

InDEStruct: Bridge the gap between academia and industry

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What lessons can we take from the InDEStruct project, which aims to bridge the gap between academia and industry to benefit industrial knowledge, innovation and employment opportunities? What significance did the project hold for Vestas aircoil A/S? Claus H. Ibsen, PhD, Group R&D Director, provides the answers

The InDEStruct initiative was an EU-funded project to support projects through financial resources. It envisions bridging the gap between academia and industry to enhance industrial knowledge, drive innovation, and generate employment opportunities.

Our project received funding from the EU Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement.

In 2015, the Business Region MidtVest in Denmark facilitated contact with Innovayt, a company specialising in writing applications for funding. Navigating the intricate funding landscape is daunting for us at Vestas aircoil A/S. Our collaboration commenced by working with Innovayt to secure the financing of what was going to be our transition from trial-and-error to a more scientific, knowledge-driven approach.

We started the application process in 2015. The first application was rejected, and another was sent in with a revised scope, which was approved in 2017. We started the project in 2018, and in 2021, this strategic shift was facilitated by establishing the R&D Laboratory – Center of Excellence – at Vestas aircoil A/S.

The aspiration is to move beyond mere experimentation and base decisions on fundamental expertise, necessitating engagement with best-in-class resources. The overarching aim is to advance our heat exchanger technology, rendering it both superior and environmentally friendly.

We sought ambitious PhD candidates eager to contribute their knowledge, curiosity, and distinct perspectives to achieve this. Our role encompassed providing them with real-world challenges and intricacies that extend beyond conventional classroom or laboratory environments.

Identifying the objective

With the help of Innovayt, we teamed up with the University of Southampton to solve our challenge. The University of Southampton assembled a supervisory team of seven professors from diverse departments.

This arrangement fostered a unique cross-disciplinary exchange, forcing researchers from different domains to collaborate for project success. We determined that our project necessitated four PhD candidates, each specialising in each their distinct area:

- One focuses on optimising air and water flow.
- One addresses vibration from a digital and theoretical perspective.
- One examines vibration from a physical and experimental standpoint.
- One delves into material science, explicitly emphasising 3D printing options.

We are proud to say that this remarkable journey originated from the efforts of what used to be a small blacksmith company in Lem, Denmark.

Selecting the ideal candidates

Having delineated the focus areas, we drafted job descriptions. It was decided that the University of Southampton would serve as the employer, as its administrative capabilities were better suited.

However, as EU initiatives promoting researcher mobility do not allow researchers to reside or conduct their main activity in the country of the recruiting beneficiary for a period, we could not recruit students from the University of Southampton itself.

This practice acquaints researchers with diverse environments, ensuring they can address industry needs in various locations.

Consequently, we identified our candidates through a comprehensive application process – publishing the vacancies through many relevant media, including the University of Southampton job portal, ultimately selecting four PhD scholars – two from India, one from Bangladesh, and one from Brazil.

Facilitating collaboration and managing expectations

Reflecting on the present, it is a source of pride that our senior management possessed the foresight to realise this vision. Their willingness to allocate the necessary resources to this endeavour is commendable.

Yet, transforming this vision into reality is no trivial feat. It demands significant time and expertise to guide and mentor the PhD candidates throughout their journey.

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Midway reports, evaluated after approximately two years, initially left me perplexed. The content appeared overly academic, and the overarching purpose seemed elusive. But close to the end of the project, this was turned around and is now a strength of the project.

Basic research can be viewed as analogous to laying a foundation when constructing a house. While invisible in the final structure, the foundation's intricate work is indispensable. By laying this foundation, our four PhD candidates have paved the way for our current standing and future ventures.

Today, we guide our innovation by the Technology Readiness Levels (TRL), which assess technology maturity. We aim to have projects on all levels, from ideas that may or may not fly to deploying new technology.

The outcomes of the four PhD candidates have culminated in creating three novel positions within our R&D Laboratory – Center of Excellence. These roles encompass optimising water and airflow, exploring vibrations, and advancing material science. The knowledge distilled from our PhD initiatives is now seamlessly integrated into our innovation at Vestas aircoil A/S.

Utilising InDEStruct: Harnessing enhanced capabilities

Our commitment to securing funding and establishing realistic expectations has proven invaluable. The knowledge and experience from InDEStruct have been used as a launch pad for new project ideas and proposals for funding.

This expertise was recently implemented to secure funding from the Danish Innovation Foundation for an exciting project initiated in May 2023. Collaborating with esteemed researchers from Aarhus University, we participate in the CP-SENS project – a pioneering initiative to revolutionise the machine and build industry through the development of a cutting-edge digital twin platform.

Looking towards a greener future

Undeterred, we are constantly poised to embark on other EU-funded projects to steer our blacksmith industry approach toward a greener trajectory. We can bring something new to the table that will interest the EU.

Work is conducted with Professor Atul Bhaskar, this time in collaboration with the University of Sheffield and two other partners, and is centred on sustainable solutions.

We need our product development to meet the demands of the future green transition. Heat exchangers will be in demand in the future; however, limited product development on sustainability and lifecycle analysis (LCA) is on the market.

We need a holistic perspective encompassing lifecycle analysis, material innovation, and environmentally friendly materials.

InDEStruct project: Conclusion

The InDEStruct project has left an indelible mark on our company's trajectory. It has illuminated the path to innovation, transforming foundational research into tangible advancements.

The collaboration with academia has bolstered our capabilities and set us on course for a future characterised by sustainability, progress, and innovative excellence.

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