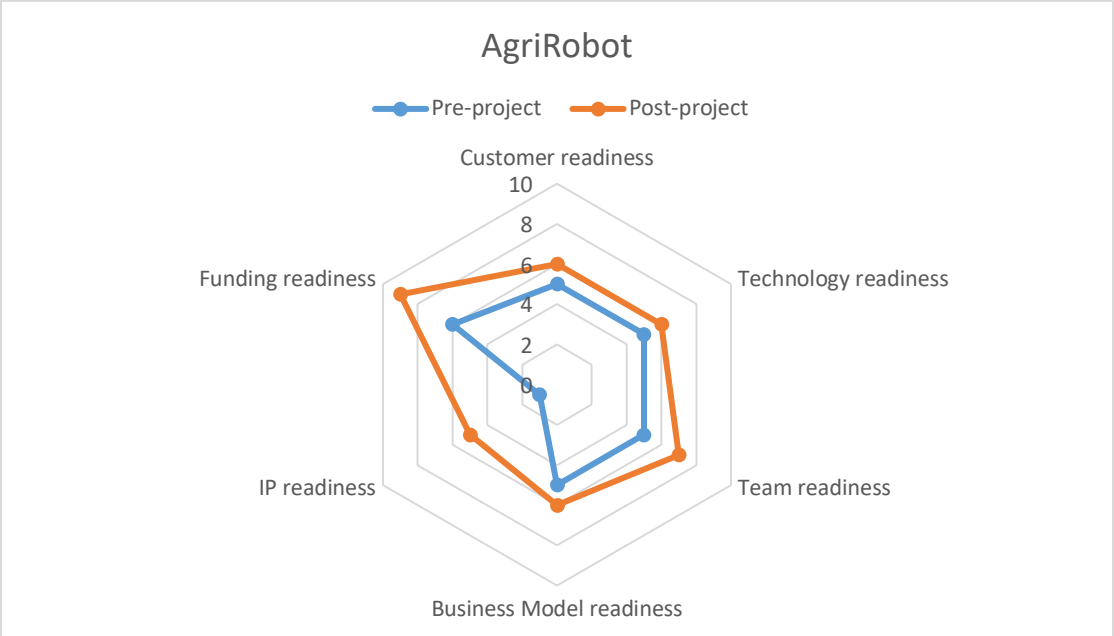
AgriRobot

- Draw upon DTU's brand name to attract attention from investors and market
- How to work with students at DTU
- Students significantly contributed to the project progress
- Knowledge spillover through informal communication with other Pilot companies
- Develop the startup to a next phase, for instance, connected to another DTU project (e.g., FutureBox or external program)

Thorsen-Teknik

- Learned how to work with Skylab and look for new project opportunities
- Enhanced confidence of its own business success

The startup's innovation was assessed before and after the Pilot project, using the KTH IRL framework, to display visible development progress. The result is shown in the figure below. The areas that the startup has progressed the most were IP readiness and funding readiness, while technology readiness, business model, and customer readiness have not been developed much.



2. Coastgrass and SPT Vilecon

	Startup	SME

Company	**Coastgrass ApS** CVR-Nr. 42135747 Frederiksholms Kanal 30 1220 København K	**SPT Vilecon A/S** CVR-Nr. 39510693 Baldersbuen 2, Baldersbrønde 2640 Hedehusene
Established	February 17, 2021	December 18, 2015

Project background

Coastgrass is a startup that has developed a biopolymer. SPT Vilecon (hereinafter "SPT") is an established R&D agency and sub-contractor within injection molding and everything related to polymers (especially Medtech). Coastgrass has an order from a customer for an injection molded part and SPT will help them develop tooling and manufacture. There has been a high level of uncertainty related to the polymer from Coastgrass, as it is not very well documented (properties etc.). This makes it difficult for SPT to ensure the required product quality. The project will document the entire process,thereby giving Coastgrass a lot of experience and reducing the cost of the order. SPT would get experience with collaborating and leveraging a good relation to DTU to be able to collaborate on future projects and recruit new employees from the students at DTU.

The startup was on a shortlist provided by DTU-Link at DTU Risø campus. Coastgrass was highlighted as a particularly interesting startup. Coastgrass agreed to provide a list of possible projects, including examples of potential SME partners. The Skylab Pilots program team performed a screening of the suggested SME's and did a background check to see if they fit the project suggestions from the startup. SPT agreed to participate in Pilots.

Having decided to focus on helping the startup gather experience and know-how on overcoming technical challenges with respect to their material, the Pilots project team initiated a dialogue with SPT regarding the scope and content of the project. SPT was able to quantify the individual tasks that needed to be done in the project, for them to be able to manufacture and ensure the quality of the end-product for the startup. The scope and content of the project was in this case defined by SPT, leveraging their expertise in the field.

Project progress

Before starting the Pilot project, **SPT** had experience in collaborating with Futurebox at DTU and Danish Technology Challenge (DTC), through which it learned about the Green Hub. The company had experience in working with different kinds of startup, some privately owned and some spinning out from big companies, while others were out of universities (e.g., Aarhus University). The company specialized in mechanical engineering and production, especially in injection molding and the different parameters that can be tuned to production. From the collaboration with CoastGrass, SPT was expecting to gain knowledge about green polymers and insights into new biopolymers. This learning benefit has been the key objective for SPT to join the Pilots program. Meanwhile, SPT was also eager to work with DTU students and access young talents to inject new ideas to the company. SPT had never expected high monetary benefits from this collaboration. SPT considered the collaboration a win-win-win situation, as it could give their real-life knowledge to the startup and DTU students, while Coastgrass could get faster to market. SPT estimated committing about 20% of their competencies into the project and was very confident that the result would be positive in terms of finding a successful application of the biopolymer. As a long-term goal, SPT wanted to create new opportunties to work in Denmark. **Coastgrass** was particularly interested in finding a partner to help with injection modeling as a production method and learn the limits of their material. The end goal was to have a portfolio of product applications for the new polymer. The company had a collaboration with the Danish Technology Institute at the very early stage but found SPT more specialized.

CoastGrass was hoping to patent the polymer material, but not the application. The target markets could be Denmark, Germany, and England. Having partners as SPT would allow CoastGrass to focus on startup activities, instead of investing in production. The startup was very confident in finding a market application, and success was defined by the startup as finding out the limitation of the new polymer compound.

At the end of the Pilot project, **SPT** found the project motivating to work with the startup, which inspired the established company. Attracting young talent was an obvious objective for SPT. However, during the COVID-19 period, global supply chain problem caused huge pressures for STP, which eventually did not manage to fully commit to the project with Coastgrass. The lack of funding was another obstacle, where the startup needed to move fast. As complexity was high and prices for mass production were unknown for Coastgrass, SPT provided relevant knowledge. However, since the molding technology provided by SPT was too expensive for Coastgrass, the startup searched for much cheaper solutions from China. This also resulted in diminishing the communication between SPT and Coastgrass during the project. SPT was always keen on helping Danish startups and scaleups, and expressed the clear message that they would like to be involved in similar programs at DTU again. This is to some extent due to the fact that SPT has an open-minded and passion-driven CEO, who was always open for new collaborations with startups.

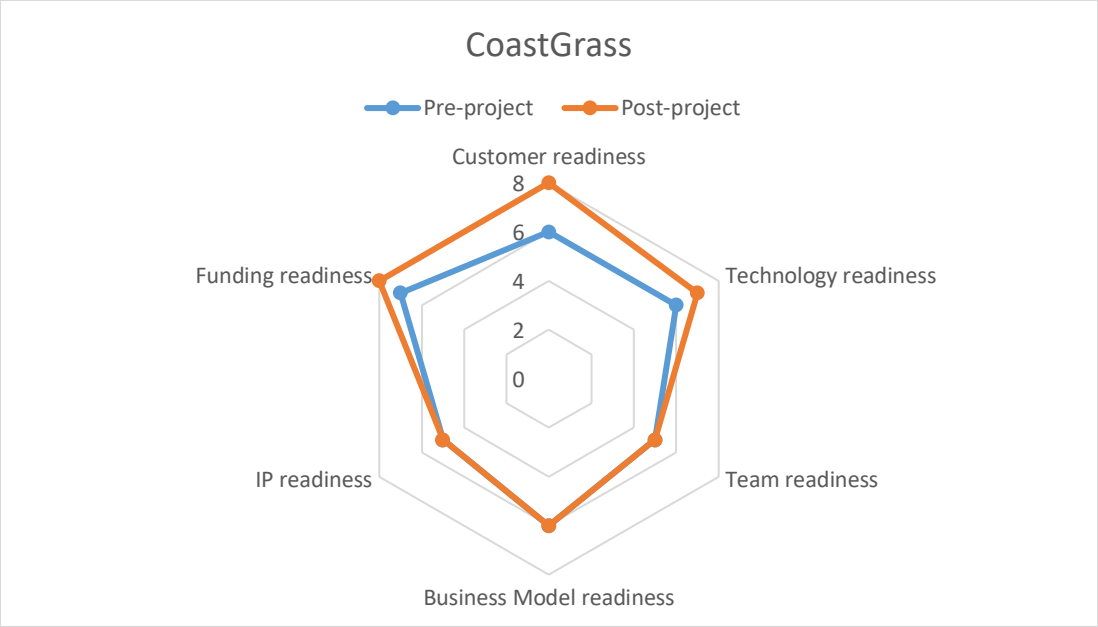
Coastgrass, on the other hand, learned a great deal in this project. First, it learned about how to collaborate within DTU by understanding how to navigate the local ecosystem, relevant DTU departments and researchers--that was not an easy task. As the startup needed to move fast, it **took** actions to connect with multiple partners outside of DTU simultaneously. It also found that the knowledge gap between industry (that normally moves faster) vs. the university (slow) is huge. Nevertheless, CoastGrass learned a lot from DTU by getting free resources and help from passionate people at DTU (e.g., professors, PhDs). Coastgrass did not spent much time at Skylab Developer Hall, but at DTU Ballerup campus instead, because Skylab did not have capacity for injection molding. The startup reflected that it did not understand the need to have a fixed place at Skylab. This somehow resulted in ineffective communication with SPT. GoastGrass also got the InnoBooster grant during the project. CoastGrass was involved in parallel with GreenDeal (Futurebox), which was found complementary to the Pilots program.

A summary of key achievements or progress of the companies at the end of the Pilots project are:

Coastgrass

- Learned how to work with students at DTU
- Students significantly contributed to the project progress
- Developed the startup to a next phase, connected to another DTU project (e.g., FutureBox or external program)
- Developed the startup by connecting to partners outside of DTU
- Receiving other startup grants

The startup's innovation was assessed before and after the Pilot project, using the KTH IRL framework, to display visible development progress. The result is shown in the figure below. The area that the startup has progressed the most was customer readiness, while business model readiness has not been developed further.



3. Vulcur MedTech and MyBlueLabel Compliance Services ApS

	Startup	SME
Company	**VulCur MedTech ApS** CVR-Nr. 39766612 Søndervigvej 50 2720 Vanløse	**MyBlueLabel Compliance Services ApS** CVR-Nr. 39341735 Agern Alle 24 2970 Hørsholm
Established	August 1, 2018	February 5, 2018

Project background

VulCur MedTech is a startup that has developed a robot-mounted laser for treating wounds in diabetic patients to help avoid amputation. MyBlueLabel (MBL) is a B2B software company specialized in compliance software. VulCur was developing a prototype in Skylab. The product was intended for use in clinics and hospitals and required FDA approval. It is therefore very important for VulCur to obtain the necessary approvals when they launch their product. FDA approval is mainly a question of documentation and ensuring compliance in relevant areas. MBL supplies VulCur with a software package that helps them document and track all the necessary elements of their work to obtain the FDA approval for their product. MBL had not provided their compliance software for a similar project before, where a startup needed FDA approval in a very short time. Therefore, they needed to adjust and modify the software platform based on VulCur's requirements. MBL and VulCur were already in dialogue when Skylab Pilots project team had the initial meeting with VulCur. There was a good mutual understanding of the project and what VulCur was trying to do, so it seemed like the match was relatively easy to make in this case.

In the Pilots project VulCur performed the development work in Skylab Developer Hall. The Skylab Pilot program manager assisted them with product development and the use of the metal workshop. The Pilot program also helped recruit students for VulCur's project. Since the collaboration between VulCur

and MyBlueLabel was focused on the compliance *software*, it was a bit difficult to be visible in the Development Hall.

Project progress

Before starting the Pilot project, **MBL** already had experience in collaborating with universities (e.g., Aarhus University) and other public organizations. MBL needed to offer software solution that makes the FDA approval process faster and cheaper for MedTech startups. The company recognized the value proposition in the Vulcur case, where a small MedTech startup company needed to get FDA approval in a short time span. Such customer needs can be validated and substantiated based on the learning through the Vulcur case.

Vulcur had 2 pending patent applications, which added credit in the eyes of investors. The younger founder identified the market needs (wound care clinics) and connected to a US partner when he was at UC Berkeley in the US. Thus, from the beginning, the Vulcur innovation and the business communication were designed for the US market, as similar markets in Europe will take much longer time and effort to get approval. The market-pull from the US also urged Vulcur to consider adding automated robotics into the product prototype. The CEO of the US partner also sits on Vulcur's board, allowing the startup us to use one of his clinics to use their equipment. The startup was extremely proud of its technological development**.** The cofounders were also high in confidence in their business success in the future, while fully aware of risks ahead of the journey (e.g., technology, funding, legal, and management of the growing startup). The startup also desperately needed a new CTO to take over the technology oversight from the younger co-founder.

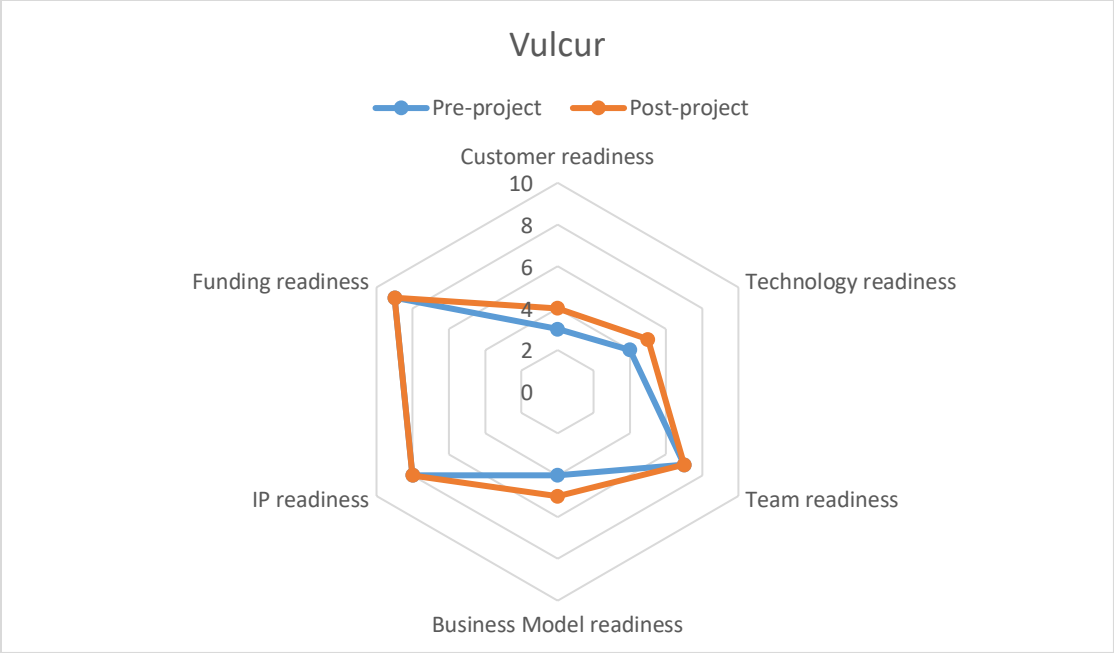
At the end of the Pilot project, the Pilot program manager reflected that the collaboration with SMEs was premature when Vulcur joined the Pilot program because the software was not immediately ready and needed time to define and develop. It wasn't a wrong match, but the timing of the collaboration was not the best. So, the collaboration was practically 6 months off, during which not much actual collaboration had taken place. **MBL** did not have much interaction with the students in the project either, because they mainly needed to focus on Vulcur's product development requirements. However, **Vulcur** made the best use of the Pilots program by using all facilities available: lab, metal workshop, and metal/robotics/computer. The founders also learned differences in the US market and the Danish market and realized the importance of adapting business models in different markets. Vulcur eventually relocated to Brazil to hire full-time employees at low cost.

A summary of key achievements or progress of the companies at the end of the Pilot project are:

Vulcur

- Learned how to work with students at DTU
- Students significantly contributed to the project progress
- Developed the startup by connecting to partners outside of DTU
- Receiving other startup grants
- Learned differences between foreign markets (e.g., the US) and Denmark
- Best use of DTU Skylab facilities

The startup's innovation was assessed before and after the Pilot project, using the KTH IRL framework, to display visible development progress. The result is shown in the figure below. The areas that the startup has progressed the most were technology readiness and customer readiness, but not significantly. In general, the startup venture has not progressed much in terms of the KTH IRL assessment, but we noticed their learning benefits listed above.



4.StaySeat and Meyers

	Startup	SME
Company	**StaySeat ApS** CVR-nr 41792620 Christianehøj 92, 1. th., 2860 Søborg	**Meyers A/S** CVR-nr 41810556 Dampfærgevej 10, 1., 2100 København Ø
Established	26-10-2020	01-11-20

Project background

The Pilots project consists of the StaySeat team and Meyers—a rather large SME—that was founded more than 30 years ago. The main activities of Meyers lie within restaurant and canteen management, catering, bakery, products for retail, team building, research, communication, education, and consultancy. Meyers has a strong vision about achieving the sustainable transformation of the food systems. StaySeat aims at developing heating cushions for the outdoor seats in restaurants and cafes, using an intelligent charging system and using IoT integration to track cushions and to extract data.

Project progress

Before starting the Pilot project, *Meyers* had a strong sustainability agenda, and had recently launched a sustainability strategy. To implement this strategy, they recognized the need to collaborate with different stakeholders. Meyers had established several collaborations in this regard, such as a partnership with Copenhagen municipality regarding the ecological transformation in all public institutions. Furthermore, Meyer restaurants established collaborations with an organization called 'Zero Footprint', as well as with various farmers. Meyers saw an opportunity in working with StaySeat for two key reasons. First, they always valued entrepreneurship and partnerships. Second, they viewed the heating cushions as a very

innovative solution and a concrete project to accelerate their sustainability strategy. From their side, they gave the possibility to StaySeat to have the product tested in the field. They also gave founders feedback on the design of the cushions, and input on the go-to-market strategy and PR.

The founders of *StaySeat* were about to finish their education (Diplom on Process and Innovation), with one of them specializing in hardware/software and the other one on business administration and finance. Despite their young age, the founders had considerable collaboration experience that gave them exposure to knowledge about different aspects of their business. Their motivation behind joining the Pilots was twofold: a) to advance their technology, as they were experiencing a challenge in enabling charging of multiple cushions, and b) to achieve their business goals. These goals could be better achieved, when having working space in Skylab (which is according to them "a magnet for talent"), as well as access to materials, machines, and tools. The timing to push their project forward was considered ideal by the founders, given the green agenda, the pricing of some of the needed materials (batteries) and the need for outdoor experience in restaurants and cafes due to COVID-19. Their confidence in the success of the business was thus high, as they were 90-95% confident that their startup would still be operating within 5 years from the time of the interview.

At the end of the Pilot project, both the startup and the SME were satisfied with the experience. *Meyers* were still very interested in StaySeat's product and still found it aligned with their sustainability strategy. Meyers not only were about to test it again in another location, but they were pitching the product to their collaborators (e.g., an outdoor cinema). They believed in the success of the product because they considered it a very novel product that was matching a real market need, and because of the high energy of the founding team. They considered their collaboration problem-free, however, they recognized that Meyer's input and their communication with the founders was primarily provided in the beginning of the project, rather than throughout—a reflection that was also made by the founders. The project left Meyers interested in a partnership around DTU in the future.

According to *Stayseat's* founders, they made good progress during the project, and they remained highly confident in the success potential of their startup. They built new components for the different parts of their product, and since starting the Pilot project, they increased the number of prototype seats from 100 to 450. They engaged with many customers, making good use of their connection to DTU—that increased the credibility of their entrepreneurial endeavor and opened the door for them several times. By the end of the project, they had references from 22 customer locations. They experienced various benefits by being part of the Pilot project. They saw great benefits in working in the Developer Hall and using the equipment, instead of working in a random "basement" garage, as they viewed the Developer Hall at DTU as a "pressure cooker, with crazy engineers to build their technology". They found the environment inspiring, and they learned a lot from the different Pilot teams that were working there. They also appreciated the good communication with the project managers, and they had the feeling that their standard answer is not a "no", but that they were trying to make things work. Finally, they applauded the decision of the project managers to move their office to the Developer Hall and be close to the Pilots startups.

The founders also identified two dimensions that somewhat lacked. First, while they really valued being part of the Developer Hall, the co-founder, who was working on the business/budgeting side of the startup, would appreciate the opportunity to have some quiet space in Skylab to concentrate. Second, they commented that they could have engaged more students in the project, as they engaged only two.

A summary of key features of the startup and the SME at the end of the Pilot project are:

StaySeat:

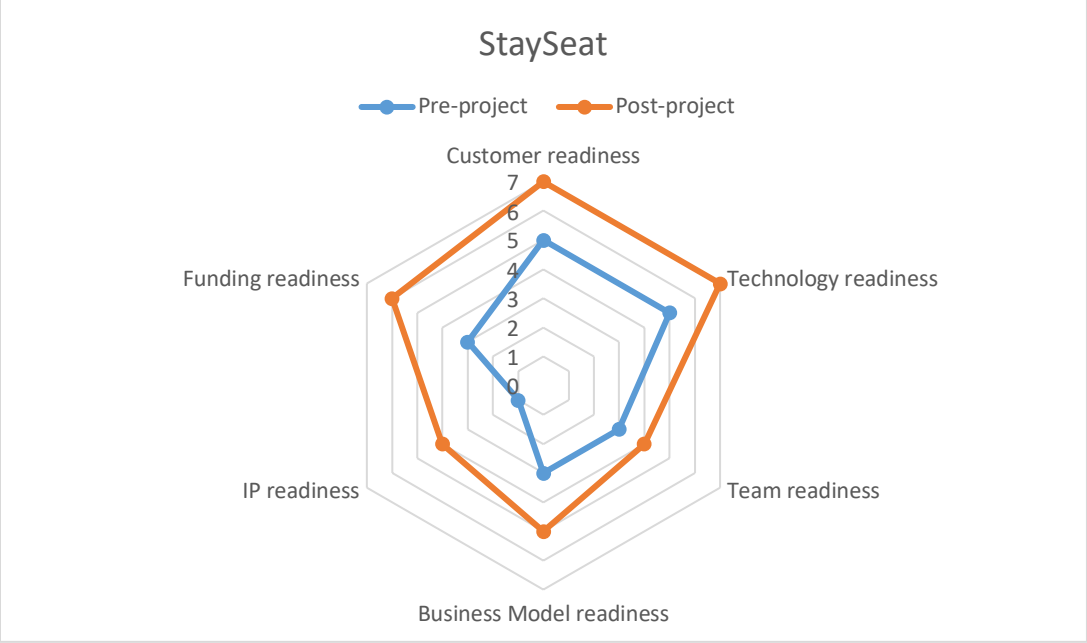
- Use of the DTU brand to approach customers

- Significant product development
- Increase in sales – references from 22 customer locations
- Value in working in the Developer Hall (albeit the lack of a quiet space to work on budgeting)
- Good atmosphere in the Pilots project – Knowledge exchange among the Pilots startups
- Good communication with project managers
- Small engagement of students

Meyers:

- Startup's product very innovative
- Alignment with their sustainability strategy
- Pitching the product to their partners
- Communication with the startup taking place primarily in the beginning of the project

The startup's innovation was assessed before and after the Pilot project, using the KTH IRL framework, to display visible development progress. The result is shown in the figure below. The areas that the startup has progressed the most were IP readiness, funding readiness, technology readiness, customer readiness. It seems that the startup has progressed a lot during the project period.



5.Airy Automotive and Kapacitet

	Startup	SME
Company	**Airy Automotive ApS** CVR-nr 44118246 Niels Bruunsvej 7 2670 Greve	**Kapacitet A/S** CVR-nr 26028825 Troljevej 2 2900 Hellerup

Established	14-06-2023	01-01-2001

Project background

Airy Automotive (hereafter, Airy) is a startup that specializes in carbon fiber mass-producible methods. It explores new technologies to implement FIBER DRIVE in large unibody castings. AIRY is designing and engineering a new family EV sedan that can be manufactured with an unprecedented less than 1000 unique components and claims to have a range of more than 1000 km. Yet, technologies and market remain to be developed for Airy. The founders are Gustau Lange and Rasmush Hauschild, both car enthusiasts. Gustau has had working experience at Koenigsegg in Sweden and gained extensive knowledge on car design and engineering. Kapacitet is Danish R&D Engineering consultancy, which combines engineering and craftsmanship to solve problems and design solutions for industry clients. They have product design, engineering and manufacturing expertise for healthcare, consumer goods, maritime products and other industrial sectors.

Airy Automotive was matched with Kapacitet by the Pilots program manager. Airy was aiming at developing multiple expertise in automotive design, including active aero dynamics, modular inertia, simplified casting of compound material and mechatronics. Airy also chose to be located at DTU to get access to talents among engineering students and professors. On the other hand, Kapacitet has strong expertise in product design, mechanical engineering and production. They found complementary resources and interests. The key person at Kapacitet, Anders Michelse, has a passion in manufacturing and engineering of automotive. So, he had a personal interest in collaborating with Airy.

Project progress

Before starting the Pilot project, Kapacitet was contacted by the Pilot manager and found the Airy startup interesting, as Anders Michelsen at Kapacitet is a car enthusiast and would love to join as a hobby project. Kapacitet also wanted to get closer collaboration with DTU through this project. Kapacitet envisioned to push the commercial progress of Airy, as Ander Michelsen has been a jury member for Danish Tech Challenge (DTC) and has much engineering and product design experience. Kapacitet as an SME partner has had experience in collaboration with universities, hospitals, and other public organizations. Roughly 50% of their turnover comes from startup clients. Airy's founder Gustau has also been a car enthusiast and always wanted to have his own company. One of Airy's primary goals was to build a connection with DTU. Airy intended to develop car technologies including active aerodynamics, modular inertia, simplified casting of compound material, mechatronics, and aftermarket, which can be licensed out. Airy wanted to engage with students, make good use of the Skylab facilities (workshops), networking and explore funding opportunities by being a part of DTU. However, Airy was inexperienced with hiring and working with university students, a skill learned over the project. As Airy has been building a car prototype in Skylab, it was visually very attractive to students and visitors, which has given *n*umerous leads of network resources. Airy was very confident about the success but also conscious about the risk ahead of them. Therefore, Airy was open *to* new partnerships and change in their business model. Airy was also open to establishing collaborations with DTU researchers.

At the end of the Pilot project, Airy developed its management team with full scale, technologies and network. However, Airy admitted that there is still a long way to go, as limited funding sources does not allow for further fast-pace development. Airy was one of the most successful startups in the Pilot program in terms of recruiting students. The fact that Gustau used to be a DTU student helped him a lot to navigate the DTU system. However, Airy has made a significant change of its business strategy, which

was not aligned with the suggestions ofKapacitet, so that Kapacitet was only able to offer technical and market advise to Airy at the early stages of the program, but not so much after the change in Airy's strategy. Even though the direct contribution has been limited in the later phase, Kapacitet found it valuable being part of the Pilots because it gave them access to a large network of startups, events, and students. In other words, the value of the Pilot is not limited to the 1:1 relationship between the startup and the SME. As Kapacitet is an engineering consultancy company, this type of spillover effect is important for them. Both Airy and Kapacitet found the Pilots program managers competent and helpful, and were of the opinion that DTU Skylab has offered a good platform to develop the startup.

A summary of key features of the startup and the SME are listed below:

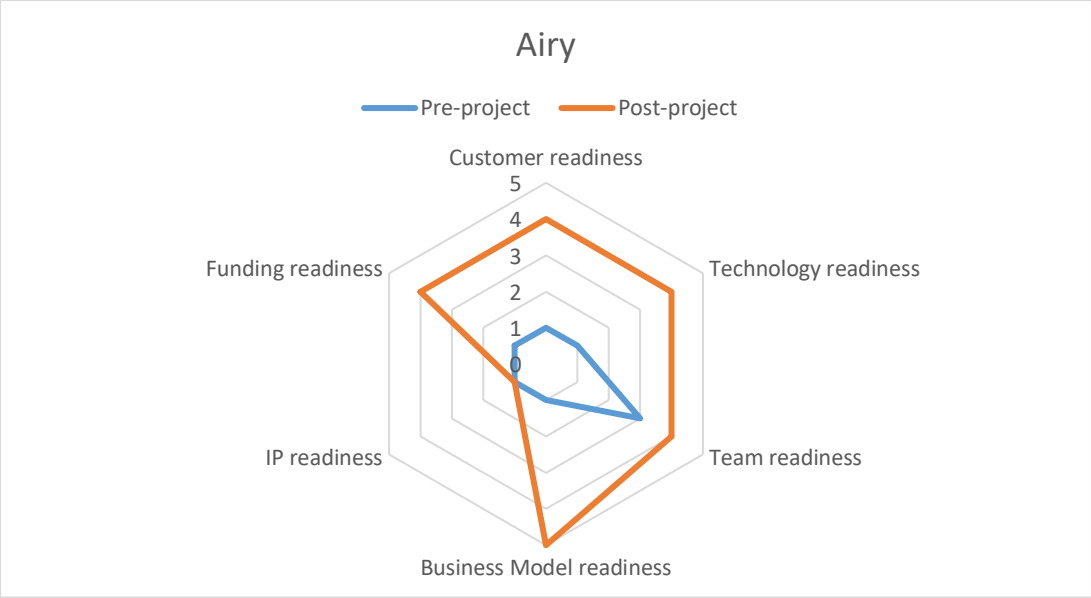
Airy Automotive:

- Use of the DTU brand to develop network
- Significant technology development and team development
- Refined business model
- Value in working in the Developer Hall – significant attraction by making a car prototype
- Good communication with project managers
- Extensive engagement of students

Kapacitet:

- Collaboration experience with various stakeholders
- Helped the startup with feedback to improve product design
- Seeing value beyond the single startup partner

The startup's innovation was assessed before and after the Pilot project, using the KTH IRL framework, to display visible development progress. The result is shown in the figure below. The areas that the startup has progressed the most were funding readiness, technology readiness, customer readiness, and business model readiness. It seems that the startup has progressed a lot during the project period, except for the IP readiness. This is because IP in this case has not been the main concern of the company at all at the moment, as little can be patented.



6.EXO360 and Damvig

	Startup	SME
Company	**EXO360 ApS** CVR-nr 40431721 Republikken Vesterbrogade 26, 1620, København V	**Damvig A/S** CVR-nr 30570766 Kuldyssen 6 2630 Taastrup
Established	01-04-2019	25-04-2007

Project background

EXO360 is a startup that offers revolutionary treatment for broken bones, using advanced elastomeric materials, 3D design tools, additive manufacturing and data science, to make it possible to redefine orthopaedical care. It creates a novel casting device that drastically improves the treatment options for broken bones and other orthopaedical conditions. The idea was invented about 3 years ago, inspired by one of the founders' PhD research. Damvig is an SME that is specialized in 3D printing technology, and has extensive experience in 3D printing and additive manufacturing so that it is able to advise and support industry clients on the choice of materials and prepping of files for printing.

Exo360 was matched with Damvig by the Pilot program manager, and they have found each other very relevant and useful. On the one hand, EXO360 was aiming at developing casting techniques with Damvig. On the other hand, Damvig has strong expertise in additive manufacturing and is open to collaborations with startups. They found complementary resources and interests. Damvig has had extensive experience in collaborating with startups without entering client relationships and also highly appreciated the opportunity to work with DTU.

Project progress

Before starting the Pilot project, EXO360 had already collaborated with a professor at SDU with regard to carbon technology for casting. Co-founders of EXO360 had experience with research at universities. So, it is not foreign to them to be hosted at a university and benefit from the resources and network embedded at such an environment. They had a plan to market the product next year as a Class 1 medical device (which eventually proved to be difficult to achieve). It envisioned to ask Damvig to make the cast work effectively and get soft funding during the project time. They also had the ambition to apply for Eurostar funding. The startup also anticipated to be acquired (e.g., by Johnson & Johnson) within 5 years as an exit strategy. Damvig, on the other hand, has had extensive experience collaborating with universities and startups. The CEO of the company has always been curious and willing to work with high potential startups, for which Damvig's 3D printing technologies can find applications. Both EXO360 and Damvig appreciate the facility at DTU Skylab and find it important to work with students.

At the end of the Pilot project, EXO360 found that it certainly speeded up the product development process by being a part of the Pilots program. EXO360 highly valued the Skylab facilities, workshops, talent pool of students, and especially the freedom that the Pilots program provided in working on what is key for the startup rather than putting pressure on reaching (unnecessary) mandatory milestones. EXO360 developed strong technical competencies through the Pilots program and successfully received a granted patent in mid-2023. The progress made in the Pilot program paved the way for EXO360 to successfully participate in other (national or international) incubation programs such as DTC, InnoFounder, and Euro Startups. EXO360 also made a collaboration project with a professor in product design at DTU. EXO360 and Damvig have been keeping close communication and interaction, which was one of the reasons that the startup could speed up the development process. Damvig has been very satisfied with the collaboration with EXO360 and found it a high potential customer in the near future.

A summary of key features of the startup and the SME are listed below:

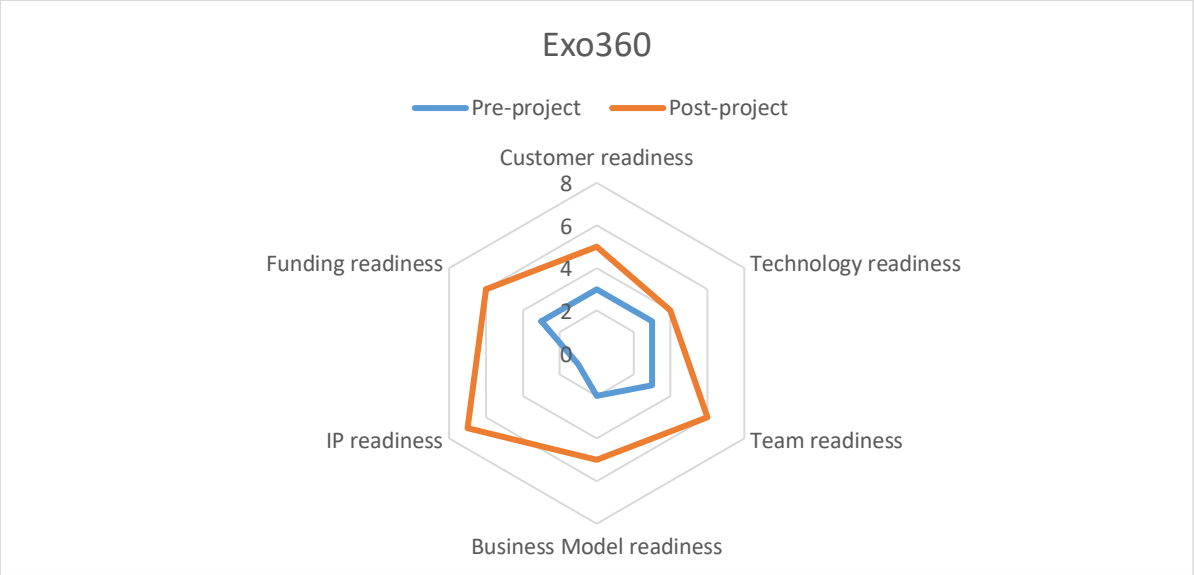
EXO360:

- Research-based idea and team
- Lack of technical competency initially, but fast learner and open-minded to take in external competencies
- Significant technology development and team development
- Value in working in the Developer Hall
- Good communication with project managers
- Extensive engagement of students through paid student jobs

Damvig:

- Collaboration experience with various stakeholders
- Helped the startup with feedback to speed up product development
- Seeing value beyond the single startup partner – long term oriented
- Value collaboration with DTU

The startup's innovation was assessed before and after the Pilot project, using the KTH IRL framework, to display visible development progress. The result is shown in the figure below. The areas that the startup has progressed the most were IP readiness, funding readiness, and team readiness. It seems that the startup has progressed substantially during the project period.



7.RoGlove and Copenhagen Flames

	Startup	SME
Company	**RoGlove**	**Copenhagen Flames** CVR-nr 37878235 Center Boulevard 5 International House, 2300 København
Established	Not registered at the time of the interview	15-07-2016 Ceased operation in April, 2023

Project background

The project consists of RoGlove startup initiative and the associated SME, Copenhagen Flames. The business idea for RoGlove was born in 2020 at a course at DTU, where the founders were students, and afterwards, went through the DTU Ignite program and Pilots. While at the Pilots program, the startup targeted the e-sports market, as gamers often face issues with hand functionality, and have often to quit gaming. Due to their focus on the gaming industry, they were matched with Copenhagen Flames, a Danish e-sports organization. Regrettably, Copenhagen Flames went bankrupt before the project ended (in April 2023), and an interview with them was not possible.

Project progress

Before starting the Pilots. Initially, the idea of RoGlove was to develop a glove with sensors that would be used as a rehabilitation device, by gamifying the process and reminding the users to do the rehabilitation. Along the way, they pivoted to the e-sports market, where the need for such a product was also high and without the difficulties associated with getting the device medically approved. The founders were students at DTU and had established some relevant contacts with DTU Professors with relevant expertise. During the project, one of these professors continued supporting them, in the form

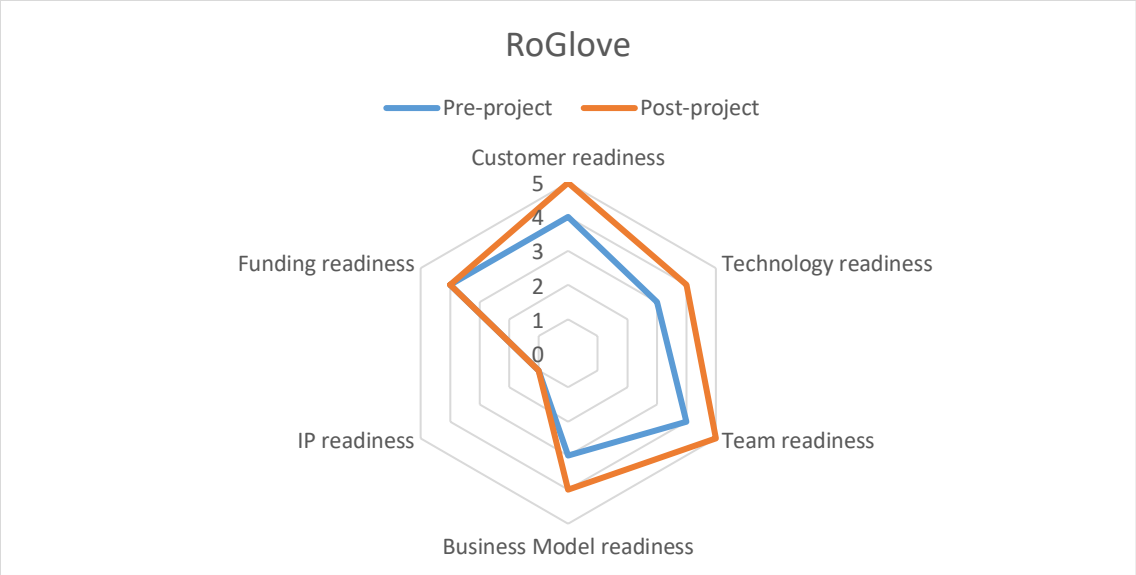
of supervision to special courses undertaken by students working with RoGlove. The progress of the startup was interrupted for several months, as one of the co-founders needed to work on her Master thesis. From their side, Copenhagen Flames had a strong interest working with RoGlove, as it is common that gamers lose hand functionality, and they are thus contractually obliged to take care of their physical health.

By the end of the Pilots, RoGlove had worked together with six students and appreciated the help, the time, and the depth in knowledge that the students offered to them. RoGlove believes that they benefited considerably from being part of Pilots and Skylab in general, as they were surrounded by innovation, in the form of other startups, founders, as well as immense networking possibilities. Furthermore, they appreciated their access to the Developer Hall, the exchange of information and learning with the founders of the other Pilot startups, and the help they received from the Pilots program managers. Despite these positive aspects, at the end of the project, RoGlove is less optimistic about the success of their startup, compared to when they started (at the beginning, they were 75% confident in the success of the startup, while they were only 50% confident at the time of the final interview with them), probably because of the break that they took in order to finish their education and because one of the co-founders had started a full-time job. They recognize, though, that this could reflect the startup roller coaster, and that their confidence levels may improve in the short run.

A summary of the key features of **RoGlove** at the end of the Pilot project are:

- Surrounded by innovation (startups and networking possibilities)
- Use of the Developer Hall
- Good communication with the program managers
- Immense learnings about having a startup (obstacles and ways to move forward)

The startup's innovation was assessed before and after the Pilot project, using the KTH IRL framework, to display visible development progress. The result is shown in the figure below. The areas that the startup has progressed in were customer readiness, technology readiness, team readiness and business model readiness.



8.Aerial Tools and SME

	Startup	SME
Company	**Aerial Tools ApS** CVR-nr 42764787 Diplomvej 381 2800 Kongens Lyngby	**Hans Følsgaard A/S** CVR-nr 55028818 Theilgaards Torv 1B 4600 Køge
Established	06.10.2021	16.01.1958

Project background

Aerial Tools was founded in 2021 to develop a heavy-duty VTOL (vertical take-off and landing) drone that can carry and control different types of sensors. They explored the possibility of partnering up with different types of SMEs, like hardware providers (e.g., providers of robots and electronics) and SMEs doing photogrammetry. They eventually partnered up with Hans Følsgaard, which would help them access the biggest solar park in Denmark. This partnership would help the SME show that they are innovative. Despite the initial in-person and online meetings the startup had initially with the SME, the collaboration did not move forward because their contact person from the SME went on paternity leave. The research team did not manage to talk with the SME, and thus the insights in this report come exclusively from the startup.

Project progress

Before starting the Pilots, Aerial Tools participated in several other programs, such as DTU Incubator, DTU Ignite, and the Danish Tech Challenge (DTC). They consider Pilots “unique”, in the sense that they “finally can develop the product”. Both co-founders have good knowledge of DTU. One of them did her PhD at DTU in a field relevant to the startup. They had significant collaboration and consultancy experience. They see the potential to target a variety ofmarkets, but they will *use* the solar parks market as their beachhead market, because it is a fast-growing market and in search of innovative solutions. In

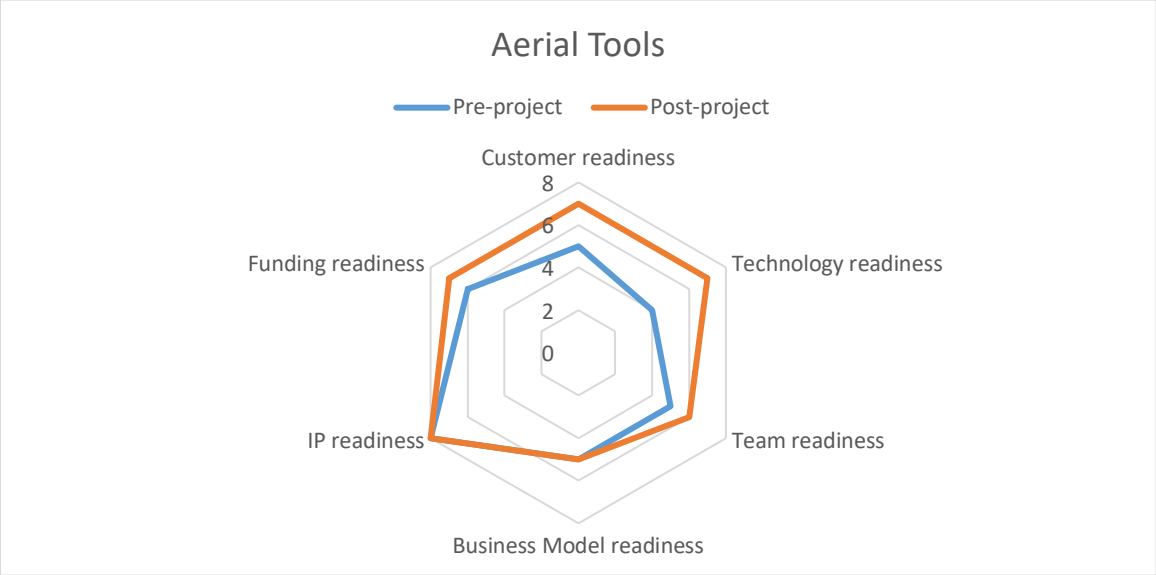
terms of geography, they target the Danish market, while they are also in talks with customers in Spain and Portugal.

By the end of the Pilot project, Aerial Tools had expanded their network considerably in Denmark and abroad. They engaged several students with different levels of success, and they build new relationships with professors at DTU, while they also capitalized on existing relationships with others (for example, professors from DTU Energy and DTU Space). They see value in engaging university professors in their project, because they can apply together to grant applications, they have a common interest in working with students, and they are interested in research and development. The founders' prior experience with tDTU helped them tremendously to navigate the ecosystem. They also received several grants (e.g., Innofounder, a European ESA grant, and European grant for women tech entrepreneurs). They received a patent on the pilots system and increased the technology readiness level of their solution considerably.

A summary of key features of **Aerial Tools** at the end of the Pilot project are:

- Significant product development
- Patent granted
- Collaborations with DTU professors
- Expansion of their network
- Significant learnings about fund raising
- Satisfaction with the space in the Developer Hall and the support provided by the project managers.

The startup's innovation was assessed before and after the Pilot project, using the KTH IRL framework, to display visible development progress. The result is shown in the figure below. The areas that the startup has progressed the most were customer readiness and technology readiness.



9.Yuman and Damviq

	Startup	SME
Company	**Yuman ApS** CVR-nr 43285866 Hans Bekkevolds Alle 2B, 2900 Hellerup	**Damvig A/S** CVR-nr 30570766 Kuldyssen 6 2630 Taastrup
Established	23-05-2022	25-04-2007

Project background

The project consists of the startup, Yuman, and the SME, Damviq. Yuman's mission is to provide healthcare-centered autonomous mobile robots to assist nurses with the transport of small equipment, while nurses care for their patients. Damviq specializes in 3D printing and additive manufacturing, advising and supporting industry clients on choosing materials and prepping files for printing. Yuman and Damviq were matched late in the project, as there were difficulties in finding an SME that would be a good fit with Yuman. The aim of the collaboration between the two companies was to explore the possibility of using the expertise of Damviq to produce the design for Yuman's robot. Damvig has had extensive experience in collaborating with startups without entering client relationships and welcomes the opportunity of working with DTU. As described earlier in the report, Damviq had a very fruitful collaboration with another Pilots startup, the EXO 360.

Project progress

Before starting the Pilot project. When the founders were about to start their Master's thesis, they saw the opportunity for an entrepreneurial thesis that would haveboth a technical and business aspect. That was the beginning of Yuman, immediately upon graduation from DTU. When they started the Pilot project, their goal was to target public hospitals, because nurses tend to burn out in these environments. Both founders were first-time entrepreneurs, with part-time work experience before starting their business, and no collaboration experience. When they got started, they did not have any substantial technology partners, but they had good relationships with professors from DTU Robotics. They decided to participate in the Skylab Pilots project, in order to have space to work, attract students to do their theses and special courses, be visible and in general to be part of the ecosystem. Furthermore, they received help from one of the project managers on the mechanics for their startup. While Yuman established collaborations with private and public hospitals to test their robots during the project, they were not matched with an SME in the strict sense of the Pilots program until later in the project. They were then matched with Damviq to see whether they could 3D print the robot, but after a few reviews, they decided not to do so, because it would be too expensive.

At the end of the Pilot project. While Yuman founders did not have very high expectations when they started Pilots, 10 months in the project, they were 100% confident about the success of their startup. Furthermore, while they initially targeted Denmark and Scandinavia only (and perhaps, Germany), they expanded their target market to the whole of Europe.

They appreciated several aspects of the program. First, the Pilots program was not very demanding, in terms of deliverables, like other programs supporting startups. As a result, they could focus on what was important to them, and to the needs of the startup at any given point in time. Second, they had space, access to Skylab's workshops, and tools to work with. Third, the climate in the

Developer Hall was good, transparent and helpful, and they enjoyed sharing experiences with the other Pilot startups. Finally, during the Pilots program, they worked with several students and they attracted the interest of many more; only in the Spring 2022, they had 20 students expressing interest working with them. Furthermore, thanks to the linkages they had to DTU, as DTU graduates, in several occasions they led the process of looking for supervisors for the students' projects with them, and they had kick-off meetings with the supervisors, sparring about what would be possible. A big downside they experienced was the fact that they were matched with Damviq late in the process. Getting earlier feedback from the SME that 3D printing their robot was not a good option would have given them more time to adjust the design for their robot and work on a design based on a different material (aluminum).

From their side, Damviq sees several benefits from working with startups, even though they concluded that 3D printing would not be a way to go for Yuman. They have the belief that in their type of business, "if you don't help the startups, you don't have any business in five years". They are of their opinion that they can learn from the challengesthat startups experience, and pass this knowledge to other startups they will advising. They, thus, see it as an investment, in order to have (new) customers in the future, and as marketing and branding for their company.

A summary of key features of the startup and the SME at the end of the Pilot project are:

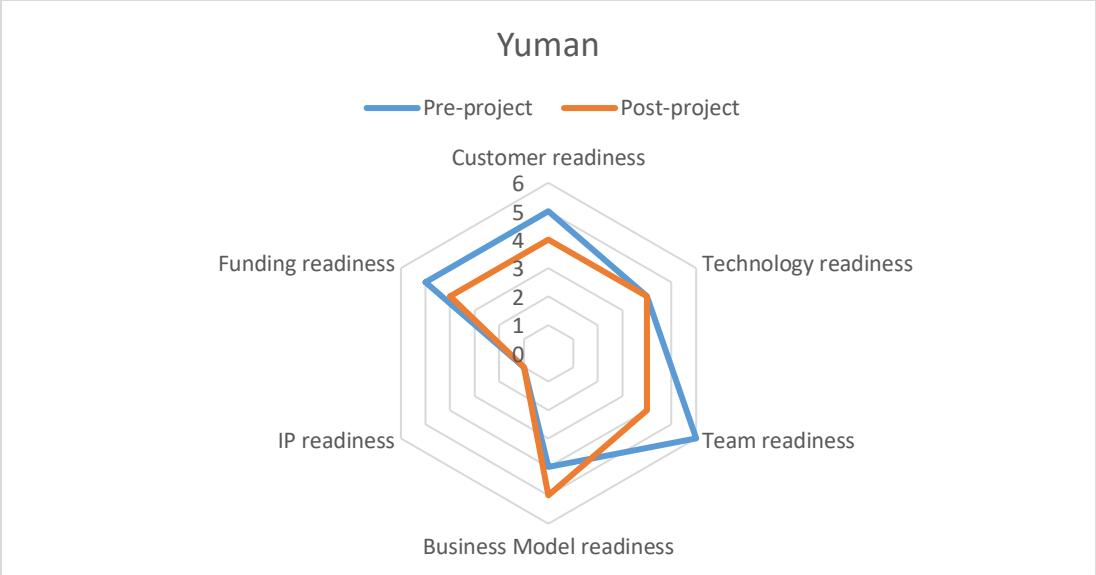
Yuman:

- Major developments and increased confidence in the success of the startup
- Good use of space and facilities
- Nice climate in the Pilot project
- Engagement of many students and sparring with supervisors
- Late matching with the SME, and realization that 3D printing would not be a good option (too expensive)

Damviq:

- Feedback to the startup that 3D printing would not be a good option
- Good learnings: they can provide the knowledge to the next startup

The startup's innovation was assessed before and after the Pilot project, using the KTH IRL framework, to display visible development progress. The result is shown in the figure below. The areas that the startup has progressed in were funding readiness, customer readiness, and team readiness. It seems that the startup has progressed a lot during the project period.



10.YakRescue

	Startup	SME
Company	**YakRescue**	YakRescue was not matched with a Danish SME Collaborations with SMEs outside Denmark (one from Austria and one from France)
Established	01-08-2022	

Project background

YakRescue is a startup that develops lightweight assistive robots (modular wheels) that can be placed under existing stretchers, allowing rescue agencies to conduct fast, safe, and co-efficient rescues. Since the beginning of the project, the startup has been in touch with stretcher manufacturers in Europe. Despite their effort to find similar SMEs in Denmark, it was not possible to find such manufacturers, perhaps because of the natural (mainly flat) landscape of Denmark and the lack of need of such products in the local market. They also explored the possibility to partner up with a Danish SME that would help them produce parts of their product, but they decided against this, because of the very high prices of the said SME, especially compared to the prices of international companies.

Project progress

Before starting the Pilots. The idea for YakRescue was born when the founder "connected the dots" between his interest in Robotics with the (random) information he received from a family friend that it is difficult to bring injured people down for rescue. The idea was to create a B2B company selling to the re-sellers who sell the stretchers, as this would be an easier approach to reach the customers. In particular, the companytargets Europe, especially the countries with tall mountains (e.g., Austria, France, Italy, and Switzerland). At a later stage, the company envisions also offering B2C solutions, for instance, for a solution that will help individuals move goods through tough terrains. Initially, the founder was working

with two interns. For a 6-month period, the startup relied on the personal savings of the founder, while he later received support from Innofounder. Given that the customers were already interested in the solution, the startup were 90% confident that they would succeed—confidence that remained high also at the end of the project. Their motivation to enter the Pilot project was multifaceted: to have access to the facilities, including the workshops; to get students on board; to establish contact with an SME, and to develop the product faster and better.

At the end of the Pilot project, YakRescue had developed the final product and were ready to sell, as soon as they were accredited the CE certification. They are working with two companies that make stretchers, one in Austria and one in France, who will sell to their customers YakRescue's product as an extra attachment to their own product. According to the founder, these two companies would be excellent official SME partners for the Pilots project, had they been located in Denmark. YakRescue appreciated many things with regard to their participation in the Pilots project: a) the physical scape and the use of all the facilities (such as 3D printers, metal workshop, the electronics workshop etc.), b) the support provided by the project managers, and their help in guiding them in how things are done in Denmark, c) the nice community of many Pilot startups, as they were sharing with each other their experiences, mistakes and progress, and d) the support they received from the R&D engineering consultancy company that was hired by the Pilots project managers to help the startups. They were also very satisfied with the work of four interns from abroad that were working full time on the startup. However, they were less happy with the help that they received from students, who would work only a few hours per week, as the startup felt that it was not possible to move forward with the tasks. Furthermore, they did not contact researchers from DTU, because to their knowledge, there were not professors working in topics related to rescues, aside from sea rescues—that were not relevant to the startup. YakRescue has not done the post-project IRL test, and this is why it is not reported in the current document.

A summary of key features of **YakRescue** at the end of the Pilot project are:

- Final product developed and ready to sell
- In the process of getting CE accreditation
- They were not matched with a Danish SME, but worked closely with an Austrian SME and a French SME
- Student internships worked well, but other student projects less so
- High satisfaction with the Pilots program and its offerings

Overall Assessment of the Pilots Cases

By reviewing all the completed cases, we found that SMEs made different contributions to helping the startups. A summary of SMEs' contribution to startup is listed in table 2 below.

Table 2 Types of SME's contribution to the startup

	Market	Technology development	Product development	Complementary knowledge	Operations	Network
Thorsen-Teknik (for AgriRobot)		X	X		X	

SPT (for CoastGrass)				X		
MBL (for Vulcur)	X			X		X
Meyers (for StaySeat)	X			X		
Kapacitet (for Airy)	X	X	X			
Damvig (for EXO360 and Yuman)		X	X	X		X
Copenhagen Flames (for RoGlove)	X					
Hans Følsgaard (for Aerial Tools)	X					X

Overall, the startups and SMEs in the Pilots program shared some common features prior to the program and some common progress/achievements after the program. Table 3 and Table 4 below summarize these common factors in a nutshell.

Table 3 Common features of startups and SMEs before the Pilots program

Key common features of startups (beginning of Pilots)	**Evidence found in cases**
Seek being close to DTU (to access people, network, technologies)	AgriRobot, Vulcur, StaySeat, Airy, Yuman, RoGlove, YakRescue
Global market, local development	AgriRobot, CoastGrass, Vulcur, EXO360
High confidence of success	AgriRobot, CoastGrass, Airy, EXO360, YakRescue
Lack of a clear competitive analysis (rather relying on a vague gut feeling)	AgriRobot, Airy
Agility to disrupt incumbents	AgriRobot, EXO360
Clear understanding of entry barrier	AgriRobot
Effectuation – lack of a clear plan of future direction	AgriRobot
Seeking knowledge about production	CoastGrass
A fair level of awareness of risks	Vulcur
Inexperienced founders, but strong collaboration experience	StaySeat, EXO360
Strong market need – Startup already has sales or is close to sell	StaySeat, YakRescue
Key common features of SMEs (beginning of Pilots)	
Importance of building trust with the startup	Thorsen-Teknik
Experience of collaborating with universities	Thorsen-Teknik (-), SPT (+), MBL (+), Kapacitet, Damvig

Collaboration experience with several stakeholders	Meyers, Kapacitet, Damvig
Collaboration with DTU is a crucial attraction	Thorsen-Teknik, Kapacitet, Damvig
Market-driven R&D	Thorsen-Teknik
Reduce R&D expenses through external collaboration with DTU and startup	Thorsen-Teknik
Aware of alternative technologies and advice to startup	Thorsen-Teknik, Kapacitet, Damvig
Seeking access to young talents from DTU	SPT, Airy, EXO360, Damvig
Seeking new knowledge instead of monetary return	SPT, Kapacitet, Damvig
Open-minded and passionate CEO for collaboration	SPT, EXO360
Seeing value proposition beyond the single startup partner	MBL, Kapacitet, Damvig
Strong sustainability agenda	Meyers
Value entrepreneurship	Meyers
Help the startup to test their product and enter the market	Meyers, Kapacitet, Damvig

Table 4 Common achievements of startups and SMEs after the Pilots program

Key common achievements of startups (end of Pilots)	**Evidence found in cases**
Draw upon DTU's brand name to attract attention from investors and market	AgriRobot, StaySeat
Learned how to (further) collaborate with DTU departments and researchers	Coastgrass, EXO360, Yuman
Learned how to work with students at DTU	AgriRobot, Coastgrass, EXO360, Airy, Yuman
Students significantly contributed to the project progress	AgriRobot, Vulcur, Airy, EXO360, Yuman, RoGlove
Knowledge spillover through informal communication with other Pilot companies	AgriRobot, StaySeat, Airy, EXO360, Yuman, RoGlove
Develop the startup to a next phase, connected to another DTU project (e.g., FutureBox or external program)	AgriRobot, Coastgrass, Airy, EXO360
Significant product development	StaySeat, EXO360, Yuman, YakRescue, Aerial Tools
Increase in product sales	StaySeat
Develop the startup by connecting to partners outside of DTU	Coastgrass, Vulcur, EXO360
Receiving other startup grants	Coastgrass, Vulcur, EXO360, Yuman, Aerial Tools
Learned differences between foreign markets (e.g., the US) and Denmark	Vulcur
Best use of DTU Skylab facilities	Vulcur, Bilen, Airy, EXO360, Yuman, YakRescue
Patent granted	Aerial Tools, EXO360
Key common achievements of SMEs (end of Pilots)	
Learned how to work with Skylab and look for new project opportunities	Thorsen-Teknik, Kapacitet, Damvig

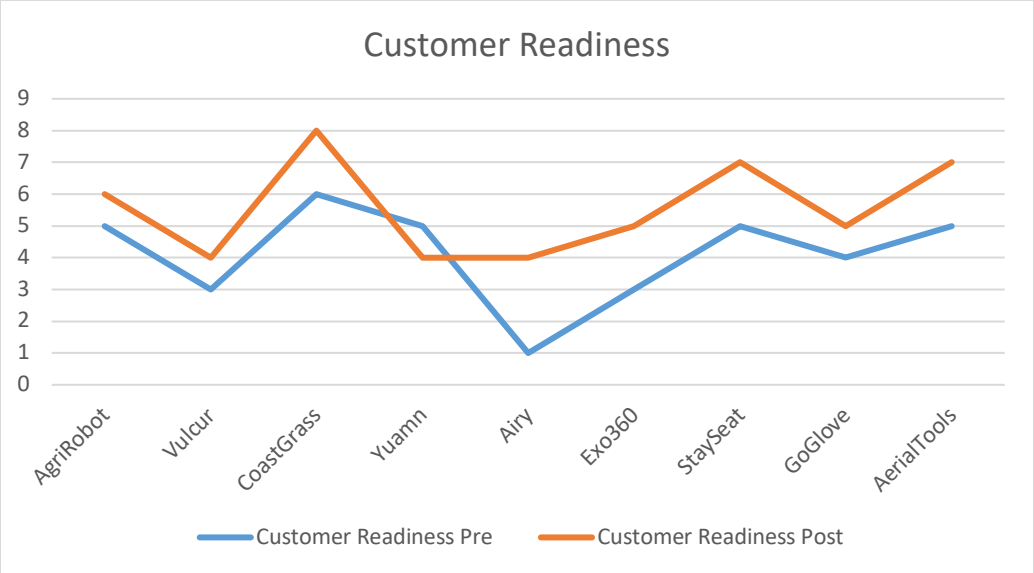
Enhanced confidence of business success	Thorsen-Teknik, Meyers, EXO360
Relocation of product development into a foreign country	Vulcur
Belief in the product's potential (innovative product)	Meyers
Continuation of support to the startup	Meyers, Damviq (EXO 360)

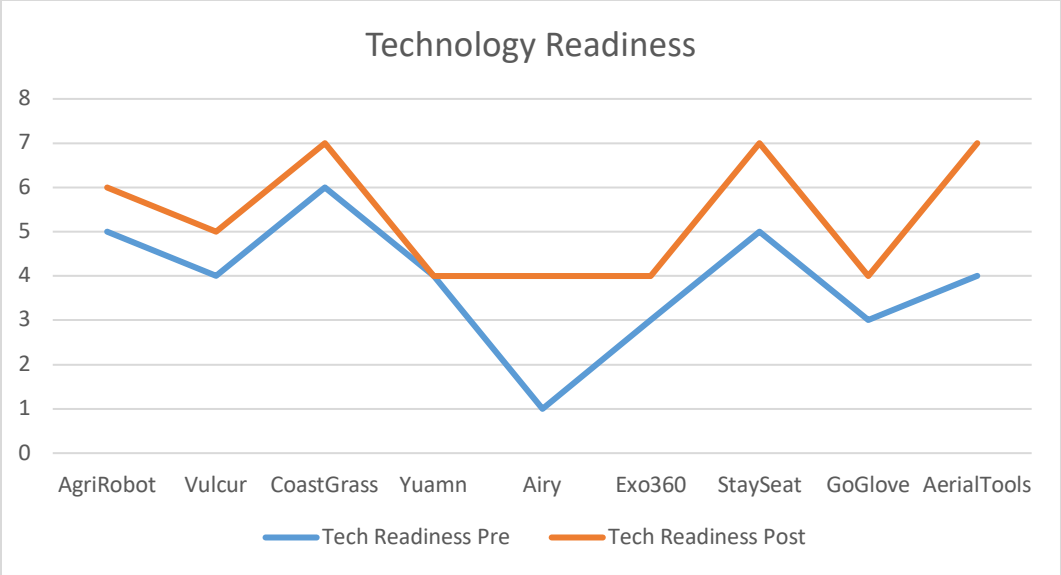
Regarding the impact on the startups' innovation readiness, an overview of the KTH Innovation Readiness Level assessment before and after the Pilot program is provided in table 5 below. Among all five dimensions of innovation readiness, IP readiness, Business readiness, and Technology readiness topped the most improved ones for the participating startups on average.

Table 5 KTH Innovation Readiness overview for startups before and after the Pilots program

	Pre-Pilot (Average)	Post Pilot (Average)	Increase
Customer Readiness	4,11	5,55	35,14%
Tech Readiness	3,89	5,33	37,14%
Team Readiness	4,55	5,33	17,07%
Business Readiness	3,67	5,11	39,39%
IP Readiness	3,00	4,44	48,15%
Funding Readiness	4,89	6,33	29,54%

To further illustrate in detail, the figures below show the detailed scores of KTH Innovation Readiness Level across the nine startups, for whom we had assessment before and after the Pilot program.




Technology Readiness
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AgriRobot
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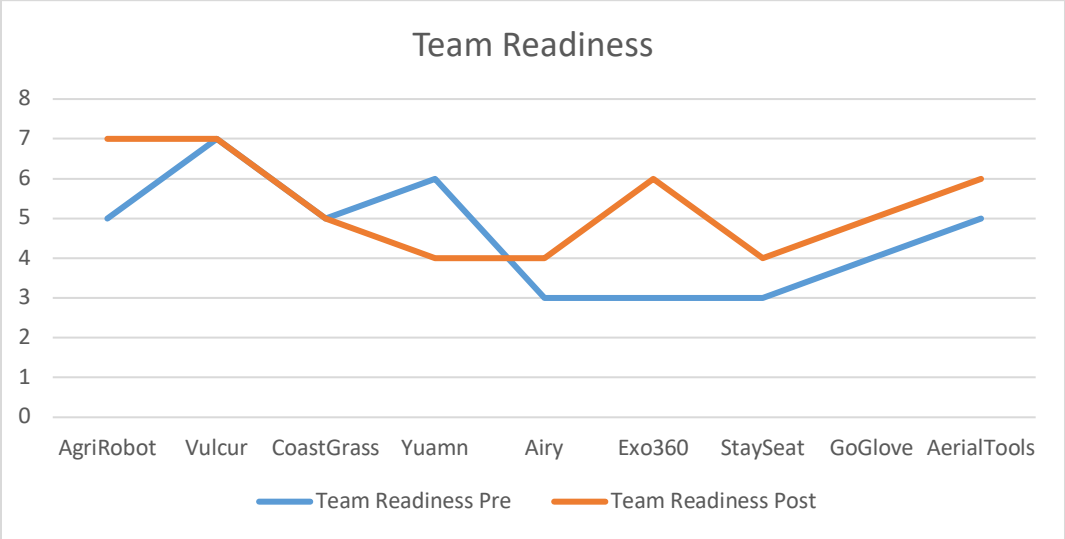
Exo360
StaySeat
GoGlove
AerialTools
Tech Readiness Pre
Tech Readiness Post


Team Readiness
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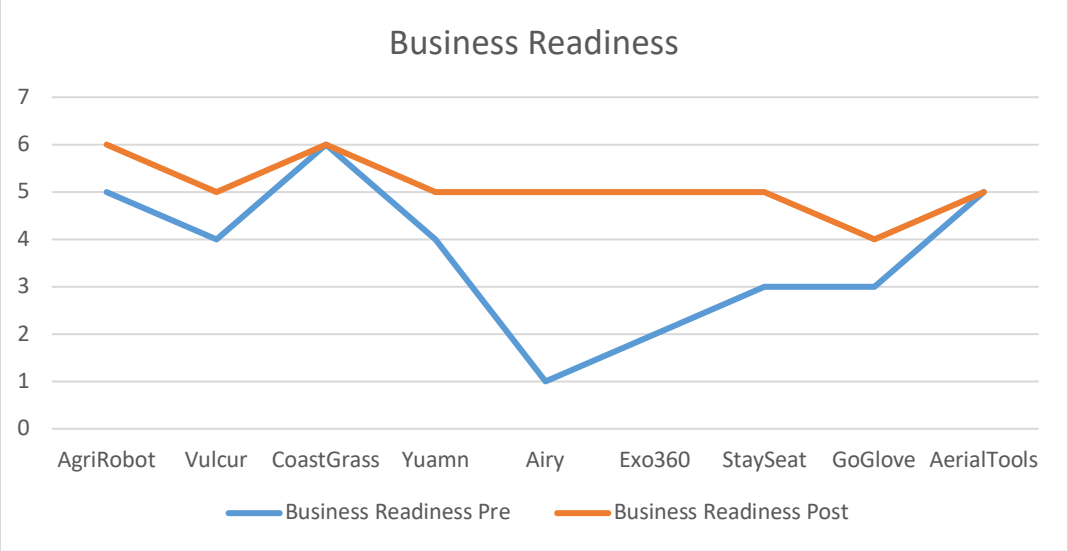
Vulcur
CoastGrass
Yuamn
Airy
Exo360
StaySeat
GoGlove
AerialTools
Team Readiness Pre
Team Readiness Post


Business Readiness
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AerialTools
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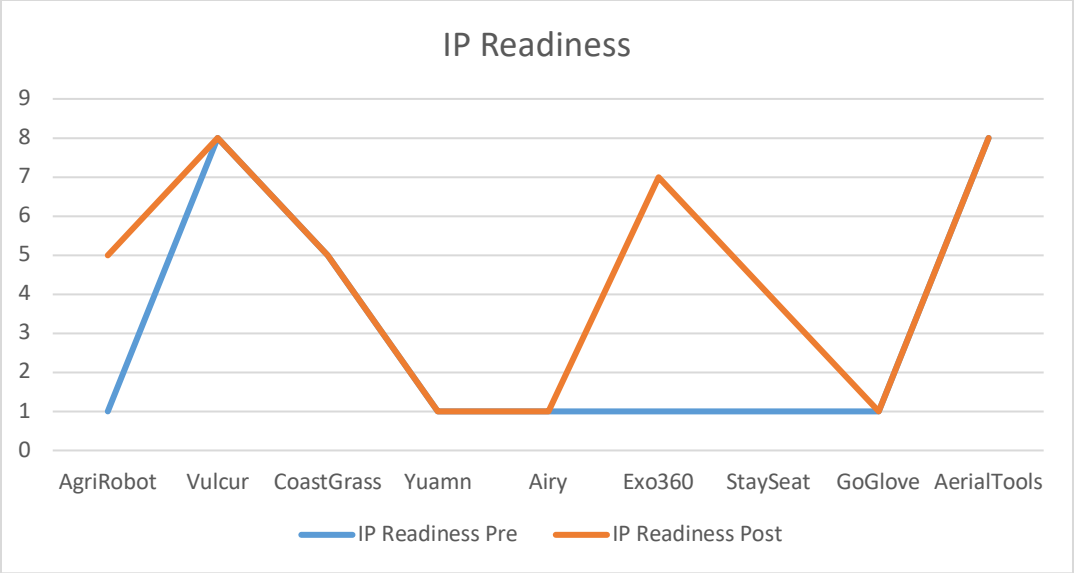

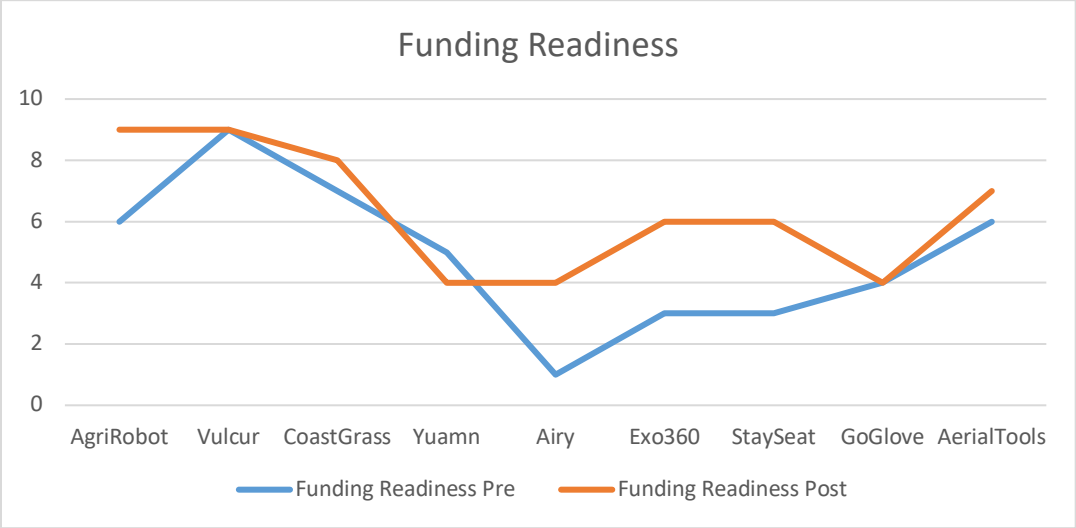

Note: At the moment of making this final report, the Pilot program has 2 ongoing projects, which have not been completed. The two startups are listed below. Since these projects are at early stages of development, we are not able to make a complete assessment of their progress and benefits from the Piloty project.

- TinyFarms
- UVISA

Impact on students

DTU students have played an important role and made significant contributions to the Pilots program. Up to the mid-2023, there have been more than 40 DTU students involved in the Pilots program by joining the startups, based on various formats, including thesis project, internship, special course, paid student

job, or simple unpaid project purely based on passion. We designed and distributed an online questionnaire to these students after they finished their projects. Nine completed responses were collected in the mid of February 2023. Even though the response rate was only about 25%, the insights derived from the answers were adequate to reveal the impact of the Pilots program on DTU students.

The students found the opportunities to work with startups in the Pilots program via various means, including LinkedIn, walk-in and talk at Skylab, and friends' recommendation. These students contributed knowledge through practices in terms of product development, user analysis, problem definition, prototyping, fund raising and project management.

A large proportion of the students who worked in the Pilots program have had work experience before joining the program – 44% had work experience at established companies, 33% at other startups, and 22% at public organizations. Among these students, many found that they enhanced their competencies through the Pilots program; according to their self-reports, 66% enhanced engineering competencies, 44% enhanced their entrepreneurial or business competencies, 55% developed professional network, 33% found new jobs afterwards, 44% found topics for their thesis projects, and 11% even identified a new business opportunity for him/herself after the Pilot program.

When being asked about why they joined program, the students responded that they found the tasks given by the startups "cool", interesting, and fitting with their studies. The students liked the Pilot program because they enjoyed an open working environment, where they could apply their knowledge to an actual project, while often working on something with a good purpose. They also appreciated the fact that through the Skylab Pilots project, they made new friends and got to know new people.

Key lessons for Pilots Project Management

Besides the impact on the startups, SMEs, and the students at DTU, other key lessons have been learned with regard to the project management of the Pilot program, the use of the Skylab facilities, and the relationship between companies and DTU. These key lessons are not only relevant and useful for the Pilots program to improve in its second phase, but also valuable for disseminate and replicate the Pilot model to other parts of Denmark among knowledge institutions, industry firms and startups. We summarize these key lessons, some of which are integrated into the new Pilots program model suggested in the next section.

1. The role **of program managers** was crucial for the progress of the Pilot program and the benefits that startups and SMEs may obtain. The project managers performed not only administrative tasks, but several crucial tasks to facilitate the companies through matchmaking, sense making, communication, engineering screening, market scouting, navigating within and outside of DTU, etc., among others. Therefore, it is extremely important to have competent project managers who have the know-what, know-how, and know-whom within the relevant ecosystem and play active role of intermediation is a crucial success factor for the Pilot program and future similar programs elsewhere in Denmark. The presence of the project managers in Skylab's Developer Hall (and not separately in an office), where the startups participating in the program were located, also played a crucial role. The proximity of the project managers with the startups facilitated the exchange of ideas and knowledge, as well as the development of a nice culture and atmosphere in the program.

Recommendation: We recommend having at least 2-3 full-time project managers in Pilots 2.0, closely located to the startups. Among the project managers, at least one should have a sound level of general technical competencies.

2. Like many other large universities, **DTU is a complex organization** of many departments, education programs, study lines, academics, as well as different incentive mechanisms that motivate students' and professors' performance. These are usually unknown areas for startups and SMEs outside of DTU to understand. Some startups found it quite complicated to know how to collaborate with DTU departments and scholars. In this regard, the role of Pilot program managers became crucial to help the startups to navigate the complex institutions within the university.

Recommendation: In Pilots 2.0, when recruiting the program managers, it is important to ensure at least one of the program managers is knowledgeable about the university partner and experienced in navigating the complex institution. In addition, effective training regarding how the university functions as a collaboration partner must be provided to the newly hired program managers who are from outside of DTU.

3. From the student survey and the interviews with the startups and Pilot program managers, we assessed the contribution of two key players of the university ecosystem: **students** and **DTU professors (academic staff)**. Students in Pilots 1.0 are typically recruited directly from a startup, in various formats (such as thesis project, internship, special course, and student job) and have reported that through their participation in Pilots 1.0, they enhanced both their engineering and their entrepreneurial/business competences. From their side, the contribution of DTU professors has not been fully utilized. Their role was limited to supervising student projects that were attached to the startups' work, as professors have professional responsibility to supervise the student's courses and student projects. However, with few exceptions, professors would not be actively in touch with the entrepreneurs or the associated SME, sometimes causing misalignment between the professors and the startups with regard to the expectations and the tasks required to be done by the students. The root cause could be that, at DTU, professors are not incentivized to participate in small projects with limited funding. Therefore, it has been difficult to invite relevant professors to directly join the Pilots projects because they could not see clear benefits in doing so. To make this linkage stronger and leverage work effectively, it requires Pilots program managers' knowledge about how academic staff work and get evaluated, and what the formats of student projects are within the university.

Recommendation: Through on-job training offered to the Program managers and extensive networking efforts, Pilota 2.0 should raise awareness among DTU departments and connect to curriculum activities of DTU students so that DTU professors are motivated to participate. Furthermore, Pilota 2.0 could explore the possibility of having a pool of students who can offer ad-hoc support to several startups/SMEs, when a need arises and within their area of expertise (e.g., software, mechanics). This would help to avoid delays in performing some tasks and would speed up the process of the startup and product development.

4. The **physical space** (i.e., the Developer Hall at Skylab) and **other facilities at DTU** have been a key factor that helped the participating startups and students. The physical space not only has offered access to tools, workshops, information and knowledge, but it also served as a platform for knowledge sharing, networking, trust building based on day-to-day communication--- creating a

sense of belonging to the participating firms. However, the use of the physical space has not been problem-free. Several startups pointed out that although they really appreciate the fact that they have such a nice place to work at the Developer Hall, sometimes they could not get the right tools, or were not allowed to use some tools due to the way the tools are managed at Skylab. Furthermore, the Developer Hall has always been a "showroom" for Skylab and DTU and is a very popular place for students, visitors, and all kinds of DTU guests. This can sometimes be disturbing because the startups must talk to the visitors (often high-level people), disrupting their work. Some startups took a while to adapt to the physical working space and would appreciate it if the Developer Hall were less busy with visitors. This is an area where ideas for improvement can be explored within the Pilot program and improvements in the physical setup of the program can be considered for future Pilot programs at DTU and elsewhere in Denmark.

Recommendation: We recommend including budget items in Pilots 2.0 to redesign or improve the Developer Hall at Skylab. In addition, it is recommended for DTU and other hosting universities to provide the founders and employees of the startups with the university IT credentials to make it easy for them to get access to internet, university's online resources and other administrative information (such as meeting rooms booking).

5. Pilot 2.0 should consider a complementary approach to match startups and SMEs by **considering SMEs' needs first**. In its current setting, the Pilot program first recruited startups and then searched for SMEs to match with the startup's needs. This approach has worked very well for some pairs of SMEs-startups, with SMEs seeing benefits from this collaboration, in the form of innovation, working toward sustainability goals, and creating the foundation for potential supplier-customer relationships in the long run. However, this approach has sometimes met difficulties. For example, Danish SMEs can be too expensive to consider for a specific startup, or the specific resources/skills that a startup needs are not in Denmark, but in companies in other countries. An opinion we heard from interviews is that Pilots 2.0 may consider reaching out to a large network of SMEs in Denmark and listen to their needs and then look for suitable startups to match.

Recommendation: Pilots 2.0 may consider dual paths of recruiting companies – one is to reach out to startups first, and the other is to reach out to SMEs first. It is also recommended that the matchmaking should not always be gate-kept by program managers or administered on a one-to-one basis. Instead, the Pilots 2.0 program could search for a pool of SMEs and startups that would be interested in participating in Pilots and provide a platform for them to interact with as early as possible and explore mutual needs and the possibility of collaborating in a "speed dating" format before formalizing the fixed partnership.

6. Pilots 2.0 will benefit from **having professional engineering advisors** throughout the program period. We found that startups largely appreciated the professional advice in product engineering from a professional R&D engineering consultancy. Professional product engineering competencies complement the knowledge base of the program managers and the university. The startups will be able to get hands-on advice on product development.

Recommendation: Pilot 2.0 could include budget items for professional engineering advising and hire competent consultants to offer regular advising meetings to the startups.

7. Many startups in the Pilots program appreciate the program because it is "**not so demanding**" as other innovation/startup incubation programs, so that the startups can define their own development pace based on their unique needs, without having a set of pre-determined set of milestones and deliverables that would not be right for them. Several startups in the program managed to participate in other incubation and acceleration programs, such as DTC, Euro Startup, Inno Explorer, etc., which created assets and experience complementary to the Pilots program. As mentioned earlier, the uniqueness of the Pilots program lies in the fact that it creates the space (and provides relevant support) for startups to work on the technical side of their business and develop their product.

Recommendations: The fuzzy front end of product innovation needs support, but also freedom and space to navigate uncertainty. Providing supporting frameworks and resources without imposing much administrative paperwork to simply fulfill often irrelevant to a specific startup milestone, should be a crucial design feature for the future versions of the Pilots program. Less milestones predetermined for all the companies and more space for them to explore, combined with access to the necessary facilities and close support from the program managers, is the key formula in the Pilots program.

Refining the Pilots Model – towards a replicable Pilots Model 2.0

Skylab Pilots has been running for around two years at DTU Skylab in the Developer Hall. The program was based on an exploratory Pilot model that aims at establishing a triangle partnership, connecting startups, SMEs, and university. With the experience of running the program, DTU Skylab has developed new knowledge about the strengths and weaknesses of the initial Pilot model and reflected on the key lessons learned from the actual practices of the stakeholders. It is our intention to advance the Pilot Model into a refined and enriched version, **Pilots Model 2.0**, which can be applied to the future versions of the Pilots program, as well as replicated in other contexts where the triangle partnership can be established in Denmark. In this section, we present the Pilot Model 2.0 in detail and explain its nuanced network structure, process, objectives, governance, actions, and resources. In this way, DTU Skylab following the Pilots Model 2.0 can continue with a new round of the Pilots program and hopefully other universities or relevant organizations can replicate the model in their own local context.

Network structure

Figure 1 below shows the Pilots 2.0 model's network structure with key partnership, key functions of program managers, the university internal landscape, and external landscape.

Key partnership: In the Pilot Model the key partnership is between an SME and a startup, who find complementary interests and appreciate the access to university's resources, such as state-of-the-art research and talented young students. The startups are in need of developing the focal technology, product or market and will be directly hosted at the university, while the SMEs, for example, are looking for creating a long-term client, being innovative applying the SME's specialized technologies into new markets, or tapping into university's research project with a business case, etc. The SMEs do not necessarily need to have personnel present in the Pilots project's space on an ongoing basis, creating thus the potential of collaborations with startups that are located in other parts of Denmark. Communication between the SME and startup can be frequent and facilitated by the program manager at the early phase of the partnership, but as the collaboration progresses and mutual needs and interests are calibrated, the communication can become more ad hoc and on demand during the project. The Pilots program managers

are recommended to help establish trust and monitor the communication between pairs of SME and startups throughout the project.

Key functions and competencies of the program managers: Pilots project managers need to focus considerably on **dedicated match making management**s. They must reserve a pre-program phase to collect information about relevant SMEs and startups in the region (and beyond) across industries as potential candidates to be recruited in the program. It is a specialized competency of the program manager to know how to **incentivize the SMEs and startups**. On the one hand, the program managers contact the startups and help them to articulate their needs related to the product development in the near future; on the other hand, the program managers should also "translate" the startups' needs into value proposition for SMEs so that the SME can see a potential value in the partnership beyond direct monetary return. It is equally important to listen to and understand the needs of SMEs and match them with the startups. This is not to say that the matchmaking needs to be always closely administered by the project managers on an one-to-one basis (for instance, as mentioned earlier, the Pilots managers can bring together a pool of startups with a pool of SMEs for speed-dating), but rather that the project managers need to invest in developing this matchmaking management skill, and employ it in a way that would serve the best each project. Once an SME and a startup are matched, t**he partnership needs to be monitored with good communication**, facilitated by the program managers when necessary. Different opinions or conflicts might emerge, so the **program managers also play a role of mitigating**. Knowledge sharing and spillover can be fostered by offering **a common workspace** for all the startups and organizing regular workshops and information meetings among the companies.

The program managers function as a team, which should collectively possess a set of different competencies. It is crucial for the success of the program to have at least three competencies:

1. **General technical competencies**: At least one program manager should possess a sound level of general technical competency in terms of product design, production, materials, use of mechanical workshops, and knowledge about relevant industrial firms in Denmark.

2. **University internal knowledge**: At least one program manager should have extensive experience in how the university works in relation to research, education, HR, and cross-departmental collaborations. Such knowledge is crucial to help startups to navigate the complex system within the university.

3. **Project management dedication**: At least one program manager should have strong experience in project management and a dedicated effort to follow up with all projects within the program. This needs careful follow-up in terms of actions and resource support to the participating companies as well as to students.

University internal landscape: The program managers will also help the companies to connect with the university internal landscape, mainly the students and relevant researchers (e.g., professors). Program managers need to promote the program among students and create entry points for them to join. For example, the Pilots program can **develop a student participation scheme**, listing various forms of participation with detailed information about duration, paid or non-paid, with or without ECTs, objectives, the need of professor supervision, and anticipated outcomes after the project. In this way, the startups and students can discuss and agree on the most appropriate form of collaboration. In this way, the startups and students can decide as early as possible on the necessity of involving a university professor

or not. Sometimes, the **reaching-out can be done through researchers (professors) first** with the right incentives so that the researchers (professors) can help find students to join the Pilots program with a specific startup as part of a research project.

External landscape: The Pilots program should not lock itself within the university environment. It needs to **extend its network to the outside world with many external stakeholders**. First, during the Pilot program, several startups will inevitably participate in other startup incubation programs with slightly different goals. In these cases, Pilot should provide complementary assets and support to make the startups more ready in other programs, such as Danish Tech Challenges, or InnoExplorer. Second, the Pilot program managers may have access to information about various funding opportunities that the startups are not aware of. Thus, the Pilots program can help screen information about startup funding and provide relevant support. However, that does not suggest that the Pilot program manager should directly be involved in helping startups in funding applications, which normally require a substantial number of working hours. Finally, in addition to matchmaking with an SME, startups may benefit from formal or informal collaborations with other industrial partners. Pilots project managers can draw upon their professional network and help startups search for and interact with such partners.

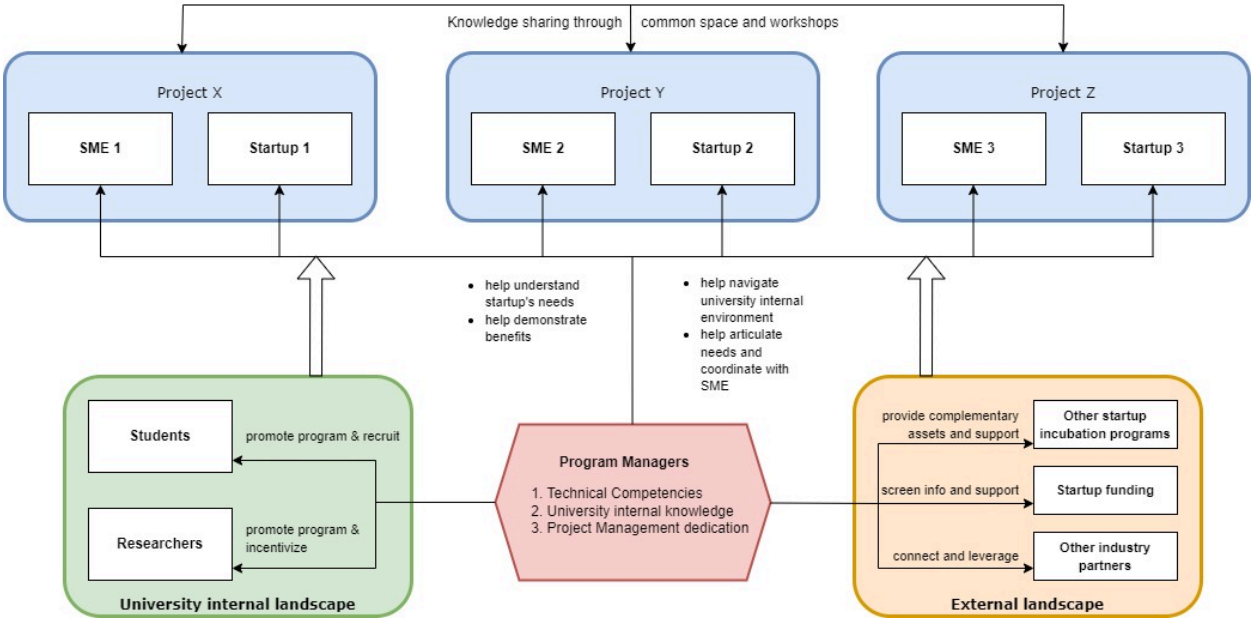

Figure 1 Pilots Model 2.0 Network Structure

Program Organization

The Pilots Program needs to be organized carefully to ensure success. Based on the collected evidence during the current version of Pilots Program, we suggest an enriched version of Pilots 2.0 program organization framework in ***Figure 2***. It shows the objectives, actions, and resources at various phases of the program. Future versions of the Pilots Program in DTU Skylab or r in other similar Danish settings (such

as the Kitchen at Aarhus University or the Innovation House at Aalborg University) is recommended to follow this organization framework.

During the **awareness** phase, the objective is to raise awareness of the program among relevant stakeholders and build up trust. The program managers must take several actions to promote the program and establish a startup database and an SME database.

During the **exploration** phase, a pool of SMEs and startups needs to be reached out. Program managers must demonstrate how participation in the Pilots program will entail mutual benefits and help define the problems to be solves and the tasks to be done through this collaboration. Concrete actions include demonstrating success cases, organizing "speed dating" workshops, and risk assessment for the companies. At this stage, resources of company onboarding templates and pre-pilot IRL test are to be used.

At the **matchmaking** phase, the goal is to set up 1:1 agreements of collaboration between a set of an SME and a startup. The program managers could also help the startups to recruit students either through paid student jobs, or through education or research projects at the university. As early as this phase, the managers should already guide the companies about how to access various types of tangible and intangible resources within the hosting university.

At the **Pilots project** phase, the startups and SMEs carry out actual development of product, technology, or market. Substantial collaborative activities are taking place. The program managers must facilitate the company's communication and provide practical support. Meanwhile, it is important to be transparent about the startups' available budget that can be used on purchasing equipment and services. At this phase, it can be helpful to provide specialized technology consulting services to the startups, if needed, and cover the expenses.

At the **Post-project assessment** phase, the program manager needs to assess the learning and progress of each SME-startup project, using quantitative measures, such as the IRL test, and qualitative interviews. It is recommended that that the assessments of all SME-startup projects are benchmarked against each other so that key success factors can be identified.

Finally, at the **Program evaluation** phase, the program managers and leadership of the hosting institute of the university need to have an overall evaluation of the whole program by collecting feedback from all relevant stakeholders and understand a broad scope of impact of the program. A program-level of KPIs are to be checked and new funding sources are to be identified for the continuous operation of the program.

Last but not least, it is recommended that a professional third-party research unit should follow the program development throughout the entire Pilot Program and collect as much data as possible to facilitate the program managers for post-project assessment and final program evaluation.

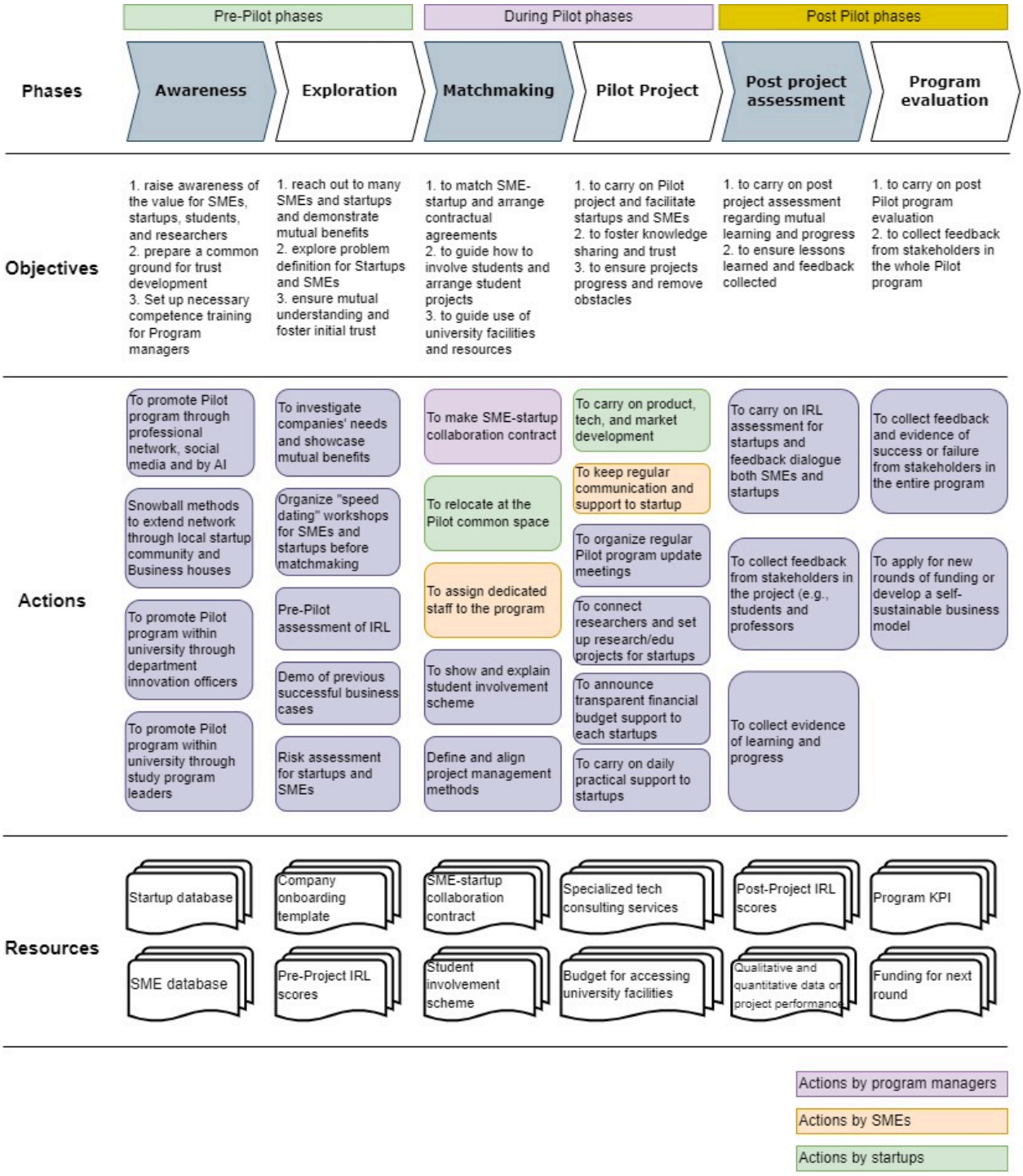

Figure 2 Pilots Model 2.0 Program Organization

Conclusion

Innovations are fostered in a complex ecosystem of stakeholders with complementary skills, knowledge, technologies, value propositions, and access to resources. Within an innovation ecosystem, intermediaries play an important role of connecting partners, leveraging value propositions, optimizing

business processes, and sometimes even leading the direction of industry innovations. Skylab Pilots is such an intermediary that has connected technology startups, SMEs, and university players (mainly students, and to a lesser degree, researchers) providing a solid platform for their interaction. A unique organizational design has been put to test during the last two years and many key lessons have been learned by the startups, SMEs, and the program managers. The impact on all stakeholders in the program has been the result of dedicated work by all partners, and continuous self-reflections among the management team throughout the project development. The insights and wisdom summarized in this report will serve the purpose of guiding partners to collaborate in a more engaging and beneficial way, as well as replicating the Pilots model in other university settings in Denmark.

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