CIRCE

Germany – Creative Impact Fund

Vertical52 – We do satellite journalism

Enriching journalistic research by facilitating the use of satellite data

Satellite Journalism
Final project report
Vertical52

2023
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Content

SUMMARY

Our goal within the project period was to test the need for a WebApp for searching, analysing, and visualizing satellite and radar data at Germany`s leading media companies and to develop a prototype iteratively with them and derive a scalable business model from it. With this project, we want to contribute to establishing satellite journalism as a separate discipline of journalistic research as an effective counterweight to propaganda and disinformation.

Where in Argentina is the soil drying up so that BMW has enough lithium for your electric car? Where in Indonesia is the jungle being burned down so that you can have Nutella on your bread? Why can you offset your flight with carbon credits from Brazil, even though trees are still being cut down there? How is the biomass of the German forest changing? Is the Yacht Andromeda visible from space anywhere?

Hundreds of stories can be forensically substantiated with data from space, intersected other data sets and tell them spatially. Far more than 8,000 active satellites are now orbiting our planet, six times more than eight years ago. While access to their data was long reserved for secret services and the military, since Putin`s invasion of Ukraine at the latest, they have been offering more and more civilian and commercial applications that also enrich journalistic research. However, most journalists do not have access to high-resolution satellite data or lack the tools to carry out more complex analyses with this data and to narrate it spatially.

Thats why we provide journalists, publishers and broadcasters with images, data and topics from space. And help them to understand, analyse and visualise them and use them to tell stories. Especially in times of fake news and AI, we want to use the possibilities of remote sensing to strengthen the veracity of journalistic research and thus its credibility. In the spirit of social entrepreneurship, we see ourselves primarily committed to the social responsibility of journalism.

Thanks to the support of the Creative Impact Fund and the CIRCE team, we developed and tested our V52 app for searching high-resolution images during the project period and brought it to market maturity. Since the start of the project, we have been able to win 15 media companies for one of our subscriptions. More than 40 stories have been published with images and analyses via our app.

We have also expanded our strategy based on the CIRCE mentoring and have developed templates for topics that can be replicated in terms of time and geography, which we can scale up. One example of this is our Gaza Conflict Tracker, which allows us to measure and visualise the number of destroyed buildings in Gaza on a weekly basis using radar data. Now that commercial satellite providers have stopped supplying high-resolution images under political pressure, this tool is a way for many media companies to still follow the war in real time and truthfully.

Another result of the CIRCE funding is the founding of the Vertical52 Academy gGmbH, in which we have bundled our new workshop offering and our non-profit activities. In addition to new sources of funding, we wanted to reach exiled media, freelancers and young professionals in particular. In December, we organized the first three training sessions with journalists in exile and are supporting our colleagues in their research from space.

With Vertical52 and the Vertical52 Academy gGmbH, we want to contribute to establishing satellite journalism as a separate discipline of journalistic research and the existence of independent media in exile as an effective counterweight to propaganda and disinformation.

OUR JOURNEY

We would love to take you with us on our journey. Here we have listed the most important milestones during the project period:

May/June

Interviews with 20 media houses about the need for satellite and radar data.

A first story by "Süddeutsche Zeitung" had been published with our support. It tracked flight data at the Airport of St. Petersburg that is co-owned by Fraport of Germany.

We clarified the strategy of the technological components and discussed them with the technical team.

We also defined the basic requirements for the human resources we require to manage the next 12 months and defined job descriptions and ways to find appropriate candidates.

July/August

We have continued to work on a first Version (V1) of the Minimum Viable Product (MVP) of our WebApp for image ordering and finalized it so that we can put it into the first beta test at the beginning of August. During this process, we made the strategic decision that in future we want to offer analysis not only on demand, but also automatically in the WebApp for replicable searches such as natural disasters.

We also launched the Vertical52 Academy gGmbH in fall. With our WebApp, we also wanted to address and reach journalists in exile, young professionals and journalism students. To this end, we have founded the Vertical Academy gGmbH, which will initially familiarise these target groups with the possibilities of remote sensing through training and workshops and provide them with an analysis tool on the WebApp with which they can also sustainably pursue their research work in the field of environmental crimes, climate change, human rights violations, etc. and visualise their results. Once the WebApp has been completed, we also want to reach journalists from countries with restricted press freedom.

We have arranged further personal customer appointments for September and have found a tool via LinkedIn Helper that will allow us to automatically start cold calling with targeted campaigns from October. From August, we hired a colleague to ramp up our social media channels in parallel with the launch of the WebApp and the relaunch of the website. In August, everything revolved around the successful beta test of the WebApp. At the same time, we redesigned the website to adapt it to the WebApp.

September/October

From September 1st, we were be part of the MediaTech Hub Accelerator program (MTHA) in Potsdam, which the MTHA will also announce via its channels. The Medieninnovationszentrum (MIZ) in Babelsberg is currently promoting its Inspiration Day

on October 5th, where we were giving a workshop for media professionals. At the Google News Summit in Lisbon on October 12th and the Uncovered Conference in Brussels on October 13th, we were scheduled for a workshop slot at each event. In September, we essentially took care of an application to the State Ministry of Culture and Media, which could fund our analysis tool for the non-profit sector.

Based on the coaching with our CIRCE mentors Christoph and Richy, we have decided to address our customers more strongly with replicable analyses from October and to organize a visualisation workshop for this purpose.

October was primarily dominated by our app launch. After the successful beta test, we presented the V52 WebApp at the Inspiration Day of MIZ and Netzwerk Recherche on October 5th and at the Web Summit in Lisbon and the Uncovered Conference in Brussels in mid-October.

November/December

We have onboarded our existing customers. After three weeks, we had 40 registrations and 12 customers in the subscription. In addition, inspired by the coaching sessions, we developed the Gaza Conflict Tracker that shows and counts damaged buildings in Gaza: With the news organisations NZZ, Handelsblatt, Correctiv, Ippen and STRG_F we were able to win several clients for this tool. And last but not least, with the JX Fund we have received a first financing commitment for our Vertical Academy gGmbH.

We still have two challenges with the visualisation of the Conflict Tracker: First, that we are not positioned in the team to build a visually sophisticated product beyond the raw data that editors can immediately and 1:1 incorporate into the Content Management System (CMS). Secondly, the fact that the good map providers such as Mapbox and Maptiler have a billing model that would quickly become too expensive for media partners with high user numbers.

During the period of November/December, we have developed a training programme to enable journalists in exile, young professionals and journalism students to discover the possibilities of remote sensing for themselves and integrate them into their research work, drawing on our experience from workshops on remote sensing that we have already held at international conferences such as the Data Harvest in Mechelen (Belgium) or the Netzwerk Recherche annual conference or as part of the curriculum of the Hamburg Academy for Journalism and the ARD/ZDF Media Academy. Our one- to three-day workshops provided an introduction to the use and research possibilities of satellite and radar data. Participants were given an overview of public and commercial satellite providers, search for satellite images and learn about the most important analysis and research tools in exercises.

With regard to the training programme, we have also strived for cooperations with the following training institutions:

Training institution	Number of trainees in project period	Letter of Interest available
Reporter ohne Grenzen	20	yes
Correctiv:lokal	20	pending
Hamburger Akademie für Publizistik	8	yes
EJC	5	yes
Journalists Network e.V.	10	yes
Holtzbrinck-Schule	12	no
OCCRP	25	pending
Axel-Springer-Akademie	10	no

INNOVATION

One of the first milestones during the Creative Impact Fund programme were our interviews with selected editors and newsrooms. We identified a clear need among editors to include remote sensing in their work in the future. However, only few of them have invested in tools or know-how to obtain access to satellite data. According to our market research, the demand can be divided into three sub-areas:

1. Fast and convenient access to high-resolution images from all relevant satellites
2. Access to analysis and research capacities outside their own editorial team
3. Access to state of the art visualisations, which can be easily integrated into the newsroom's CMS and production workflow.

When ordering high-resolution satellite images, we wanted to understand the degree to which automation is desired. This would mean that we would have to design a more complex front-end so that users could place their orders there. Here we have to pay particular attention to a differentiation from existing offers (e.g. Skywatch, Skyfi, Sentinel Hub).

As for the component visualisation of our value creation, we wanted to understand what kind of geospatial visualisations newsrooms are willing and able to integrate into their production workflow and how complex our offer needs to be build. We also wanted to understand their willingness to pay for such additional service and to what extent we are competing with existing scrolly-enabled content management systems. Our MVP will propose an embedding of satellite images in a topography, time-lapse and before-and-after animation.

Engagement / Securing of Customers for Service or Potential Follow-on Activity

We identified three newsrooms in the German market that excel in data visualizations, often pared with strong investigative capabilities. Among them are "Süddeutsche Zeitung" that took out our product as well as "Der Tagesspiegel" that is engaging with us on project-based collaborations.

Since April 2023, we have already sold subscriptions to 15 media companies, including WDR, NDR, RBB and Süddeutsche Zeitung. We need to explore avenues to increase the number of paying customers.

Customer/User Segments

We defined two user groups that we deem consistent with a targeted niche strategy that we are pursuing. These user groups are:

1. Journalists working in media outlets or as freelancer and
2. Analysts in NGOs.

The journalistic user groups follows different use-case scenarios that are layed out in the section further below.

The NGO user group is more diffuse and we have only begun to approach NGOs that have a more close affiliation to media houses and journalism.

We found in the early weeks and months of our offering that above-mentioned user groups, notably within journalism, are not always making the purchasing decision. In the news media, the purchasing decision is sometimes taken by the Editors-in-Chief or even at the management level of the news outlet.

In other cases however, notably within public broadcasting, the purchasing decision is taken by the head of the department.

User Engagement Activities

We initiated several touchpoints with our users during the first six months of Creative Impact Fund programme. The three main formats for that had been:

1. A deep dive engagement workshop
2. A light presentation, followed by a Q&A session, led by us, on their engagement and
3. Focus group interviews with specific newsrooms

With regards to the deep dive workshops, we conducted …

… an ideation workshop with Hendrik Lehman, Head of Data Visualisation at "Der Tagesspiegel" to understand the needs of his newsroom in both satellite data ordering as well as visualisation. The discussion was very helpful and gave relevant insights both for commercial as well as technical aspects. We are in the process of enlisting the support of Hendrik Lehmann as an advisor and have defined a collaboration with his media outlets.

… a visualisation ideation workshop on December 11th with a diverse group of designers that work in the gaming industry and on geospatial data. The aim of that workshop was to find bold visualisation ideas that would be suitable for newsrooms. The workshop helped to define the layout of a potential visualisation product.

We also conducted several more light engagements with European journalists to gauge the interest of different outlets in a better access and analytics tool for satellite data in journalism. Here is an overview of those meetings:

1. Presentation followed by a Q&A facilitated by us to understand user requirements during the sidelines of the News Summit Lisbon. The event was attended by 80 participants.
2. Participation in a Hackthon organised by the NGO OCCRP in Amsterdam on November 10th and 11th, where we led a team on the use of geospatial data in gold mining investigations.

With regards to focus group meetings, we engaged with the following German media outlets:

- Handelsblatt
- Süddeutsche Zeitung
- Rechercheverbund NDR/WDR/SZ
- Norddeutscher Rundfunk, Strg/F
- Kontraste, RBB
- Table Media
- Ippen Investigativ

The engagements followed an open Q&A, investigating their use of satellite data and also their tools to visualise those data sets in their newstack.

In the focus group interviews as well as during four lectures and two seminars we gave on the topic, it emerged that the vast majority of editorial offices do not have their own know-how in the field of remote sensing and only get high-resolution planetary images on a project-by-project basis. Some rely on free Planet data that can be obtained from a PR agency (with a significant time delay). Maxar images are only available to specific large media houses.

Only a few media houses (as far as we know, only Die Zeit) and journalists in German-speaking countries have made use of the Sentinel Hub. Several of the journalists we interviewed attempted to use the service for ordering images or conducting analyses, but found it overly complex for routine use in their daily editorial tasks.

In other cases, journalists told us that they have cooperated with university faculties or with start-ups to enrich their journalistic research and stories with satellite data. In both cases, there were also anecdotal reports of communication difficulties and conflicts of interest – start-ups expected a positive mention of their work and universities complained about the oversimplification of the presentation.

Some training centers and journalists` initiatives have started to close this gap and offer appropriate courses and training – we have also successfully positioned ourselves as a trainer here.

Use-Case Scenarios

Based on the engagements we conducted with journalists, NGOs and publishers, we already experienced most of the below-mentioned scenarios. The scenarios actually follow a value chain from data procurement via data analysis and visualisation to data use within the CMS (i.e. the newsstack) of a media outlet.

Our challenge is going to be to find out if it will be necessary to follow the whole value chain or if it would be more strategic to focus on one element in that value chain.

Scenario 1
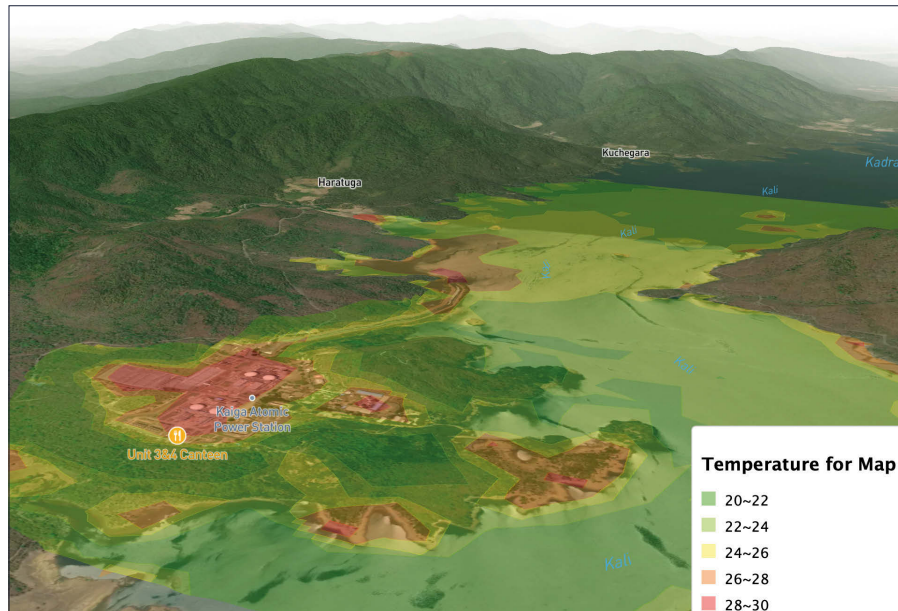
The first use case is the most common one: A news media outlet seeks to obtain satellite data to illustrate a particular news story. In our case, this occurred repeatedly. Most requests had been made by Süddeusche Zeitung that required high resolution satellite data on several occasions for their current affairs reporting. The workflow is that the newspaper is sending a mail, making a call or sending a textmessage on Signal with the coordinates and the date of the image as well as a delivery timeline.

An automatisation of that process helped us to better organize the acquisition of the satellite data from the different data providers as well as the delivery of the data to newsrooms.

In our business plan for 2024 we aim for 20 media clients that take out a regular subscription that we currently price at 6000 EUR per year, covering the purchase of 100 images.

Challenges for this scenario are the competition from professional providers of high resolution satellite data.

Immediate action needs are to improve the procurement conditions of high resolution satellite data that we are currently obtaining either through skywatch.com, up42.com or the Sentinel Hub.

Scenario 2

The second use case involves several media houses came forward with the idea to jointly investigate a topic, requiring not only high resolution optical satellite data, but rather a strong analytical capability to process medium resolution satellite data to monitor, for example, environmental degradation. Some of these requests are purely an inquiry and there is no financial support linked to it. In one case, a

political foundation asked to monitor palm oil plantations with satellites in order to understand how well anti-deforestation commitments are being implemented by companies. We undertook detailed research in Indonesia and Malaysia only to find that deforestation of primary forests had gone down significantly and the logging incidences had been greatly exaggerated by the World Resources Institute that is running the Global Forest Watch website. The media partner of that project, therefore, did not take up the story and our research was much more detailed than the provided funding would have allowed for.

Scenario 3

The third use case involves interactive visualisations we have developed for topics, that can be replicated in terms of time or geography, which can be accessed via our platform and embedded in the CMS of the editorial offices.
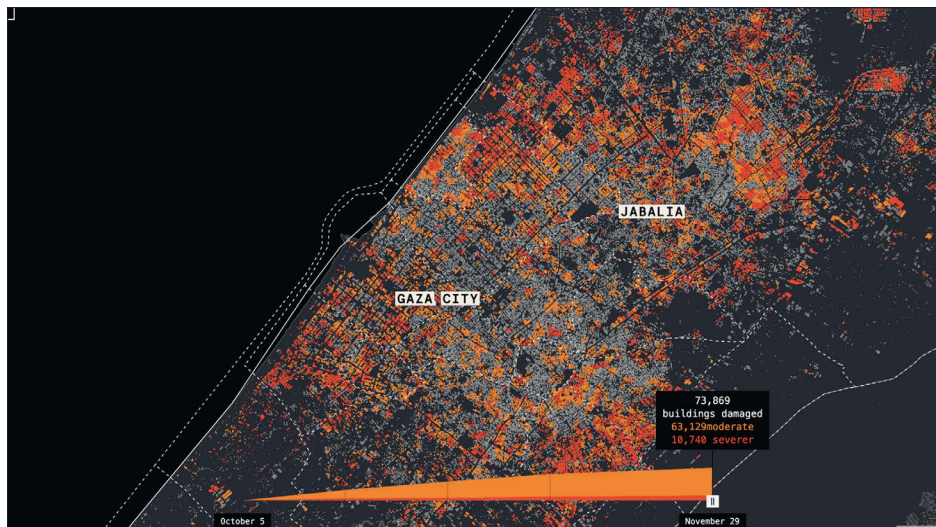
Service and System Architecture Definition

Two of the three components of our service offer will be WebApp-based: search and order of high resolution satellite imagery and visualisation and integration into newsroom CMSs.

Component 1: Web app for image search and ordering

Our eventual deliverable for component 1 is the web app with which we automate the search for and ordering of satellite images for our users. This will eventually entail connecting our app to a reseller via an API interface. The underlying infrastructure will have the following features:

1. Communication and the exchange of files between customers and Vertical52 staff are facilitated using a web application (client/server model).
2. Search requests and results as well as customer data are managed in a database that connects to a browser front end via a PHP application.
3. The PHP application communicates with a password-protected browser front end via JSON/XHR – this allows us to offer users a smooth user experience (no page reloads, fast feedback on form entries).

Component 2: Integration of spatial analytics layers

This component foresees several static and dynamic analysis layers, for example a building footprint, that can be called upon and that will be delivered into a visualisation tool. The realisation of this component will require substantial back-end engineering and API calling.

Component 3: Visualisations and CMS embedding

The WebApp will offer different forms of simple visualisation such as a timelapse, a sliders and the possibility of making satellite data spatially tangible with the help of a 3D view (currently based on a Mapbox feature).

Customers can map the satellite images ordered in component 1 or they can analyse the satellite data that vertical52 investigated for them (component 2). The visualisations themselves are developed as independent apps based on the Javascript framework Vue. The app interfaces with the Sky Observer app and the API of a WebApp service for mapping applications such as Mapbox and provides a configuration interface.

IMPACT

With Vertical52 and the Vertical52 Academy gGmbH, we want to contribute to establishing satellite journalism as a separate discipline of journalistic research and the existence of independent media in exile as an effective counterweight to propaganda and disinformation.

With the development of the WebApp, the analysis tools and the new workshop offering under the umbrella of the gGmbH, we have come a good deal closer to this goal during the Creative Impact Fund programme.

In 2023, more than 40 investigative stories were published in collaboration with us, which were based in whole or in part on our satellite research.

From 2024, we want to reach 180 journalists with our training through the non-profit academy, 30 of whom are working in exile. As a result we expect that at least 50 colleagues will register to work with the analysis tool and that the combination of training and the analysis tool will result in 20 published investigations, 10 of which will be realized by journalists in exile – as well as at least one collaborative international research project with social impact.

The partnerships we have already concluded will help us to achieve these goals. As a result, we want to raise the data and research skills of our target group to a new level and equip them with the latest geospatial intelligence tools. In doing so, we are tying in with the new discipline of Open Source Intelligence (OSINT) research, which has produced sensational research in recent years, particularly in Anglo-Saxon and Dutch journalism.

We want to use the non-profit Vertical52 Academy to develop and hone excellence in the use of satellite and radar data, initially in Germany and later on in Europe. With this project, we want to help establish the existence of independent media in exile as an effective counterweight to propaganda and disinformation.

The project also has a signal effect and is intended to encourage other journalistic media actors, especially the next generation of journalists, to participate, imitate and explain the world with Geo-OSINT. By confronting misinformation and false information with an analysis of public data, we are structurally strengthening the social function of journalism as the "fourth estate".

LEARNINGS

Even if this realisation was not entirely new to us, the support we received from the CIRCE network allowed us to experience first-hand how important and useful it is to develop innovations iteratively, ideally with our own customers. Thanks to our in-depth knowledge of the market and access to Germany's leading media companies, we were able to identify the real needs of editorial teams in this still new discipline of satellite journalism at a very early stage. As a result, we only automated those functions in our WebApp that were actually in demand.

Because our target group is very specific, we realized that we had to address our business outside Germany at an early stage and build up a European network to do so. Nevertheless, it is not easy to do pioneering work in a field in which the target group still has to be convinced from scratch because the discipline is not yet established.

Another important realisation was that our team structure is too complementary and that an employee with an IT background would do us good at shareholder level.

Lessons Learned and Conclusion

Other start-ups and academic initiatives are becoming more visible with their solutions in the same space as ours. This forces us to adapt and also to sharpen our value proposition. It also lays bare the short-comings in the team (too little coding, too few visualisation experience) and we need to address that in the half year to come.

But even if the purchasing decision is taken by the newsrooms or the head of the department (i.e. journalists that are also users), we need to understand the strategic fit of our product to the overall offer of the newsroom. To be more precise: We need to understand if a news outlet is most interested in obtaining access to satellite data or to visualise that data in a good way or to integrate it well into the CMS of the media outlet.

We have therefore reached out to the following media professionals to understand the sweet spots of our offering that are most in line with their strategic ambitions:

- STERN
- Investigate Europe
- NZZ
- Paper Trail Media
- SPIEGEL
- Deutsche Welle

We are also looking to engage international media managers in this discussion that are able to have a different viewpoint than some of the more family-run media houses in Germany:

- Media Development Investment Fund (Zurich, New York)
- Dataharvest
- Journalism Arena
- Neue Zürcher Zeitung
- dpa, German Press Agency
- Digital Haaretz (the main Israeli liberal news outlet)
- Handelsblatt

Technical Lessons Learned

A key lesson learned is that our assumption to run the WebApp on Mapbox might not be feasible due to the pricing model of Mapbox.

From a functionality point of view, Mapbox offers the best options to layer different datasets using its GL JS library. One of the options featured is a 3D view of landscapes, an example of Mapbox high-end visualisations.

However, its payment model works on tiles loaded and the nature of a visualisation that is embedded in the offering of a news media site is that for any story (be it before or behind the paywall), the clicks can skyrocket and since the offer is hosted on our account, we would not be able to control the costs.

This will be an issue to address with urgency in the first quarter of 2024 since it will strongly impact software design architecture questions.

Competitive Analysis

Our value proposition is to handhold newsrooms along the whole value chain of a satellite data-supported news report, all the way from access to analysis and visualisation that involves satellite data and geospatial information.

We therefore have a competing market for each of those segments. We have analyzed the following competitors as the main ones:

Access
A multitude of high resolution satellite provider exists and a number of brokerage WebApps aggregate their services. Key ones that we and our clients have come across are:

- Sentinel Hub
- Skywatch
- Skyfi
- up42.com
- Apollo Image Hunter

While Skywatch, singled out as the main competitor, it is not in particular targeting European media (unlike Sentinel Hub that is a tool made with a European user base in mind), we still need to constantly benchmark ourselves against Skywatch and ensure a.) a very bespoke and user-focused approach towards media houses and b.) offer an added value along the value chain of satellite data usages that media houses in the analysis and the visualisation.

Analysis and visualisation

Here, the landscape of potential competitors is less long and also more fragmented. The list is a mix of providers (GEE, Sentinel Hub) and special interest organizations that built an offer based on either of those providers. The latter category is likely to grow in the next 2–5 years. But since we are closely connected with the investigative journalistic community and the spirit of work is fairly collaborative, we will embrace new offers (such as on Bellingcat) and integrate it into our WebApp as much as possible.

LINKING BACK
TO CIRCE

Today, our interconnected world is facing numerous crises: ecological, political, and socio-economic. The challenges we encounter require innovative solutions and a fresh approach to tackling societal problems and finding new ways of living in the world. Creativity plays a crucial role as a driver of social change, as it encourages individuals to think outside the box and develop unique solutions. When people come together with a common goal, such as addressing global challenges, their diverse perspectives can lead to the creation of mutually supportive solutions across various fields and approaches.

The projects within the CIRCE network exemplify this principle, as they emphasize the importance of researching, promoting, and implementing sustainable lifestyles, which are increasingly vital in our rapidly changing world. As our project has shown, workshops can be a highly effective tool in specific circumstances, serving to raise awareness, educate the public, and obtain valuable feedback on developed solutions.

We are incredibly grateful for the approach taken by the u-institute and CIRCE in supervising our projects. The research framework provided us with a considerable amount of creative freedom, allowing us to explore, innovate, and experiment without limitations. This freedom also meant we were able to learn from failures, which proved invaluable to our overall growth and development. With this freedom came a profound sense of responsibility, motivating us to work even harder and make the most of the opportunity to refine our ideas.

The coaching sessions with our mentors, Christoph and Richy, were instrumental in our progress. Their guidance pushed us in the right direction, encouraged us to explore new avenues, and helped refine our value proposition. These sessions provided us with clarity and ensured that we stayed focused on our objectives.

The CIRCE events were an incredible source of inspiration and support. They provided a WebApp for exchanging ideas among participants in the CIRCE programme and created opportunities for learning from others who had received funding. These events also served as a valuable opportunity for self-reflection, prompting us to consider ways to enhance our project further.

In summary, the collaborative support from the u-institute and CIRCE has been truly transformative for our project. We appreciate the space they have given us for creativity and exploration, as well as the guidance and encouragement from our mentors. The CIRCE events have been instrumental in fostering a sense of community and enabling us to refine our ideas. As we continue our efforts to develop sustainable lifestyles, we are optimistic about the positive impact we can make on our interconnected world.

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