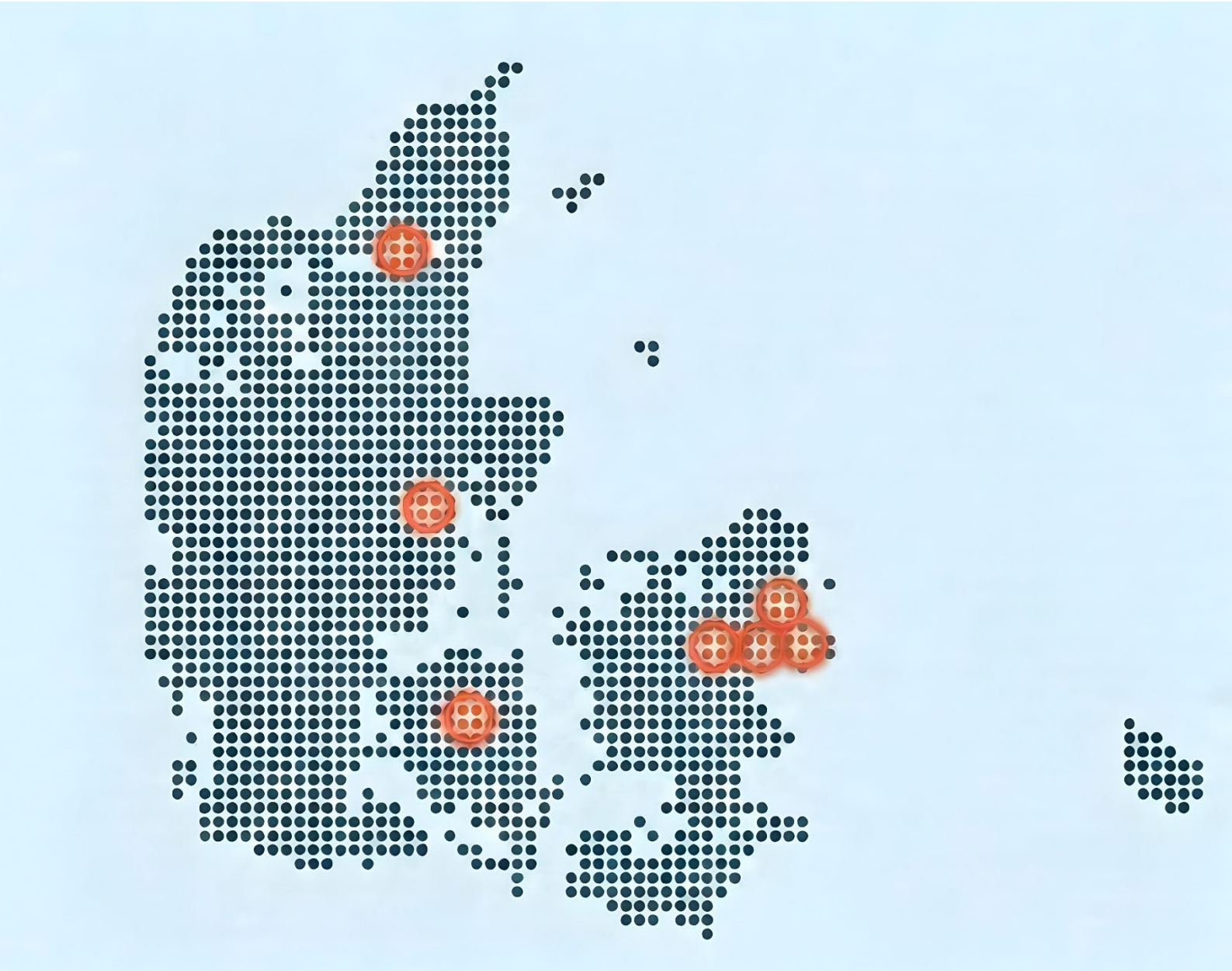
# Evaluation of Digital Research Centre Denmark (DIREC)

Prepared for DIREC
March 2026



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# 1. EXECUTIVE SUMMARY

### Background

Digital Research Centre Denmark (DIREC) was established in 2020 as a national, distributed centre for research in digital technologies. With a DKK 100 million grant from the Innovation Fund Denmark (IFD) and substantial co-financing from the eight Danish universities, the Alexandra Institute and industry partners, the Centre was tasked with the following six objectives:

1. To address the capacity challenge within Computer Science research and education for digital technologies across Danish universities;
2. To support the Government's vision of Denmark as a digital front-runner;
3. To target research and education activities towards societal challenges and value creation for both the business sector and the public sector;
4. To build on core computer science research themes and international strongholds while stimulating emerging research themes within digital technologies;
5. To expand research and education capacity in Denmark through the recruitment and development of excellent researchers at the highest international level;
6. To transform research into digital solutions and long-term digital transformation in cooperation with businesses and the public sector.

This evaluation is commissioned by IFD and carried out by IRIS Group to assess the Centre's performance and experiences during the initial five-year funding period. The evaluation draws on survey data and interviews with researchers, companies, DIREC board members and ecosystem actors, as well as data and background material provided by DIREC.

### Overall assessment

Overall, the evaluation finds that DIREC has made a substantial contribution to strengthening Danish digital research capacity and national coordination in computer science. The Centre has actively worked across all six objectives and has established itself as a recognised national platform for collaboration.

At the same time, the evaluation identifies structural characteristics that shape — and in some cases limit — the depth of integration and innovation outcomes across projects. Many of the intended longer-term effects remain plausible but cannot yet be fully assessed.

### Strong research output and broadened capacity

DIREC has delivered a high level of academic output relative to its scale, including a substantial number of peer-reviewed publications, research prototypes and a pipeline of PhD dissertations. Academic quality is widely assessed as high and comparable to international standards in computer science.

The Centre has successfully fostered collaboration across Danish computer science environments. The depth of integration varies. In some projects, collaboration is primarily organised around parallel PhD tracks with limited cross-institutional integration. In others, deeper collaboration has taken place.

A bibliometric analysis shows that approximately one in six DIREC publications is co-authored by researchers from at least two Danish universities. By comparison, the corresponding share for computer science in Denmark as a whole is only 7%.

### Innovation primarily realised through learning and early-stage exploration

A large number of companies have participated in DIREC projects, and the Centre has generated a broad range of research-based outputs such as prototypes, algorithms and demonstrators.

The evaluation shows that innovation effects are primarily realised through learning, capability building and early-stage experimentation rather than immediate commercial outcomes. Most outputs contribute to technical clarification and reduced uncertainty rather than market-ready solutions.

For companies, the main value therefore lies in access to research-based knowledge, peer-to-peer learning and exposure to new technological possibilities. In a smaller number of cases, projects are more strongly driven by company-defined challenges and demonstrate clearer alignment with innovation needs.

Overall, the ambition of combining strong scientific quality with direct applicability is only partially realised in practice. Longer-term commercial and innovation effects remain emerging.

### Substantial and nationally distributed capacity building

Recruitment of tenure-track staff, young researchers and PhD students has been substantial and nationally distributed. Beyond direct funding, DIREC has functioned as a catalyst, strengthening the strategic case for hiring and enhancing the attractiveness of Danish research environments, particularly for early-career and international researchers.

Due to structural dynamics in higher education beyond DIREC's direct influence, the goal of increasing overall enrolment in computer science programmes has only been modestly achieved. However, the growing share of female students in IT programmes represents a significant and structurally anchored improvement. Across all types of IT-related programmes, the number of female students has increased by 56%.

Educational initiatives, though limited in scale, have contributed to experimentation and knowledge sharing across institutions. Long-term impacts on research quality, labour market integration and societal value remain plausible but require a longer time horizon.

### Entrepreneurship institutionalised as a complementary dimension

DIREC has established a structured and visible entrepreneurship effort. The Young Researcher Entrepreneurship Bootcamp is widely perceived as strengthening entrepreneurial competencies and impact-oriented thinking among digital researchers. While the number of spin-outs remains limited, the activities have contributed to building awareness, skills and networks.

Entrepreneurship has thus been institutionalised as a complementary element of digital research capacity building, though achieving more ambitious long-term startup targets will require continued effort.

### A distinctive ecosystem role

DIREC is widely perceived as a national coordinating platform for computer science–based research rather than as a traditional funding instrument. Its most distinctive contribution lies in uniting all Danish computer science departments and functioning as a neutral arena in a previously fragmented landscape.

The Centre has strengthened national research networks and increased coherence and visibility. Its additionality is primarily relational and systemic: while many projects might have secured funding elsewhere, DIREC has conditioned support on cross-institutional collaboration and national coordination.

Integration with research-focused actors such as the Pioneer Centre for AI and the Danish Data Science Academy (DDSA) is described as complementary and well-functioning. By contrast, collaboration with innovation intermediaries and cluster organisations remains more uneven. Interviews point to underutilised potential in strengthening more challenge-driven collaboration and structured interfaces with cluster organisations.

International positioning remains largely indirect and mediated through project-level research output rather than through the Centre as an institutional actor.

### Governance aligned with research-driven ambitions

The distributed centre model has functioned effectively in safeguarding neutrality and preventing institutional dominance. The board provides strategic coordination, while day-to-day operations are handled by a lean and highly regarded secretariat. Satisfaction among project managers is consistently high.

Governance is strongly research-driven. This orientation has clearly supported the Centre's primary ambition of strengthening research capacity and excellence. At the same time, it has shaped industry engagement, which tends to be research-oriented and longer-term rather than demand-driven.

The workstream model has provided structural coherence and early-stage matchmaking, though its operational visibility varies across participants.

### A credible foundation – with strategic choices ahead

DIREC has delivered substantial results in research, capacity building and national coordination. At the same time, the evaluation suggests that the Centre's original ambitions — particularly regarding innovation and commercial impact — were broad and, in some respects, more far-reaching than what could realistically be achieved within a five-year, research-driven funding model.

The most clearly documented results relate to research excellence, recruitment and national integration. As the focus shifts from academic outputs toward innovation and commercial outcomes, the effects become less visible and more uneven. This reflects both the early-stage nature of many projects and the programme's strong orientation toward PhD-based research.

DIREC has therefore established a credible and solid foundation. The key question moving forward is how that foundation should be developed.

### The future of DIREC

Looking ahead, the central strategic choice concerns the balance between consolidation and expansion of scope.

One trajectory is consolidation within the digital research domain. In this scenario, DIREC would continue to prioritise national coordination, research collaboration and capacity building, while fine-tuning instruments to strengthen cross-project integration and ensure better follow-up on early research outputs. This path would reinforce DIREC's distinctive role as a neutral national platform for computer science.

An alternative trajectory would involve strengthening the research-to-innovation dimension more explicitly. This would not replace the research mission but extend it more systematically toward application and innovation outcomes. The evaluation shows that many prototypes have been developed, yet relatively few demonstrate clear commercial potential, and several promising research results remain within academia once the PhD concludes. A strengthened model would therefore focus on continuity mechanisms to ensure that promising results are not lost at project completion.

Such a development would require:

- Greater emphasis on challenge-driven collaboration and clearer alignment with company-defined needs;
- Stronger structural collaboration with innovation ecosystem actors, including cluster organisations and the strengthened innovation initiatives at Danish universities introduced under the Government's strategic priorities for research and innovation in the period 2026–2029;
- Increased use of postdoctoral positions or other instruments to extend promising research trajectories beyond PhD timelines;
- Dedicated mechanisms to support innovation follow-up, such as a structured Fast Track for Innovation programme in which promising projects could receive follow-up funding.

A more explicitly innovation-oriented model would likely require strengthened operational capacity and potentially a larger secretariat.

Whichever direction is chosen, the evaluation concludes that DIREC has demonstrated the value of a nationally coordinated, distributed centre in a strategically critical field. Future development should build on this foundation while clarifying the Centre's long-term role within Denmark's evolving research and innovation landscape.

# In its first five years, DIREC has contributed to:

## Digital research

**50** collaborative research projects initiated

**282** research papers published

**70** prototypes developed

**11** conferences held

## Digital innovation

**65** companies participating in projects

## Capacity building in the digital domain

**89** new digital researchers hired

**462** additional IT students enrolled

**56%** increase in number of female IT students

## Digital entrepreneurship

**2** startups supported

**181** young researchers taught entrepreneurship

# 2. INTRODUCTION

## 2.1 Purpose of the evaluation

Digital Research Centre Denmark (DIREC's) initial funding period concluded at the end of 2025. On this basis, Innovation Fund Denmark (IFD) has commissioned an external evaluation to document the centre's results and impact and to capture key lessons and experiences from the centre's first five years of operation.

An important purpose of the evaluation is to shed light on the learning that have emerged at the interface between research and industry, and to assess how DIREC has contributed to the development of the Danish ecosystem for digital research and innovation.

The purposes of the evaluation are summarised in the box below under three main headings.

**Purposes of the evaluation**

**1. Results and KPIs**

- Documentation of results in terms of publications, scientific impact, prototypes, innovation, capacity building, entrepreneurship, and related outputs.
- Assessment of results against the KPIs defined in the original application to Innovation Fund Denmark.

**2. Learning and value creation**

- Analysis of the value created through collaboration with DIREC for researchers and companies.
- Assessment of DIREC's contribution to collaboration across universities and companies within the digital domain.

**3. Ecosystem and positioning**

- Analysis of DIREC's role in developing the Danish ecosystem for digital research and innovation, including an assessment of the collaboration model, the function of the secretariat, and DIREC's overall positioning in relation to other actors.
- Evaluation of how DIREC contributes to and differentiates itself within the ecosystem, and identification of areas with potential for further strengthening.

## 2.2 Data sources and evaluation activities

The evaluation draws on multiple data sources, including interviews, a survey of participating researchers, case studies, and data and background material provided by DIREC. The following subsections outline the key data sources collected and used in the evaluation.

### Interviews

In total, 41 interviews were conducted (see Appendix for a full list of interviewees) with participating researchers, companies, and a diverse range of ecosystem actors.

*Interviews with research managers*

We conducted 9 in-depth interviews with research managers representing all main types of DIREC projects. The purpose was to gain insight into project organisation and results, as well as into the value of participating in a DIREC project. In addition, the interviews focused on research managers' assessments of DIREC's positioning and role within the ecosystem, as well as their experiences with grant administration and interaction with the DIREC secretariat.

*Interviews with companies*

Following the interviews with project managers, we conducted 13 interviews representing 11 companies participating in DIREC projects. The purpose was to capture the perspective of collaboration partners on project cooperation and outcomes, and to assess whether and how the results create value for the participating companies.

*Interviews with ecosystem actors*

Finally, we interviewed actors across the Danish ecosystem for digital research and innova-tion, including DIREC board members, research funding organisations, and other actors active in promoting digital research, capacity building, and innovation. These interviews focused on assessing awareness of DIREC, its integration and role within the broader ecosystem, and how effectively the centre addresses the need to connect and strengthen digital research across Danish universities.

### Surveys

A central component of the evaluation is a survey of all researchers who have participated in DIREC activities. The table below provides an overview of the survey population and response rates.

**Survey responses, DIREC researchers**

| Type | Population | Responses | Response rate |
|---|---|---|---|
| *Research managers* | *44* | *43* | *98%* |
| *Other researchers* | *178* | *66* | *37%* |
| ***Total*** | ***222*** | ***109*** | ***49%*** |

The survey addressed all three evaluation areas outlined in the box above.

In addition, a separate survey was conducted among all participants in the *Young Researcher Entrepreneurship Bootcamp* (YREB) delivered during the period 2022–2025. The table below presents an overview of the survey population and respondents across the different cohorts included in this survey.

**Survey responses, YREB-participants**

| Cohorte | Population | Responses | Response rate |
|---|---|---|---|
| *2022* | *44* | *8* | *18%* |
| *2023* | *32* | *4* | *13%* |
| *2024* | *41* | *7* | *17%* |
| *2025* | *23* | *14* | *61%* |
| *Unknown* | *35* | *9* | *26%* |
| ***Total*** | ***175*** | ***42*** | ***24%*** |

### Data provided by DIREC

Finally, the evaluation draws on material and data provided by DIREC, including data on activities, budget, participants, outputs, and results related to the defined KPI areas, as well as project descriptions and other relevant background material.

## 2.3 Evaluation framework

The evaluation is based on *the Logical Model,* which is well suited for assessments that seek to understand how a programme or centre functions and how its activities contribute to specific results and impacts. The model is particularly appropriate for evaluating complex centres involving multiple activities, stakeholders, and expected outcomes, as it provides a structured framework for linking inputs and activities to outputs, outcomes, and longer-term impacts.

Within this framework, **activities** refer to the concrete actions undertaken as part of the centre, such as funded projects, organised events, produced communication materials, recruited researchers, and delivered courses. Activity represents a necessary first step in any change process and therefore constitute an important milestone to track.

**Outputs** capture the immediate and tangible results generated by these activities. Examples include prototypes, scientific publications, acquired competencies, views of digital content, and similar deliverables. Outputs provide a direct measure of whether planned activities have been successfully implemented.

**Outcomes** represent the next stage in the results chain and refer to the direct value derived from the outputs. Outcomes may include citations of scientific publications, approval of new collaborative projects, prototypes being developed into products or services, or graduates securing employment in academia or industry.

**Impact** reflects the overarching and longer-term objectives of the centre. Potential impacts include increased competitiveness, job creation, enhanced industrial and academic reputation, and a more cyber-secure and digitally independent nation. In many cases, the activities initiated by DIREC will not be the sole contributors to observable impacts. Rather, the centre's outcomes form part of a broader set of factors that collectively contribute to long-term impact.

Moreover, the pathway from activities to impact is often long and complex and may unfold over several years. Accordingly, the focus of the evaluation has been on identifying early indications of outcomes and assessing the potential for these outcomes to translate into longer-term impacts.

Activities and output metrics have primarily been measured using quantitative indicators, drawing on both survey data and data continuously collected by DIREC. Outcomes and impacts have mainly been assessed through qualitative input from interviews and testimonials from project participants, reflecting anticipated effects from a longer-term perspective.

## 2.4 Structure of the report

The remainder of the evaluation report is structured as follows:

- **Chapter 3** introduces DIREC and its activities. The chapter also includes analyses of the distribution of projects across universities and workstreams.
- **Chapters 4–7** evaluate DIREC's contribution to four key impact areas: digital research, digital innovation, capacity building, and digital entrepreneurship. Using the Logical Model as an analytical framework, these chapters assess the quality and relevance of DIREC's activities and the extent to which they are translated into value.
- **Chapter 8** examines DIREC's role within the national ecosystem for digital research and innovation, including how the centre contributes to integration, collaboration, and Denmark's strategic international positioning within digital research.
- **Chapter 9** provides an overall assessment of the DIREC centre model, including the centre's administration and governance.

# 3. DIGITAL RESEARCH CENTRE DENMARK (DIREC)

## 3.1 Background – why DIREC?

DIREC is an independent national research and innovation organisation owned by the eight Danish universities, and the Alexandra Institute. The centre brings together researchers and companies in a joint effort to strengthen digital research and innovation in Denmark.

DIREC was established in 2020 in response to a growing need to consolidate and scale digital research capabilities across Danish universities, while at the same time strengthening collaboration with industry. Rapid technological developments within areas such as artificial intelligence (AI), data science, and digital technologies have created new opportunities, but also increased the complexity of research, innovation, and implementation. Against this backdrop, DIREC was designed to address fragmentation in the digital research landscape and to create a coordinated framework for long-term collaboration across institutions and sectors.

The overarching purpose of DIREC is to enhance the quality, relevance, and impact of digital research in Denmark by fostering interdisciplinary research collaboration, facilitating knowledge transfer to industry, and supporting the development of digital solutions with societal and commercial relevance. Through its activities and projects, DIREC aims to strengthen Denmark's position within digital research and innovation at both national and international levels.

In the original project plan for DIREC, the objectives are to[1]:

- Solve the capacity issue within computer science research and education for digital technologies across the Danish universities.
- Support the government's vision of Denmark as a digital front-runner.
- Target research and education activities towards societal challenges and value creation for both the business and public sector.
- Base DIREC on current core Computer Science research themes and international strongholds and stimulate emerging research themes for digital technologies.
- Expand the research and education capacity in Denmark via education and recruitment of excellent researchers at the highest international level.
- In cooperation with businesses and the public sector transform research into digital solutions and long-term digital transformation.

**Funding**

DIREC is funded through a combination of public funding, institutional co-financing, and contributions from industry partners. The core financial support for the centre was provided by Innovation Fund Denmark (IFD), which committed DKK 100 million to the establishment and operation of DIREC over its initial five-year funding period.

The total budget for DIREC's first funding period (2020–2025) amounts to approximately DKK 275 million, reflecting significant co-financing from the participating universities and the Alexandra Institute, as well as participating companies.

[1] Project Plan for Digital Research Center – DIREC as part of the application to IFD.

The aim of the industry engagement is to stimulate research-industry collaboration and to ensure that project outcomes maintain relevance to both academic research and practical application.

In late 2024, an additional DKK 40 million was allocated by the Danish government along with DKK 12 million from the Danish Industry Foundation to extend DIREC's core activities into 2025–2027.

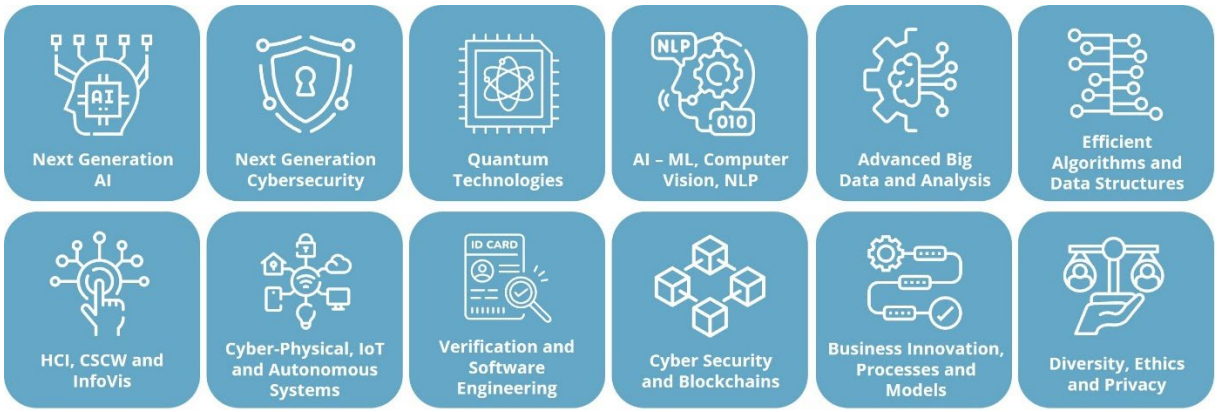
### Organisation

DIREC is organised as a national organisation with a small central secretariat and a management team comprising representatives from all partner institutions, ensuring strong local anchoring and institutional knowledge. Each research area, referred to as a *workstream*, is led by a leading researcher within the field. Each workstream manager is also a member of the management team.

Each project is linked to one or more workstreams and is led by a project manager responsible for the individual sub-project.

The figure below provides an overview of the 12 research-focused workstreams.

**Figure 3.1. DIREC's research and innovation areas**




*Source: IRIS Group based on data from DIREC*

In addition to the research-focused workstreams, DIREC includes four cross-cutting workstreams focusing on education, PhD activities, entrepreneurship, and the overall management of the centre.

DIREC is governed by a board that is responsible for the overall strategic direction of the centre and for ensuring alignment with its objectives and funding framework. The board comprises representatives from universities, industry, and relevant stakeholders.

The board plays a central role in overseeing DIREC's portfolio of activities and projects, monitoring progress against strategic objectives, and providing guidance on the centre's positioning within the broader Danish and European ecosystem for digital research and innovation.

## 3.2 DIREC activities

DIREC's activities are organised around a portfolio of projects and cross-cutting initiatives aimed at strengthening digital research, education, and innovation in Denmark. The main activity areas include:

### Research and innovation projects

DIREC supports different types of collaborative research and innovation projects, including:

- *Scitech projects,* which bring together researchers from multiple universities and focus on fundamental research problems.
- *Collaborative research projects (so-called Bridge Projects),* typically involving multiple academic partners, and participants from industry and/or public sector, and focusing on applied research.
- *Smaller exploratory projects (Explore projects),* aimed at testing new research ideas, emerging technologies, or novel collaboration formats across institutions.
- *Next Generation projects.* In 2025, DIREC initiated 14 projects within the thematic areas *Next Generation AI* and *Next Generation Cyber*, based on the additional funding from the Danish government and the Danish Industry Foundation. These projects typically involve a similar group of participants as the Bridge projects but, due to their recent initiation, are not included in the outcome and impact analyses in this evaluation.

**Education and capacity building**

- *Educational projects* focusing on strengthening education in digital technologies.
- PhD courses, summer schools, and training activities aimed at strengthening advanced digital and computer science competencies.
- Network activities for PhD students and early-career researchers across universities.
- Initiatives supporting recruitment and talent development within digital research fields.

**Entrepreneurship and commercialisation**

- Entrepreneurship training and capacity-building activities for researchers, including courses and workshops.
- Activities aimed at strengthening collaboration with university entrepreneurship ecosystems and external innovation actors.

**Ecosystem engagement and dissemination**

- Organisation of and participation in national and international conferences, workshops, and networking events.
- Activities aimed at increasing the visibility of DIREC's research and innovation outcomes.
- Engagement with public-sector actors, industry organisations, and funding bodies to strengthen the digital research and innovation ecosystem.

**Selection process**

At the establishment of the centre, approximately half of the DIREC budget was allocated to a set of pre-defined projects. The remaining budget has subsequently been distributed through open calls. These included two broad calls for *Bridge* and *SciTech* projects, as well as a more focused call for *Explore* projects aimed at early-career researchers or projects with a specific focus on climate change (see Chapter 4).

Prior to proposal submission, a series of preparatory meetings were held with the aim of fostering projects involving multiple universities and research domains. According to DIREC, these meetings facilitated a matchmaking process that enabled potential partners to form consortia before submitting project proposals.

Proposals submitted under the Bridge and SciTech calls were assessed by an evaluation committee comprising representatives from both academia and industry. The committee assessed proposals based on the following criteria:

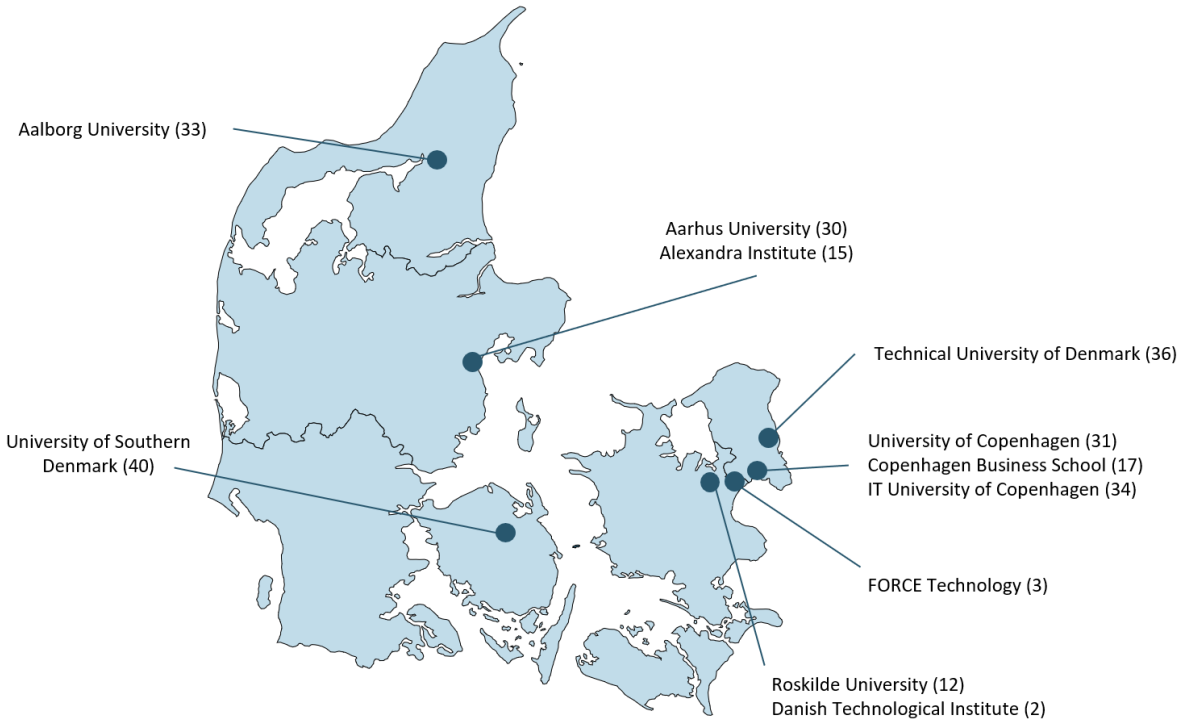
- Quality of the idea
- Quality of execution
- Expected impact

The final selection of projects was made by the DIREC board, based on the evaluation committee's scores and a recommendation from the DIREC secretariat. The selected projects were subsequently ratified by the board of Innovation Fund Denmark.

## 3.3 Profile of DIREC projects

Since the establishment of DIREC, a total of 49 projects have been initiated, involving 255 researchers and 74 external partners (as of January 2026).

**Figure 3.2. Participating researchers by institution**



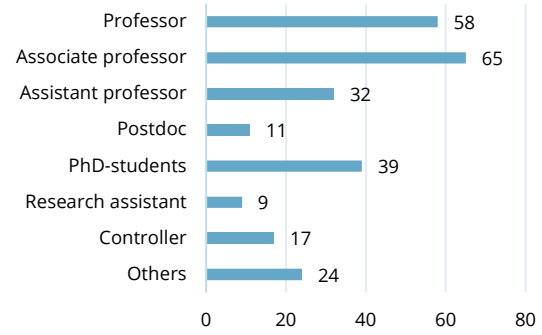

*Source: IRIS Group based on data from DIREC*
*Note: The number in the brackets indicate the number of researchers participating in DIREC-projects from each institution.*

The figure above illustrates the distribution of participating researchers across institutions. As shown, participation is well distributed across universities, with six universities each involving between 30 and 40 researchers over the period. In addition, the three GTS institutes – the Alexandra Institute, the Danish Technological Institute, and FORCE Technology – together account for 20 participating researchers.

Finally, Figure 3.3 shows the positions of the participants in DIREC projects. A total of 155 are senior researchers (professors, associate professors and assistant professors), while 50 participants were either PhD-students or postdocs.

It should be noted, however, that the figure does not reflect the distribution of time spent on the DIREC projects. In most projects, early-career researchers are affiliated with the projects for the majority of their time, whereas the time commitment of senior researchers is more limited.

**Figure 3.3. Participants in DIREC by position**




*Source: IRIS Group based on data from DIREC*

# 4. DIREC'S CONTRIBUTION TO DIGITAL RESEARCH

Maintaining and further strengthening Denmark's position within digital research is an explicit national ambition. Achieving this requires sustained development of strong research environments, interdisciplinary collaboration, and the ability to address complex and emerging digital challenges through high-quality research.

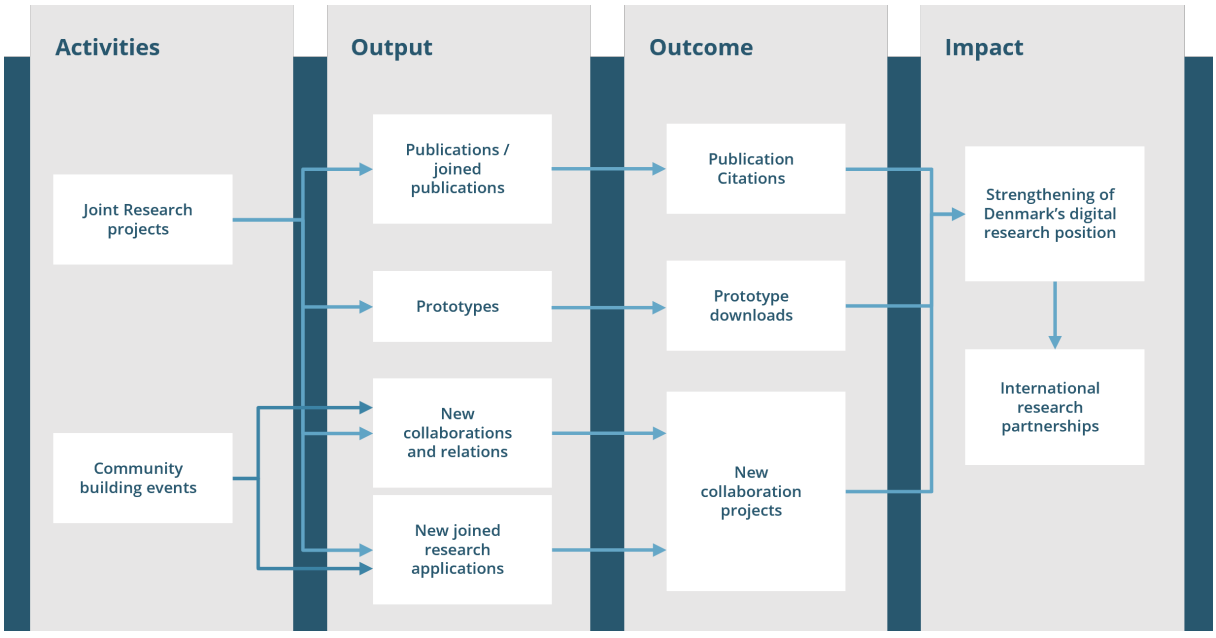
Within this ambition, DIREC aims to advance a problem-driven and interdisciplinary research approach that strengthens Danish research capacity in key areas of digitalisation. An important purpose of the centre is to bring together leading research groups to develop new knowledge, methods, and tools, within the focal areas listed in Chapter 3. By combining fundamental research with long-term, challenge-oriented perspectives, DIREC aims to support the development of new research competencies and to position Danish research at the international research frontier.

To support digital research, DIREC has primarily employed two types of initiatives.

- Funding joint research projects with participation of at least two universities and covering at least two research domains.
- Community building events to create connections among Danish researchers.

Figure 4.1 illustrates how DIREC's activities within digital research are expected to lead to specific outputs, and potential longer-term impacts on digital research in Denmark.

**Figure 4.1. DIREC's contribution to digital research in Denmark**




*Source: Based on DIREC (2023) "Midterm Evaluation of Digital Research Centre Denmark".*

The figure illustrates DIREC's intervention logic for its contribution to digital research, distinguishing between two main types of activities and their respective roles in the value creation process. Joint research projects constitute the primary driver of research outputs, generating tangible results such as scientific publications, conference papers, PhD-theses, research prototypes, etc. These outputs, in turn, are expected to lead to outcomes such as increased scientific visibility through citations, uptake and use of research outputs, and the initiation of new collaborative research projects.

Community building events are expected to play a complementary role by strengthening networks and relationships among Danish digital researchers. While these activities do not in themselves produce tangible research outputs, they aim to facilitate new research relations and collaborations, which may subsequently feed into joint research projects and future research outputs.

Together, the outputs and outcomes arising from research projects and community building activities are expected to contribute to longer-term impacts in the form of strengthened research quality and enhanced international reputation of Danish digital research environments.

At the launch of DIREC, five research-related KPIs were defined, all of which relate to either activities or outputs. As illustrated in Table 4.1, all targets had been achieved by the end of 2025.

**Table 4.1. KPI's for research**

| KPI | Status at the end of 2025 |
|---|---|
| ***40** projects initiated* | *50* |
| ***210** research papers* | *282* |
| ***19** Research prototypes* | *70* |
| ***15** PhD summer schools/joint PhD courses)* | *18* |
| ***5** conferences* | *11* |

*Source: IRIS Group based on data from DIREC*

## 4.1 Joint research projects

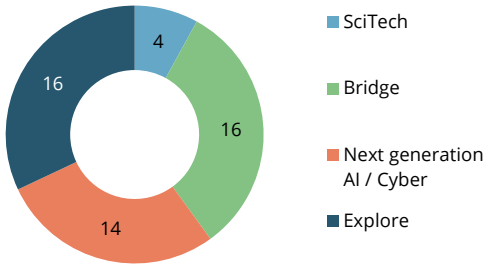
One of the primary functions of DIREC is to fund and initiate research projects. Currently, DIREC operates with four types of projects as described in Chapter 3.

While SciTech projects focus on fundamental research problems with a societal challenge perspective, bridge projects and Next Generation projects have combined research and innovation goals (see also Chapter 5).

Explore projects are smaller projects aimed at exploring new research areas or collaborations. They are also used to jumpstart young researchers' careers by serving as an initial grant.

A total of 50 research projects have been initiated. The distribution of the four types is shown in Figure 4.2.

**Figure 4.2. Distribution of DIREC research projects**

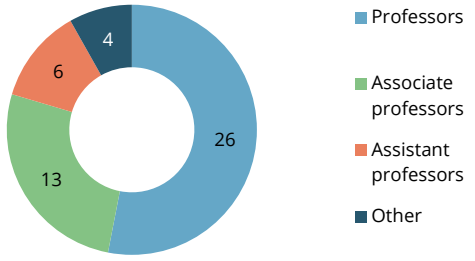



*Source: IRIS Group based on data from DIREC*

As shown, only a limited number of purely research-oriented projects have been initiated. The majority of projects, including the Next Generation projects, are expected to contribute to both strengthened research outputs and innovation outcomes.

Examining the position of the project managers, more than half are led by full professors, while approximately a quarter are managed by associate professors, cf. Figure 4.3.

**Figure 4.3. An overview of the positions of the project manager in DIREC projects**




*Source: IRIS Group based on data from DIREC*

According to DIREC, many of the projects are headed by very talented researchers in Denmark measured in terms of awarded grants such as ERC advanced grants, ERC Starting grants, and Sapere Aude grants.[2]

### Selection process

Initially, upon the establishment of DIREC, approximately half of the DIREC budget was allocated to named projects. The remainder of the initial budget was distributed through open calls: two broad calls for Bridge and SciTech projects, and a focused call for Explore projects aimed at young researchers or projects with a climate change focus.

Finally, DIREC organised two open calls for the Next Generation projects.

Prior to proposal submission, there have been organised several meetings with the goal of creating projects that include multiple universities and research domains, resulting in a match-making process before the project proposals were submitted.

The Bridge, SciTech and Next Generation projects submitted to DIREC have been assessed by an evaluation committee comprising members from both academia and industry.

The committee have used the following criteria: 1) Quality of idea, 2) Quality of execution and 3) Impact. The final selection of projects was made based on the committee's scores and a recommendation from the DIREC board, which was then ratified by the board of Innovation Fund Denmark.

### Output – high academic production

Table 4.2 shows the total academic output from the DIREC projects by the end of 2025. As illustrated, the projects have resulted in 62 academic journal articles and 174 conference papers (which typically constitute a substantial share of academic output within computer science).[3] In addition, centre activities have resulted in 5 PhD theses. This number will increase significantly in 2026, as several PhD projects has not yet been completed.

**Table 4.2. Academic production in DIREC projects**

| Publication type | Count | Percentage |
|---|---|---|
| *Conference paper* | *174* | *62%* |
| *Journal paper* | *62* | *22%* |
| *Workshop paper* | *11* | *4%* |
| *PhD thesis* | *5* | *2%* |
| *Book/Book chapter* | *4* | *1%* |
| *Master thesis* | *2* | *1%* |
| *Other* | *24* | *8%* |
| ***Total*** | ***282*** | ***100%*** |

*Source: IRIS Group based on data from DIREC*

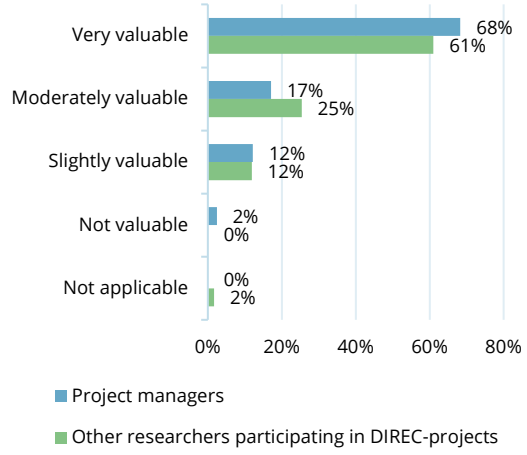
It is also expected that the number of scientific publications will increase further during 2026, as there is typically a time lag associated with journal publication due to peer-review and editorial processes. Overall, the level of scientific output is assessed to be high and satisfactory.

[2] Midterm Evaluation of DIREC

[3] Within computer science, peer-reviewed conference papers play a central role in scholarly communication and are often considered equivalent to journal publications in terms of scientific significance. Many of the leading research contributions in the field are published at highly selective international conferences, where acceptance rates are low and the review process is rigorous.

In the survey of DIREC researchers, participants were also asked to assess how valuable the projects have been for their research. As shown in Figure 4.4, approximately two thirds of the researchers report that the projects have been "very valuable", with the share being slightly higher among project managers.

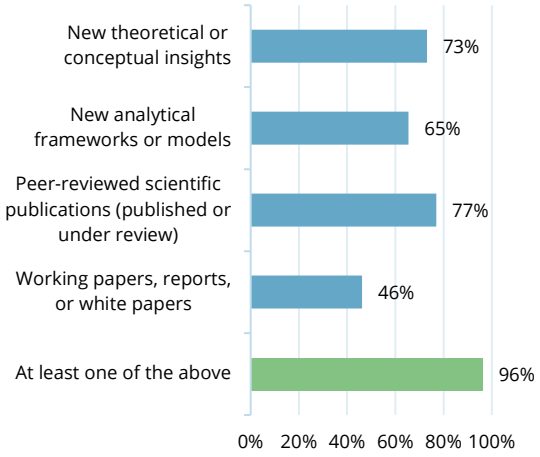
**Figure 4.4. How valuable has the DIREC project been for your research and professional development?**




*Source: Survey of researchers participating in DIREC activities*
*Note: N=41 for project managers, N=59 for other researchers.*

The results therefore suggest that the projects contribute to strengthening research in many of the supported environments. This is further supported by responses to a question posed to project managers regarding whether the research has led to new scientific knowledge, insights and methods. As shown in Figure 4.5, approximately three out of four project managers report that the projects have resulted in new theoretical or conceptual insights.

**Figure 4.5. Share of DIREC projects that have generated research output**




*Source: Survey of researchers participating in DIREC activities*
*Note: N=26.*

### Research quality and interdisciplinarity in the DIREC projects

Interviews with project managers involved in the DIREC projects, as well as with ecosystem actors, provide a broadly consistent picture of the research quality achieved within the centre. Overall, both groups assess the academic quality of the DIREC projects as high, while also pointing to structural and design-related factors that in some cases constrain the full research potential.

From the perspective of researchers/project managers, the projects are widely described as academically solid and methodologically rigorous, producing research at a level comparable to international computer science standards. Several project managers emphasise that the projects have led to new scientific knowledge and theoretical insights, and the development of new methods and analytical tools.

In particular, SciTech projects and research-driven Bridge projects are highlighted as having supported in-depth research and contributed to peer-reviewed journal articles in highly ranked journals. Researchers also note that the DIREC framework has enabled them to pursue research questions that are exploratory, interdisciplinary or high-risk,

which may be more difficult to accommodate within more rigid funding schemes.

Both researchers and ecosystem actors highlight interdisciplinarity as a key dimension of the DIREC projects. The interviews indicate that interdisciplinarity is most clearly realised through collaboration across universities and across subfields within computer science, such as artificial intelligence, software engineering, human–computer interaction and cybersecurity. This form of horizontal interdisciplinarity is widely regarded as a strength and as contributing positively to research quality. At the same time, both groups note that broader cross-disciplinary integration with social sciences, humanities or legal studies is less prevalent.

With regard to societal challenges, both researchers and ecosystem actors emphasise that many DIREC projects are oriented towards addressing issues of high societal relevance. Researchers describe these challenges as important sources of inspiration for research questions, while ecosystem actors see them as enhancing the relevance and legitimacy of the research. However, the interviews also suggest that societal challenges often function primarily as a technological framing or context, with research contributions remaining narrowly focused on technical solutions in specific areas.

Alongside these positive assessments, both researchers and ecosystem actors point to structural factors leading to variations across projects. A recurrent theme in the interviews is that a substantial share of DIREC funding has been allocated to PhD positions. While this has clearly contributed to research output, capacity building and the training of new researchers, it has also shaped project structures in ways that tend to favour relatively narrow and well-defined doctoral research trajectories. In practice, this has meant that many projects are organised around parallel PhD tracks.

Several interviewees note that, although this structure supports depth and quality at the level of individual research contributions, it often comes at the expense of broader integration, synthesis and collective knowledge development across partners and work packages. The interviews consistently point to limited prioritisation of transversal knowledge sharing and joint scientific reflection in some of the projects. While a small number of projects are described as actively fostering cross-project interaction, shared conceptual frameworks and collective learning, the predominant pattern is one of loosely coupled research activities with relatively limited coordination beyond initial meetings and informal dialogue (see also Section 4.2).

### Bibliometric assessment of scientific impact

The outcome and quality of DIREC's research can also be assessed using bibliometric indicators, such as citation counts and publication in highly ranked journals. However, there are several challenges associated with applying bibliometric measures in this context.

First, citation counts take time to accumulate, and a large share of DIREC's publications have been produced within the past few years. Second, computer science differs from many other research fields in that a substantial proportion of research output is published as peer-reviewed conference papers rather than in traditional journals. This limits the relevance of indicators based solely on publication in high-impact journals. Third, DIREC publications also appear in journals outside the core field of computer science, making it difficult to define appropriate and consistent reference groups.

In light of these considerations, the most meaningful approach is to focus on publications in computer science journals and conference proceedings and to use citation-based indicators as measures of research impact. On this basis, a bibliometric analysis has been conducted covering 127 DIREC publications within computer science from the period 2022–2025[4]. These publications

[4] We have excluded articles that fall within other subject areas or could not be identified in the SciVal database.

have been benchmarked against overall computer science research output in Denmark and Europe during the same period. The results are presented in Table 4.3.

**Table 4.3. Scientific impact, 2022-2025**

| | DIREC | Computer Science, Denmark | Computer Science, Europe |
|---|---|---|---|
| *Share of articles that has been cited* | *84%* | *73%* | *69%* |
| *Average no. of citations per article* | *6.8* | *8.4* | *6.5* |
| *Share of publications among the 10% most cited* | *24%* | *16%* | *12%* |

*Source: IRIS Group based on data from DIREC and Scopus*
*Note: Scientific publications include articles, reviews and conference within the field of Computer Science.*

As shown, DIREC performs well across the three bibliometric indicators. Both in terms of the share of cited publications and the proportion of publications among the top 10% most cited, DIREC performs above the Danish average for computer science. Across all indicators, DIREC performs above the European average. Only with respect to the average number of citations per publication does DIREC fall slightly below the Danish average.

It should be emphasised, however, that citation indicators reflect only an early stage of impact, given the limited time since publication for many articles. The results should therefore be interpreted as preliminary indications. It would be appropriate for DIREC to continue monitoring developments on these indicators over time.

### DIREC's role in balancing research priorities

Interviews with both researchers and ecosystem actors highlight DIREC's contribution to a more balanced allocation of research funding across institutions and key areas of computer science. A recurring point in the interviews is that, unlike traditional research centres, DIREC has been able to take a more holistic view when prioritising projects, considering not only the quality of individual proposals but also the overall composition of the research portfolio. Several interviewees emphasise that this has enabled DIREC to support a broader range of research environments and thematic areas than would typically be the case in competitive, proposal-driven funding schemes.

Both researchers and ecosystem actors note that this portfolio-based approach has helped mitigate structural imbalances in the Danish computer science landscape, where funding often tends to concentrate around a limited number of strong groups or fashionable research topics. In contrast, DIREC is perceived to have deliberately ensured representation across universities and across central subfields of digital research, thereby strengthening the national research ecosystem as a whole.

At the same time, some interviewees underline that this broader prioritisation logic has implications for how research quality and coherence are realised at project level. While the approach is widely viewed as appropriate from a system-level perspective, some stakeholders point out that balancing across environments and themes can come at the cost of concentrating resources in fewer, larger projects with greater critical mass. Nevertheless, the interviews suggest a broad consensus that DIREC's ability to prioritise strategically at centre level constitutes a distinctive and valued contribution compared to traditional funding instruments, particularly in terms of strengthening capacity, diversity and long-term resilience within Danish computer science research.

### Further funding and follow-up research trajectories

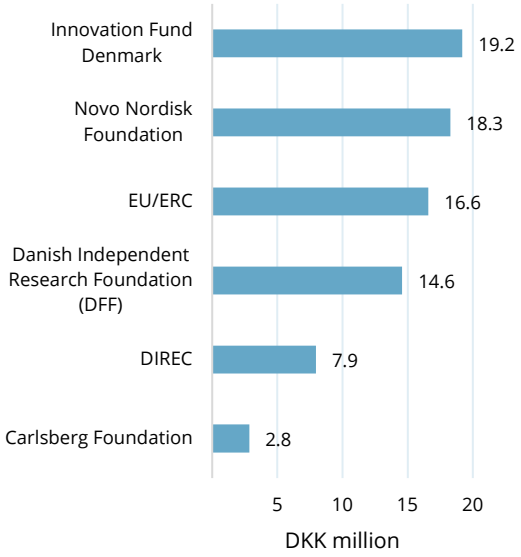
Interviews with project managers indicate that DIREC funding has, in some cases, contributed to the development of new research ideas and subsequent research trajectories, with considerable variation across projects. In particular, project managers involved in Explore projects describe the funding as important for clarifying research questions, testing early-stage concepts and identifying promising directions for further research.

In a few cases, SciTech and Bridge projects are also reported to have informed later applications for national research funding or support from private foundations. Some project managers report that the projects have supported the continuation or expansion of existing research lines and contributed to follow-up funding applications, often linked to individual PhD projects or specific subthemes. Others note that the projects were primarily designed to deliver defined research outputs within the project period, with more limited emphasis on positioning the work for subsequent funding.

According to DIREC's own reporting, follow-up funding amounting to a total of DKK 79.4 million had been secured by the end of 2025 in connection with the projects. This funding is distributed across 11 grants and six DIREC projects. Of this amount, DKK 8.0 million relates to internally funded projects, where Explore projects have resulted in larger DIREC grants.

Among the remaining grants, three large awards dominate, totalling DKK 52.5 million, from the Novo Nordisk Foundation (see the case on *Explain Me* following Chapter 7), the European Research Council (ERC Consolidator Grant), and Innovation Fund Denmark. In addition, four grants totalling DKK 14.6 million have been obtained from the Danish Research Council (DFF).

**Figure 4.6. Further funding by sources**




*Source: IRIS Group based on data from DIREC*

As a large share of the projects conclude with PhD dissertations, there is a general risk that follow-up research activities, including further development of early-stage prototypes, are not prioritised. In this context, DIREC could place greater emphasis on career pathways, including postdoctoral positions, for early-career researchers associated with projects where there is clear potential to develop new research trajectories and establish new research groups.

### Box 4.1. Examples of research outcomes from DIREC projects

**New methods and tools for security analysis**
A Bridge project on secure IoT systems resulted in the development of formal models and analysis tools for assessing security risks in complex, distributed IoT architectures. The project generated multiple PhD dissertations and peer-reviewed publications, and the tools developed are used as a foundation for continued research on secure and verifiable systems.

**Data reuse and research frameworks for robotics in production**
An Explore project on reuse of robotic data in industrial production focused on understanding

how heterogeneous robot data can be systematically collected and reused. While limited in scale, the project produced conceptual frameworks and research insights that directly informed a subsequent large-scale national research grant, enabling continuation of the research in a significantly expanded setting.

**Computer vision and data-driven tools for infrastructure and sustainability research**
A Bridge project involving public infrastructure data led to the development of computer vision methods for detecting and monitoring road signs, as well as data-driven models for estimating $CO_2$ emissions from traffic. The project produced research prototypes and analytical models that reached a relatively high level of technological maturity and continue to be used as a basis for further academic research.

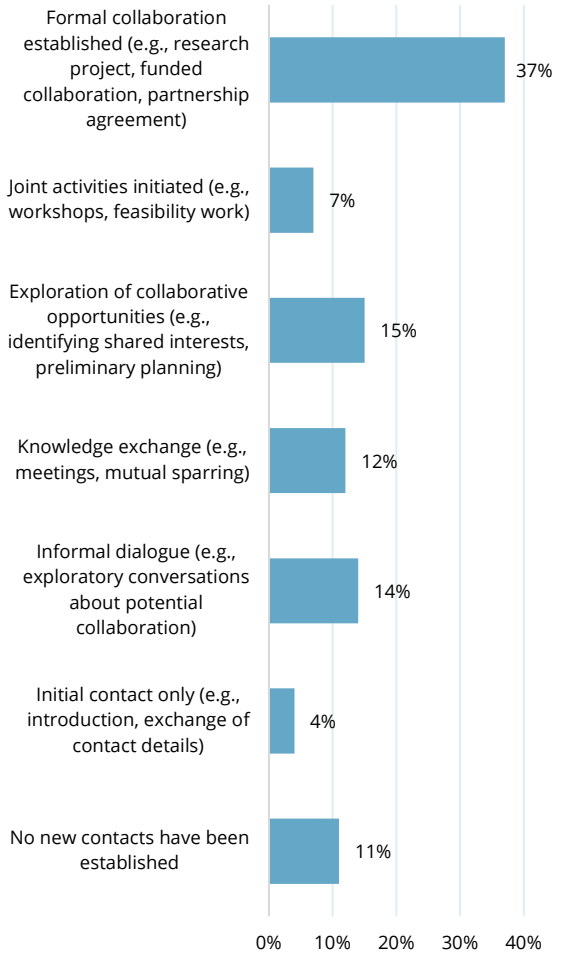
## 4.2 Community-building events – what are the outcomes?

Another key objective of DIREC, and a central driver of the centre, is to promote collaboration across institutions and research domains. The aim is to foster stronger networks among researchers in Denmark.

As shown in Table 4.1 in the beginning of the chapter, the number of events exceeds the corresponding KPI target by more than 100%, indicating that DIREC has placed strong emphasis on this area. Chapter 8 provides a more detailed discussion of DIREC's efforts to strengthen the ecosystem for digital research in Denmark.

As illustrated in Figure 4.1, the underlying logic is that building new relationships across researchers and research environments can lead to joint applications and collaborative projects. The evaluation shows that DIREC has contributed significantly to strengthening networks among researchers within the digital research domain and has facilitated the establishment of project collaborations between researchers from different environments who had not previously collaborated. This is reflected in Figure 4.7.

**Figure 4.7. New research collaborations established through DIREC**




*Source: Survey of researchers participating in DIREC activities*
*Note: N=108. The researchers were asked to state the highest level of engagement reached due to DIREC-participation.*

The figure shows that, among the researchers who responded to the survey, almost 90% report having established new relationships with other researchers through DIREC. Of these, 37% indicate that the new relationships already involve formal project collaboration, while a substantial share report having initiated collaboration that may lead to joint research projects in the future.

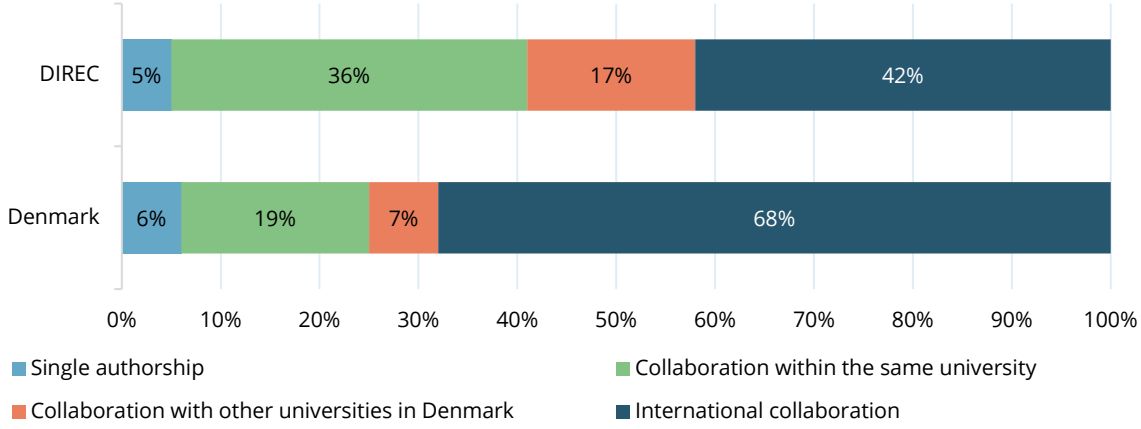
The survey results also show that DIREC has contributed to strengthening existing relationships. Specifically, 78% of the researchers report that DIREC has strengthened existing relationships with

other research environments to a high or some extent.

DIREC's contribution to collaboration across researchers and research environments can also be assessed through the extent of academic publications co-authored by researchers from multiple universities.

Figure 4.8 compares DIREC with computer science research in Denmark more broadly with respect to collaboration patterns. The figure shows that a larger share of DIREC publications is authored by researchers collaborating within the same institution. At the same time, a notable share of DIREC publications – approximately one in six – are co-authored by researchers from at least two Danish universities (without international co-authors). This suggests that DIREC has contributed to strengthening research collaboration across Danish universities.

**Figure 4.8. Collaboration in DIREC-research compared to computer science in Denmark as a whole**




*Source: IRIS Group based on data from DIREC and Scopus*
*Note: Scientific publications include articles, reviews and conference within the field of Computer Science. In the classification applied, international collaboration is given priority over collaboration across Danish universities. As a result, publications categorised as international collaboration may also include co-authors from multiple Danish universities.*

### Collaboration across research environments: varying depth and integration

Overall, the interviews suggest that collaboration across research environments has the potential to contribute positively to research quality, but that this potential is only partially realised in practice. While several interviewees describe benefits related to access to complementary expertise and broader perspectives, these effects are neither uniform nor systematic across projects.

In a subset of projects, researchers note that collaboration across institutions has provided access to specialised competences or perspectives that were not available within a single research environment. In these cases, interviewees describe value in early-stage discussions, feedback on problem formulations or methodological choices. However, such effects are typically linked to specific interactions between individual researchers, rather than to structured or ongoing cross-institutional knowledge integration at project level.

At the same time, and already mentioned, a recurring observation across the interviews is that many projects are organised around parallel research tracks, often centred on individual PhD projects at different institutions. In these cases, collaboration across environments is described as relatively loose, with limited joint analysis, synthesis or co-development of research. Several interviewees note that interaction across institutions is often confined to periodic meetings or formal coordination, rather than continuous scientific exchange. As a result, the contribution of cross-

institutional collaboration to research quality is perceived as modest and indirect in these projects.

The interviews further indicate that while cross-institutional collaboration can support interdisciplinarity within computer science, this typically occurs at the level of project design or consortium composition, rather than through deep, ongoing integration of research activities. Broader interdisciplinary learning and critical scientific challenge across environments are described as the exception rather than the norm, and depend strongly on project leadership, individual initiative and available time and resources.

Taken together, the interviews suggest that collaboration across research environments has strengthened research quality in some projects, particularly through targeted exchanges and access to complementary expertise. In a number of projects, the collaboration has primarily taken the form of coordination across partners, with more limited integration of research activities. This suggests a potential for further strengthening knowledge sharing and deeper collaboration across institutions in future projects.

## Key takeaways

**Strong and measurable research output**

- 50 collaborative research projects have been initiated across Danish universities.
- 282 research papers have been published, including publications in highly ranked journals.
- DIREC performs strongly across bibliometric indicators for impact, exceeding both Danish and European averages for most measures.

**Development of research-based prototypes**

- 70 prototypes have been developed within DIREC projects.
- Prototypes primarily represent research-based tools and early-stage technological solutions.
- Many serve as foundations for continued academic research and further development.

**National collaboration embedded in project design**

- Cross-institutional collaboration is a defining feature of DIREC's research model.
- 17% of DIREC supported publications involve multiple Danish universities, compared to a 7% average in Danish computer science.

**Community-building as a research multiplier**

- 11 conferences have been held, alongside numerous seminars and networking events.
- Community-building activities are designed to stimulate new collaborations, knowledge exchange, and future joint funding applications.

**Leveraging follow-up research activity**

- DIREC projects have contributed to attracting additional external funding and initiating new research trajectories.
- Smaller exploratory initiatives have, in several cases, enabled larger subsequent research grants.

# 5. DIREC'S CONTRIBUTION TO DIGITAL INNOVATION

Digital technologies have become a decisive driver of productivity, competitiveness, and long-term value creation across virtually all sectors. Advances in areas such as artificial intelligence, data analytics, machine learning, and software engineering are transforming business models, production processes, and decision-making across sectors. For companies, the ability to adopt, adapt, and further develop digital technologies is increasingly critical to remaining competitive in global markets.

At the same time, the growing complexity and rapid evolution of digital technologies have increased the importance of close interaction between research and innovation. Cutting-edge digital research often takes place at the frontier of scientific knowledge and requires specialised competencies and interdisciplinary collaboration. Its translation into practical applications therefore depends on effective mechanisms for knowledge transfer and interaction between universities, companies, and public-sector actors.

There are several pathways through which digital research contributes to innovation and value creation:

- **Knowledge transfer through education and employment**. A key pathway for utilising digital research is the transfer of knowledge through graduates and PhD students who move from universities into companies and public organisations. These individuals bring with them research-based digital skills, methods, and analytical approaches, which can be directly applied in innovation activities, and the adoption of new digital technologies.
- **Collaborative research and innovation projects.** Digital research can be translated into innovation through joint research carried out in collaboration between universities and external actors. Such projects enable companies and public organisations to engage early with emerging digital knowledge, while researchers gain access to real-world problem settings, data, and application contexts.
- **Entrepreneurship and commercialisation.** A third pathway involves the creation of new companies based on digital research results. Through entrepreneurship, research-based knowledge can be transformed into new products, services, and business models (this pathway is addressed separately in Chapter 7).

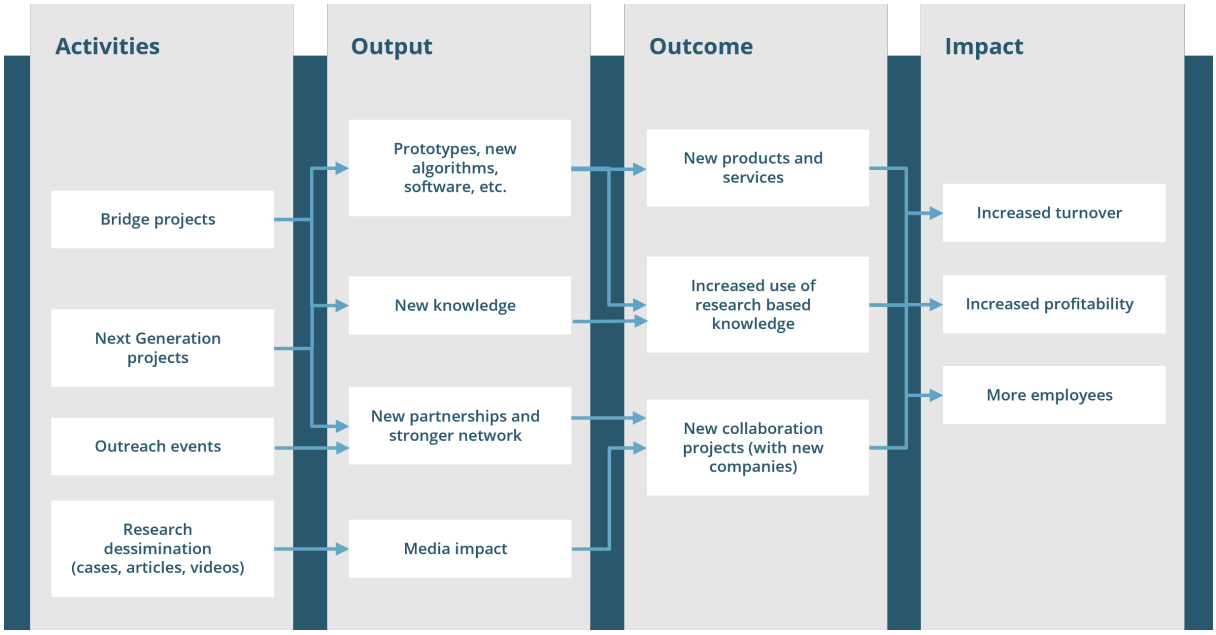
Within DIREC, collaboration between universities and external actors has primarily been realised through *Bridge projects*[5]. Bridge projects are collaborative research projects carried out in collaboration between universities and external partners. The aim has been to design projects that connect digital research with concrete innovation needs by combining strong scientific ambition with a clear focus on applicability and use.

As such, Bridge projects constitute a key instrument through which DIREC seeks to strengthen digital innovation in Denmark.

Figure 5.1 illustrates how DIREC's activities within digital innovation, most notably Bridge projects, are expected to lead to specific outputs, and potential longer-term impacts within the digital innovation ecosystem.

[5] Since 2025, also through the so-called "Next Generation projects"

**Figure 5.1. DIREC's contribution to digital innovation in established organisations**




*Source: Based on DIREC (2023) "Midterm Evaluation of Digital Research Centre Denmark".*

Joint research projects constitute the core activity, linking collaborative research efforts to concrete outputs such as prototypes and new knowledge, which in turn are expected to support outcomes including increased use of research-based knowledge and the development of new products, services, and follow-on collaboration projects. These outcomes are expected to contribute to longer-term impacts in terms of improved competitiveness and productivity.[6]

In addition to collaborative research projects, dissemination and outreach activities play an important supporting role in the expected effect chain.

Outreach events and communication activities aim to help raise awareness of research results, to facilitate knowledge sharing beyond individual projects, and support the formation of new collaboration opportunities. As such, outreach is expected to contribute to broadening the reach and impact of DIREC's activities beyond the immediate project participants.

Six innovation-related KPIs have been defined for DIREC, which relate to different parts of the effect chain in Figure 5.1. Table 5.1 provides an overview of the KPI's and the target achievement.

[6] As shown later in the chapter, for most projects the primary contribution to outcomes relates to increased use of research-based knowledge, while only a limited number of projects result in prototypes that are translated into new products. As the integration of new knowledge within companies often takes time, it is too early to assess DIREC's long-term impact on innovation, job creation and related effects in the business sector.

**Table 5.1. DIREC KPI's for innovation and company engagement**

| KPI | Status at the end of 2025 |
|---|---|
| *52 companies involved in DIREC-projects* | *65* |
| *37 industry courses, seminars and workshops* | *28* |
| *14 proposed solutions formulated and tested* | *28* |
| *Expected increased turnover in companies = 200 MDKK* | *?* |
| *150 new employees in partner businesses* | *?* |
| *18 new PhDs employed in Danish businesses* | *4** |
| *20 yearly newsletters* | *45* |

*Source: IRIS Group based on data from DIREC*
*Note: *Currently, DIREC only has data on 11 PhD graduates, of whom 4 are employed in industry. For the remaining individuals, information is either unavailable, or they are still in the process of completing their PhD or seeking employment.*

As shown in the table, the degree of target achievement varies considerably across the KPIs. With 65 companies participating in DIREC projects, the target for company involvement has been exceeded by a substantial margin, whereas the number of industry courses, workshops and seminars held is somewhat lower than initially expected. Part of the explanation is that, rather than organising a large number of separate events, DIREC has prioritised consolidating its dissemination efforts towards industry through the Digital Tech Summit.

DIREC has further reported that companies involved in the projects have developed and tested a total of 28 solutions (e.g. prototypes) as part of the project activities, which is twice the original KPI target. However, based on the interviews, this figure appears to cover a broad range of outputs, including some prototypes where company involvement has been limited and where there are no immediate plans for further development or commercialisation.

Table 5.1 indicates that the number of PhD graduates employed in industry remains relatively modest. This should, however, be seen in light of the fact that many PhD projects had not yet been completed by the end of 2025.

DIREC has also defined targets related to the projects' impact on employment and turnover in participating companies. At this stage, it is too early to assess progress against these targets, and a meaningful assessment would require more in-depth analysis to isolate effects that can be attributed specifically to the DIREC projects.

However, as reflected in the remainder of this chapter, there are examples of projects involving participating companies that plan to initiate larger innovation or development activities based on results from the DIREC projects, although the level of interest remains modest. Apart from the DIREC-based spin-outs (see Chapter 7), continued collaboration or interest in further development has currently been identified in 10 companies.

## 5.1 Bridge projects – activities and output

To date, a total of 16 Bridge projects have been initiated or completed under DIREC, along with 16 smaller Explore projects, some of which also involve companies.

Bridge projects typically span a period of 3-4 years and serve a dual purpose according to DIREC: to advance state-of-the-art digital research while simultaneously addressing concrete challenges faced by participating organisations.

The combined budget for the 16 Bridge projects amounts to approximately DKK 195 million, of which DIREC has contributed DKK 63 million. All Bridge projects are co-financed, with funding jointly provided by the participating universities

and external partners[7]. In addition to the Bridge projects, 14 projects were launched in 2025 under the thematic initiatives *Next Generation AI* and *Next Generation Cyber*.

In total, 74 external actors have participated/participate in the projects. The majority of these are private companies (65), but participation also includes public organisations (such as hospitals), research and technology organisations (GTS-institutes), and utility companies. The participating companies represent a broad range of industries, encompassing both large enterprises and smaller companies, as illustrated in the overview below.

**Table 5.2. Participating organisations**

| | |
|---|---|
| *Private companies (more than 50 employees)* | 41 |
| *Private companies (less than 50 employees)* | 24 |
| *Public organisations* | 7 |
| *Research and Technology Organisations (GTS-institutes)* | 2 |
| ***Total*** | 74 |

*Source: IRIS Group based on data from DIREC*

Most projects originate from ideas or problem formulations developed within the research environment or emerge through dialogue between researchers and companies. By contrast, relatively few projects are primarily initiated on the basis of needs or challenges defined by companies alone (according to the project managers).

This pattern is illustrated in Table 5.3, which shows the reported origins of project ideas and distinguishes between Bridge projects, Next Generation projects, and other types of projects supported by DIREC.

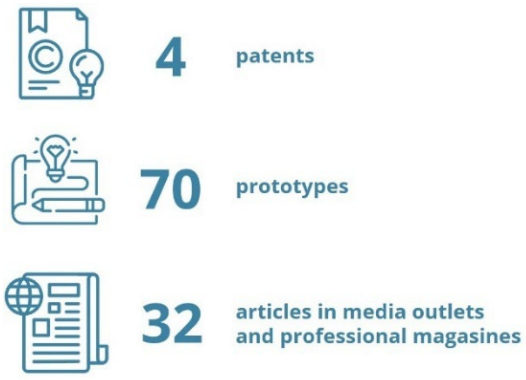
**Table 5.3. Origin of project ideas**

| | Bridge | Next Generation | Other projects | Total |
|---|---|---|---|---|
| *From a company challenge* | *2* | *0* | *0* | ***2*** |
| *From a research question* | *4* | *8* | *9* | ***21*** |
| *It was formulated jointly between company and researchers* | *7* | *2* | *1* | ***10*** |
| *It came from another actor* | *2* | *1* | *0* | ***3*** |
| *Other* | *0* | *0* | *1* | ***1*** |

*Source: Survey of researchers participating in DIREC activities and data from DIREC*
*Note: N=37. Education projects are not included.*

### Output of Bridge projects

As most Bridge projects have either recently been completed or are approaching completion, it is appropriate to assess their results primarily in terms of outputs, in line with the logic illustrated in Figure 5.1.




The overview above presents DIREC's own reporting of project outputs across three areas that are wholly or primarily related to the Bridge projects. Prototypes represent early versions of products or processes (such as protocols, software, AI-models, algorithms, etc.) and *could* constitute essential steps in the development of new solutions (as well as tools primarily relevant from a research

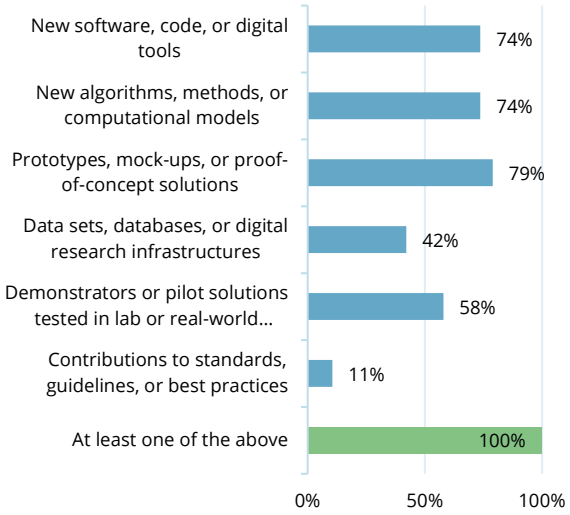
[7] External funding amounts to DKK 80 million and consists primarily of in-kind contributions in the form of staff time. There have been relatively flexible frameworks for how contributed time can be accounted for, including time spent on companies' own development projects in areas where there has been synergy with the Bridge project, as well as time spent on data generated prior to the project but used as input in Bridge-projects.

perspective). As shown below, the projects have resulted in a substantial number of prototypes and have also generated visibility through articles in both media outlets and professional journals.

Project outputs have also been examined through the survey conducted among project managers. In the survey, respondents were asked about a broader range of possible outputs. The responses cover both SciTech and Bridge projects, and no distinction has been made in the survey between outputs primarily driven by researchers, companies, or joint efforts.

Nevertheless, the results indicate that the projects have generated a wide variety of outputs, including new tools, algorithms, models, demonstrators, and prototypes (the term prototypes is more narrow defined in the survey, since the total count of 70 prototypes covers all categories in the figure).

**Figure 5.2. Share of DIREC-project managers reporting outputs in various areas**




*Source: Survey of researchers participating in DIREC activities*
*Note: N=19. The figure contains answers from BRIDGE- and SciTech project managers.*

The results presented in the figure do not indicate the extent to which algorithms, prototypes, demonstrators etc. developed in the projects have commercial potential. However, they do suggest that the projects generate more than theoretical advances and academic publications alone.

The projects span a wide range of digital research areas, sectors and application domains. This diversity mirrors the broad set of research themes prioritised by DIREC, as described in Chapter 3. The box below illustrates this variation through five contrasting examples of Bridge projects.

**Box 5.1. Examples of Bridge-projects**

**Multimodal Data Processing of Earth Observation Data**
The project focused on developing a concrete analytical solution for assessing soil and environmental conditions by combining satellite imagery with spatial and geodata. The research resulted in a demonstration model capable of integrating heterogeneous data sources to support analysis of ground conditions. The project illustrates how advanced data processing and machine-learning methods can be applied to environmental monitoring and planning contexts.

**Explain Me**
This Bridge project focused on explainable AI for clinical decision support, aiming to develop AI-based solutions that can function as a sparring partner for clinicians such as doctors and midwives. The research addressed how complex machine-learning models can be made interpretable and trustworthy in clinical settings, where transparency, accountability and human oversight are essential. The project illustrates how digital research can contribute to healthcare-related societal challenges.

**Secure Internet of Things**
This project addressed fundamental cybersecurity challenges in Internet of Things (IoT) systems, focusing on methods for analysing vulnerabilities and improving security in connected and distributed environments. The research targeted issues of robustness, trust and resilience in digital infrastructures, with relevance for safety-critical and societally important systems.

**Mobility Analytics Using Sparse Mobility Data and Open Spatial Data**
The project developed advanced data-driven

methods for analysing traffic patterns, road infrastructure and $CO_2$ emissions based on sparse and heterogeneous mobility data. Combining computer vision, spatial analysis and machine learning, the research contributes tools and models that can support evidence-based decision-making related to transport planning and sustainability.

**Edge-based AI Systems for Predictive Maintenance**
This project explored AI-based methods for predictive maintenance, with a focus on edge computing and data-driven monitoring of complex systems. The research addressed challenges related to reliability, efficiency and real-time analysis, contributing methodological advances with relevance for industrial and infrastructure-oriented applications.

## 5.2 Impact and value creation in participating companies

Interviews with company representatives involved in Bridge projects, supplemented by interviews with ecosystem actors, provide a nuanced and ambivalent picture of the impact and value creation for participating companies in Bridge projects.

Overall, the interviews suggest that DIREC has generated value primarily through insights in technical new principles, access to research-based competencies and long-term capability building, while more direct and immediate commercial impacts are less consistently observed.

### Learning and capability building as the primary source of company value

From the perspective of participating companies, some interviewees emphasise that an important source of value has been knowledge exchange and learning through interaction with other companies involved in the projects**.** In particular, some companies highlight the opportunity to discuss shared technological challenges, compare approaches and gain insight into how other firms work with similar problems. This peer-to-peer learning is, in some cases, perceived as more tangible than the direct project-specific outputs.

At the same time, the interviews indicate that a number of Bridge project activities are largely defined and driven by researchers**,** with companies typically playing a more limited and supportive role. Company representatives frequently describe their contribution as providing data, domain knowledge or access to use cases, as well as testing or validating research results produced within the projects.

In several cases, the projects are explicitly characterised as research-led, with outputs primarily feeding into PhD dissertations and academic publications (and prototypes at a low TRL-level) rather than company-driven innovation processes. While this is often accepted by companies as a legitimate and expected outcome, it also shapes the type of value created, which is predominantly indirect and long-term.

However, the Bridge portfolio also contains a few projects that are more directly driven by company-defined challenges. In these cases, companies play an active role in shaping research priorities rather than solely contributing data or test cases.

One example is the *Embedded AI* project, where company partners articulated concrete technological challenges related to deploying AI in embedded systems and were closely involved in defining the PhD subprojects.

Another example is the project *Edge-based Systems for Predictive Maintenance*, where Universal Robots and the University of Southern Denmark collaborated closely on developing AI-based approaches to predictive maintenance for collaborative robots. In this case, the company played an active role in shaping the research questions and ensuring that the project addressed concrete technological challenges relevant to its product development (see case at the end of chapter).

These projects are, however, in the minority and are characterised by a high level of company

engagement and the involvement of departments with substantial experience in industry collaboration.

The general findings raise a question in relation to DIREC's stated twofold aim for the Bridge projects. While most projects demonstrate strong scientific ambition, the focus on concrete innovation needs and applicability appears to be more uneven. In several projects, companies report that the distance between research activities and operational or product-oriented contexts remains substantial, and that applicability is often framed as a potential future outcome rather than an integral part of project design and execution.

The interviews also reveal considerable variation in the involvement of companies. In some projects, companies describe relatively close interaction with researchers and PhD students, leading to clearer mutual understanding and more relevant experimentation. In others, company involvement is more peripheral, with limited influence on research direction and modest integration of business perspectives beyond initial problem framing. Moreover, some companies note that cross-sub-project knowledge sharing is limited, with collaboration largely confined to bilateral interactions (typically with PhD-students) rather than broader joint learning across the project consortium.

### Variation in company roles and alignment with innovation needs

Ecosystem actors largely corroborate this picture. Several stakeholders emphasise that Bridge projects should be understood as operating at relatively low TRL levels, where the main objective is to translate research into early concepts, methods or demonstrators rather than market-ready solutions. From this perspective, the value of the projects lies in enabling experimentation, technical clarification and learning at the interface between research and application.

These stakeholders see Bridge projects as an intermediate instrument that helps reduce technological uncertainty and clarify application potential, thereby informing later development efforts in other funding schemes or organisational settings. This also helps explain why only a limited number of companies move forward with larger innovation activities, even though such examples do exist.

Taken together, the interviews suggest that DIREC has created value for participating companies mainly through learning, access to cutting-edge research and interaction with both researchers and other companies. However, the findings also indicate a tension between the stated ambition of the Bridge projects and their practical implementation. While scientific quality and research output are generally strong, the extent to which projects systematically connect digital research with clearly defined innovation needs and applicability varies considerably across projects.

Finally, interviews with researchers and companies suggest that follow-up activities are not yet widespread. In most projects, the primary focus appears to be on completing PhD dissertations and sharing the final research results with participating companies, with more limited attention to structuring subsequent development or collaboration pathways.

### Why innovation outcomes in computer science may differ from traditional domains

Interviews highlight several characteristics of computer science that shape expectations for innovation outcomes. Unlike traditional technology domains, innovation in computer science often takes the form of algorithms, software and computational models rather than tangible products. This makes value creation less visible and more difficult to link to short-term commercial outcomes.

Such outputs are typically modular and function as components within larger systems, meaning that their practical value depends on subsequent integration and complementary development. As a result, the pathway from research to application is often indirect and uncertain, particularly in early-stage research.

Several interviewees therefore caution against applying innovation metrics and expectations derived from product-oriented fields. A strong emphasis on immediate, demonstrable outputs may misrepresent the nature of digital research processes.

### The role of the centre design

The interviews indicate that the design of DIREC plays a significant role in shaping both company expectations and the types of innovation outcomes observed in the Bridge projects. Company representatives consistently describe their involvement as requiring a conscious prioritisation of time and resources, as companies do not receive direct financial support under the Bridge scheme but instead co-finance projects primarily through in-kind contributions in the form of staff time (as opposed to innovation grants under Innovation Fund Denmark).

Several interviewees note that this funding model influences how companies engage with the projects, often leading to selective and time-limited participation focused on specific PhD projects, testing activities or dialogue around defined technical questions.

Company interviews further suggest that expectations regarding innovation outcomes are closely linked to this time commitment. While most companies enter the projects with an interest in long-term learning and access to research-based knowledge, several interviewees emphasise that limited internal resources constrain their ability to engage deeply in exploratory research activities. As a result, some companies accept that innovation outcomes are indirect and long-term, rather than immediate inputs to product development or commercialisation.

The interviews also point to the importance of how projects are initiated. A number of Bridge projects were predefined at the outset of the centre and primarily based on research-driven ideas developed by academic partners. In these cases, companies are often invited into projects that are already conceptually framed, which can limit the extent to which company-defined challenges shape research agendas.

In later calls, there appears to have been greater scope for aligning project design with concrete industrial problem formulations, which some interviewees perceive as improving relevance and engagement. This development is further reflected in the design of the Next Generation projects, which are more explicitly oriented towards addressing challenges defined by companies and are therefore expected to strengthen the link between research activities and innovation needs.

The interviews provide mixed evidence regarding follow-up collaboration and funding. While there are examples where Bridge projects have led to continued dialogue and, in some cases, to follow-up applications to programmes such as those under Innovation Fund Denmark, these cases remain relatively limited. Overall, the findings suggest that only a modest share of projects translate into more formalised follow-up activities or larger development initiatives.

Furthermore, many companies describe the project outcomes – such as prototypes – as being at a very early and immature stage. This limits both the interest in and the feasibility of engaging in follow-up collaboration in concrete innovation projects. At the same time, companies' strategic priorities may shift over time, and interest can diminish if further development requires a substantial commitment of resources and staff time.

Only in a limited number of cases do the projects appear to include activities that could strengthen applicability from a company perspective, such as company-based experiments or extended placements within participating firms.

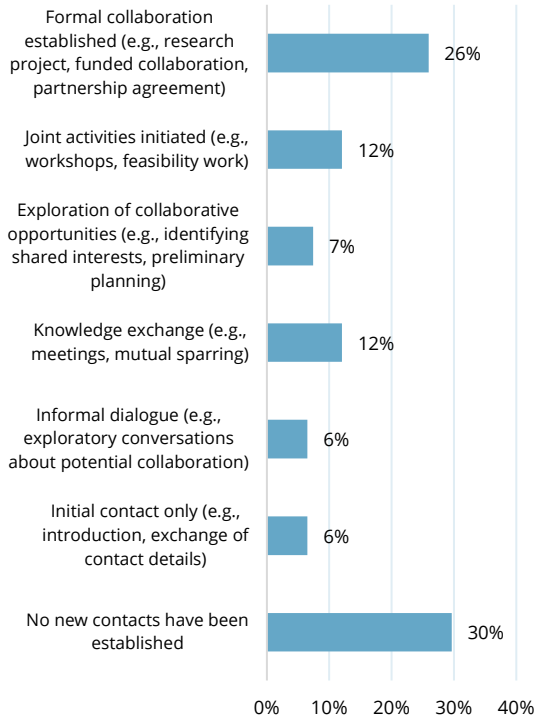
An exception is the collaboration between the University of Southern Denmark and Universal Robots, where the project was centred on an industrial PhD arrangement in which the affiliated researcher spent a substantial share of the project period in the company (see case below).

### New relations

As illustrated in Figure 5.1 at the beginning of the chapter, another indicator of outcomes is the extent to which DIREC activities contribute to the establishment of new relationships that may, over time, develop into further collaboration.

In the survey conducted among researchers, respondents were asked whether their participation in DIREC had led to the establishment of relationships with companies or public-sector actors with whom they had not previously collaborated. Figure 5.3 shows the *highest level of engagement* reached with such new contacts.

**Figure 5.3. New relationships between researchers and external actors developed through DIREC**




*Source: Survey of researchers participating in DIREC activities*
*Note: N=108. The researchers were asked to state the highest level of engagement reached due to DIREC-participation.*

As shown, for seven out of ten researchers who responded to the survey, DIREC has led to new contacts with either companies or public-sector actors. For approximately one quarter of the respondents, these relationships have developed into formal collaboration projects (e.g. Bridge projects).

Interviews with researchers, project managers and company representatives indicate that DIREC has played a meaningful role in facilitating new relationships between researchers and companies, including collaborations that did not exist prior to the projects.

From the researchers' perspective, DIREC is frequently described as a platform that lowers barriers to engaging with companies. Project managers note that the centre structure makes it easier to approach companies around exploratory or research-oriented topics. In particular, researchers highlight that the Bridge format has enabled contact with companies outside their established networks, thereby broadening the range of industrial perspectives informing their research.

Company interviewees similarly report that DIREC has provided access to research environments and competencies they would not normally interact with. For several companies, participation in Bridge projects has been their first direct collaboration with academic computer science research, and the projects are described as an opportunity to explore collaboration without committing to clearly defined product development or short-term commercial outcomes.

## Key takeaways

**Broad company engagement across projects**

- A total of 74 external actors have participated in DIREC projects, including 65 private companies, as well as public organisations and research and technology institutes.
- Participating firms represent both large enterprises and SMEs across diverse sectors.
- 7 out of 10 researchers have established new relationships with external actors.

**Innovation effects primarily linked to learning and exploration**

- DIREC has contributed to innovation mainly through knowledge exchange, capability building, and early-stage exploration.
- Companies highlight access to research-based knowledge and peer-to-peer learning as key sources of value.
- Direct and immediate commercial impacts remain limited at this stage.

**Research-driven project origination**

- Most projects originate from research questions or joint dialogue between researchers and companies. Only a limited number are primarily based on company-defined challenges.
- Industry involvement varies in depth, from data provision and validation in most cases to closer problem-driven collaboration in selected cases.
- Many companies perceive project outputs as being at an early and immature stage, pointing to a gap between the type of research-driven activities typically undertaken in the projects and the level of development required to create solutions that are applicable and valuable in a business context.

# CASE:
# Edge-based Systems for Predictive Maintenance

| | |
|---|---|
| **Project period** | 2022-26 |
| **Budget** | DKK 12.2 million |
| **Participants** | University of Southern Denmark, IT-University, Alexandra Institute and four companies |
| **Lead** | University of Southern Denmark |

## Predictive Maintenance for Collaborative Robots

Industrial robots are increasingly used in production environments where reliability and uptime are critical. The DIREC Bridge project *"Predictive Maintenance for Collaborative Robots Based on Artificial Intelligence and Edge Computing"* explored how data-driven methods can be used to monitor robot performance and anticipate failures before they occur.

The project brought together researchers from several universities, including the University of Southern Denmark (SDU), with industrial partners such as Universal Robots. The research focused on analysing operational data from robots and developing predictive models capable of identifying early signs of malfunction or component wear.

## Active company steering shaped the research direction

For Universal Robots, the project addressed a concrete technological challenge: how to use operational data from collaborative robots to better understand their condition and support predictive maintenance. Early in the project, the partners discovered that the initially envisioned AI approaches were difficult to apply in practice given the available data and system constraints. As a result, the research direction was adjusted during the project towards statistical machine learning and a stronger focus on understanding robot behaviour under real operating conditions.

According to the company, this ability to adapt the research direction was enabled by a deliberately structured collaboration model. Universal Robots ensured early involvement of relevant technical leaders, organised quarterly synchronisation meetings with the SDU research team, and maintained continuous internal alignment on the project's objectives. In addition, project goals were linked to internal performance targets, which helped maintain focus on concrete technological outcomes. Together, these mechanisms helped ensure that the project remained closely connected to innovation rather than evolving into a purely academic research effort.

The project contributed both technological and organisational learning within Universal Robots. It generated new insights into robot health and component behaviour and supported the development of diagnostic tools and architectural elements relevant for predictive maintenance solutions. At the same time, the industrial PhD embedded in the project built several years of domain-specific expertise, which is now retained within the company and contributes to ongoing development in one of its strategically important AI teams.

# 6. DIREC'S CONTRIBUTION TO CAPACITY BUILDING IN THE DIGITAL DOMAIN

A core objective of establishing DIREC has been to address the significant shortage of digital competencies in Denmark, both within academia and in society at large. As outlined in the original project plan, the ambition was not only to strengthen research excellence in digital technologies, but also to build sustainable capacity through the recruitment of researchers, the education of PhD students and graduates, and increased enrolment in IT-related study programmes. Capacity building was thus positioned as a fundamental means of securing Denmark's long-term position as a digital frontrunner.

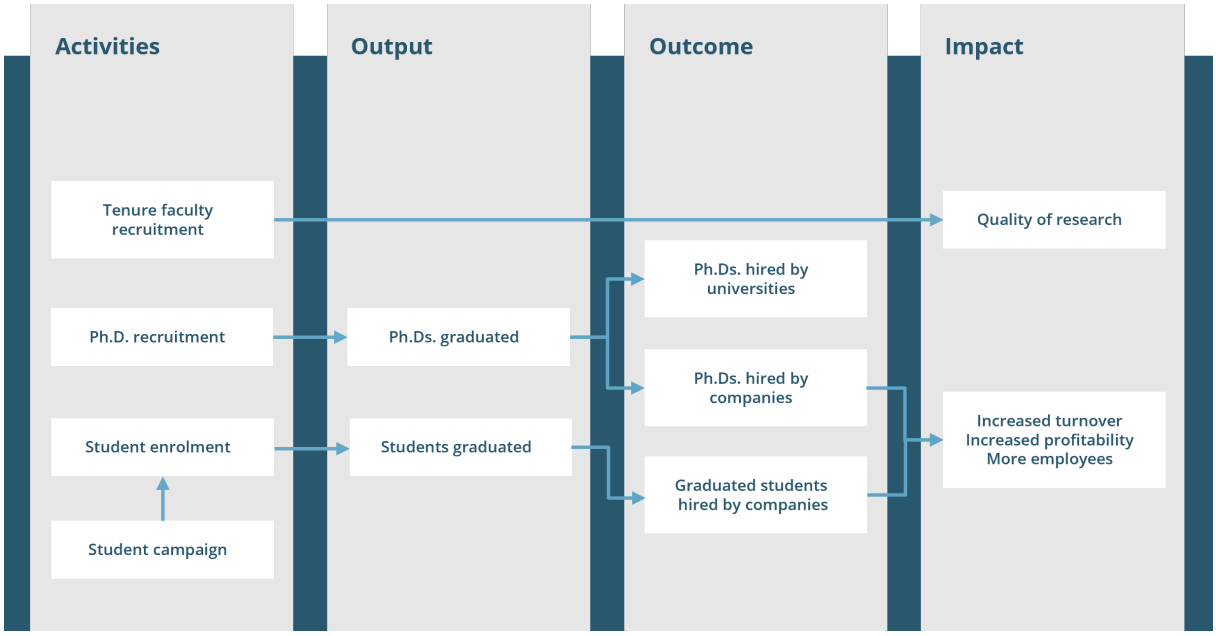
In practice, DIREC has pursued capacity building through a combination of activities, including:

- Recruitment of new researchers (not least tenure-track positions).
- Funding of PhD and postdoctoral positions.
- Educational projects focusing on strengthening education in digital technologies.
- Efforts aimed at increasing enrolment in IT programmes and improving diversity among students.

The underlying ambition has not merely been to increase headcount, but to strengthen the coherence between research, education, and labour market needs.

Figure 6.1 outlines how activities such as recruitment and student enrolment are expected to generate measurable outputs (graduates and PhDs), translate into outcomes in the form of employment in universities and companies, and ultimately contribute to long-term impacts such as improved research quality and increased value creation in industry.

**Figure 6.1. DIREC's contribution to capacity building in the digital domain**




*Source: Based on DIREC (2023) "Midterm Evaluation of Digital Research Centre Denmark".*

While Figure 6.1 outlines a clear logic from activities to outputs, outcomes and long-term impacts, it should be noted that capacity building in education and research is characterised by long time lags. The education of graduates and PhD students, their subsequent labour market integration, and eventual effects on research quality and value creation unfold over several years. Consequently, this chapter primarily assesses DIREC's contribution at the level of activities and early outputs, while qualitative interviews are used to indicate the plausibility and direction of expected outcomes and impacts rather than to document them conclusively.

Five capacity-related KPIs have been defined for DIREC. Table 6.1 provides an overview of these KPIs and their target achievement.

**Table 6.1. DIREC KPI's for capacity building**

| KPI | Status at the end of 2025 |
|---|---|
| *47 Tenure recruitment* | *44** |
| *43 young research recruitment* | *45** |
| *1 student recruitment campaign* | *1* |
| *1,150 additional students enrolled* | *462* |
| *25% increase in number of female students* | *56%* |

*Source: IRIS Group based on data from DIREC*
*Note: At the time of publication, the final reporting from the universities for 2025 had not yet been completed. Consequently, the figures presented do not fully reflect the most recent data and may therefore be slightly underestimated.*

The table indicates that DIREC has achieved all KPIs related to capacity building, except for the target concerning student enrolment. However, it is important to bear in mind that the KPIs for capacity building differ somewhat from DIREC's other impact areas. While DIREC's activities can be designed to achieve, for example, more publications and increased industry collaboration, the capacity building KPIs are more sensitive to external factors such as political reforms. The following two sections discuss this in further detail.

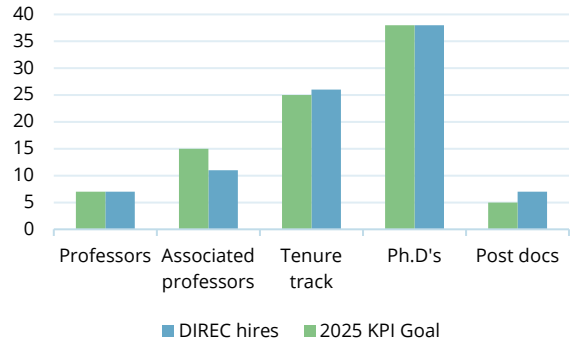
## 6.1 Recruitment of researchers

Recruitment of researchers has been a central element of DIREC's capacity-building efforts and relates directly to the first two capacity KPIs on tenure recruitment and young researcher recruitment.

As illustrated in Figure 6.2, DIREC has contributed to the recruitment of professors, associate professors, tenure-track researchers, PhD students and postdoctoral researchers across all Danish universities, reflecting the national scope of the centre.

The recruitment of tenure-track and permanent academic staff primarily reflects the universities' co-financing commitments under DIREC, where participation in the centre has supported and accelerated local hiring decisions.

**Figure 6.2. DIREC hires**




*Source: IRIS Group based on data from DIREC*

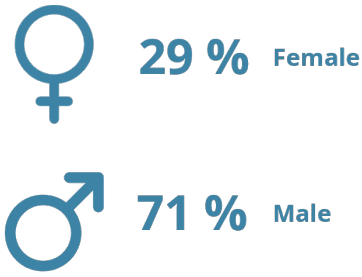
Interviews with university leadership and senior researchers indicate that DIREC has often functioned as a catalyst rather than a sole funding source, providing strategic legitimacy, reducing institutional risk and strengthening the internal case for prioritising digital research capacity. In contrast, the recruitment of young researchers, in particular PhD students and postdoctoral researchers, has been mainly financed through DIREC project funding, directly linked to the centre's research activities and collaborative projects.

The qualitative interviews further suggest that the recruitment effects have been particularly pronounced for young and internationally recruited researchers. Several interviewees emphasise that DIREC has increased the attractiveness of Danish digital research environments by offering access to cross-institutional projects and a critical mass of expertise. For international researchers, the broader DIREC ecosystem - including networks, shared activities and national visibility - has created professional and social value that contributes not only to recruitment but also to retention. These ecosystem-related effects are discussed in more detail in Chapter 8.

At the same time, the interviews point to an uneven recruitment effect across research areas, with the strongest growth observed in core computer science and technical digital domains, while some cross-disciplinary and educational research areas have experienced more limited volume effects. This suggests that while DIREC has contributed significantly to overall capacity growth, the distribution of recruitment reflects both strategic priorities and structural conditions in the research system.

In terms of gender balance, 29% of recruited researchers are women and 71% are men. Interviewees generally assess this distribution as broadly in line with the gender composition of computer science and digital research more generally, both nationally and internationally. While the figures indicate continued structural imbalance, they are not perceived as a DIREC-specific issue, but rather as a reflection of the broader recruitment pool within the field.

**Figure 6.3. Gender balance in DIREC hires**




*Source: IRIS Group based on data from DIREC*

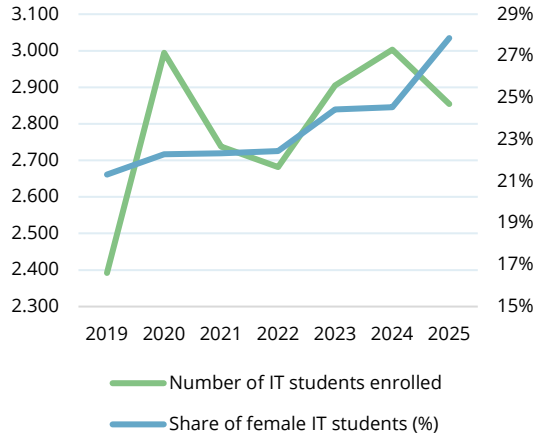
While it is too early to assess long-term outcomes in terms of permanent employment structures and research performance, the interviews suggest early outcome signals, including strengthened career pipelines for young researchers and improved retention of internationally recruited staff, partly driven by the broader DIREC ecosystem.

## 6.2 Student enrolment and education

Education and student enrolment constitute a central pillar of DIREC's capacity-building ambitions and relate to the three remaining capacity KPIs concerning student recruitment, increased enrolment, and gender balance in IT education.

As illustrated in Figure 6.4, the total number of students enrolled in IT-related programmes has increased over the period, although the specific KPI target of 1,150 additional students enrolled in 2025 compared to 2019 has not been fully achieved. Student enrolment peaked in 2020 and again in 2024, followed by a slight decline in 2025.

**Figure 6.4. Number of IT students enrolled and share of female students**




*Source: IRIS Group based on data from DIREC*

The enrolment data cover IT-related study places across Danish universities and include engineering programmes, computer science programmes, and humanistic and social science-oriented computer science disciplines. Over the period, new IT programmes have been established while others have been discontinued. Efforts have been made to include newly established programmes in the dataset; however, minor uncertainties may remain if individual programmes have been overlooked. Consequently, the figures should be interpreted as robust trends rather than exact counts.

As part of its capacity-building activities, DIREC has participated in one student recruitment campaign, TechReal - a national outreach initiative aimed at increasing awareness of technology and digital career paths among young people. TechReal focuses on showcasing real-world applications of technology and concrete job opportunities in collaboration with universities, companies and other ecosystem actors, with the objective of strengthening interest in STEM and IT-related education.

The qualitative interviews, however, suggest that the direct impact of the student campaign on enrolment decisions is difficult to isolate.

Qualitative interviews with university representatives suggest that the observed fluctuations in student enrolment reflect broader structural dynamics beyond DIREC's direct control. Several interviewees point to the extraordinary peak in 2020 as partly driven by external factors, including changing student preferences during the COVID-19 period, while the renewed peak in 2024 is associated with the continued societal and labour market focus on digitalisation and AI. Interviewees also emphasise that the national higher education reform has had tangible consequences for enrolment patterns, both through changes in programme structures and through increased uncertainty regarding future intake and capacity planning at universities.

In this context, DIREC is primarily described as a supporting and enabling factor, contributing to increased educational capacity through strengthened research environments and staffing, rather than as the sole driver of student demand. In contrast to the overall enrolment target, the KPI concerning female participation in IT education has been more than fulfilled. Across all types of IT-related programmes, the number of female students has increased by 56%, significantly exceeding the target of a 25% increase. The positive trend is consistent across programme types, although at different levels: women constitute 17.7% of enrolled engineering students (+8 percentage points since 2019), 24.3% of science students (+6.7 percentage points), and 48.3% of students in social science and humanities-oriented IT programmes (+6.2 percentage points).

Interviews indicate that this development is widely perceived as a substantial and encouraging shift in a field traditionally characterised by persistent gender imbalances. As shown in Figure 6.4, a similar positive trend is observed in the share of female students among newly admitted cohorts, suggesting that the improvement is structurally anchored rather than driven by short-term effects.

### Educational projects and research on IT education

In addition to its indirect effects on student enrolment, DIREC has directly supported capacity building through a limited set of educational projects and research activities focused on IT education. These projects have addressed challenges related to teaching quality, scalability, diversity, and pedagogical development within computer science education.

Insights from interviews with participants directly involved in these educational activities indicate that DIREC has provided a rare national platform for systematic experimentation and research-based development of IT education, enabling experiences and results to be shared across institutions. In particular, interviewees highlight that such activities are seldom prioritised in traditional research funding schemes, despite their importance for long-term educational capacity building.

While educational projects constitute a relatively small share of DIREC's overall budget and are less prominently discussed across the broader interview material, they are described by involved stakeholders as strategically important. In particular, the projects are seen as contributing to a stronger evidence base for IT education and as supporting sustained growth in student numbers and diversity within the digital domain.

## Key takeaways

**Significant growth in research capacity**

- 89 new digital researchers (faculty and junior researchers) have been recruited.
- Recruitment spans all eight Danish universities, supporting a national strengthening of core computer science environments.
- The share of women among newly hired researchers (29%) indicates progress, although gender imbalance remains a structural challenge.
- DIREC has functioned as a catalyst, strengthening the strategic case for hiring and enhancing the attractiveness of Danish research environments, particularly for early-career and international researchers.

**Increased student intake – but long-term gap persists**

- 462 additional students have enrolled in IT programmes. The target of 1,150 additional students was affected by structural and political factors beyond DIREC's direct control.
- The goal of a 25% increase in the number of female students has been substantially exceeded, with a reported increase of 56%. The positive trend is observed across programme types and appears to be structurally anchored.

**Educational initiatives: limited scale, strategic importance**

- Although educational projects represent a relatively small share of the overall budget, they are described as strategically important for strengthening experimentation, knowledge sharing, and long-term capacity in IT education.

# CASE:
## Secure Internet of Things

| | |
|---|---|
| **Project period** | 2022-26 |
| **Budget** | DKK 25.1 million |
| **Participants** | Five universities; eight companies; one RTO |
| **Lead** | Aarhus University, Department of Computer Science |

**The Bridge project "Secure Internet of Things" (SIoT)** addressed the growing challenge of cybersecurity in connected products and systems. As digitalisation and connectivity increasingly become integral to industrial products and services, companies face rising exposure to cyber risks that are difficult to identify, assess and manage systematically. The overall purpose of SIoT was to strengthen the scientific foundation for analysing security and security risks in Internet of Things (IoT) systems, while at the same time supporting companies in gaining a better understanding of these risks and how they can be addressed.

The project brought together five universities, eight companies and the Alexandra Institute, combining academic expertise in computer science and cybersecurity with industrial experience from companies developing and operating connected systems. SIoT was organised into three subprojects, each focusing on different aspects of security in IoT systems.

### Research objectives and results

From the academic perspective, SIoT was largely concerned with developing methods and analysis tools to assess security and security risks in complex IoT systems. This required close interaction with companies, which contributed models of real-world systems, including system architectures and attack models. These models formed the basis for developing analytical approaches capable of identifying vulnerabilities and assessing risk across interconnected systems.

According to the project leadership, SIoT resulted in substantial academic progress. Across the project, four PhD theses were completed, alongside a significant number of scientific publications. Together, these outputs constitute a substantial body of research on modelling, security analysis and risk assessment for IoT systems, strengthening the research base within cybersecurity and IoT in Denmark.

### Value creation for companies – selected examples

From the company perspective, SIoT created value through a combination of technical contributions and strategic benefits related to understanding and managing cybersecurity risks.

For *Beumer Group*, participation in one of the subprojects resulted in concrete technical and methodological benefits linked to the company's baggage handling systems in airports. Through collaboration with researchers, Beumer Group gained insights into how cybersecurity risks in complex, distributed systems can be analysed using models of system architecture and potential attack scenarios. The project supported more systematic consideration of vulnerabilities and their potential impact on availability and reliability, and contributed to integrating cybersecurity earlier in the design and development of airport logistics solutions.

For *Grundfos*, the value of SIoT was primarily related to strategic learning, network building and improved understanding of cybersecurity risks and their management. While the company's direct involvement in research activities was limited, participation exposed Grundfos to research-based concepts and emerging technical approaches. SIoT also functioned as a knowledge-sharing forum and enabled the establishment of important contact points with Danish universities. Overall, the project strengthened Grundfos' ability to discuss and manage cybersecurity risks at a strategic level in an increasingly connected product landscape.

# 7. DIREC'S CONTRIBUTION TO DIGITAL ENTREPRENEURSHIP

## 7.1 Activities and participants

An important mechanism for translating digital research into value is the creation of new companies in which research results are applied and commercialised. At the same time, the development of entrepreneurial competencies can strengthen the ability of digital research environments to generate ideas and research projects with clear societal relevance.

Against this background, DIREC has established a cross-cutting workstream on entrepreneurship with the following objectives:

- To strengthen commercialisation and entrepreneurial capabilities among actors involved in DIREC projects.
- To facilitate +25 startups during the first five years of DIREC.
- To increase the visibility of DIREC's activities and outcomes at events with a focus on entrepreneurship and innovation.

A key priority within this workstream has been to engage in collaboration with other actors in the universities' entrepreneurship ecosystems. This includes cooperation with the Open Entrepreneurship programme, which aims to boost commercialisation and increase the number of research-based startups by facilitating collaboration with experienced entrepreneurs from the private sector[8].

To realise these objectives, DIREC has developed a number of activities that both build competencies and inspire a larger share of digital researchers to engage in entrepreneurship. These activities include:

- The development of the "Young Researcher Entrepreneurship Bootcamp", which has been delivered four times.
- The organisation of entrepreneurship workshops at the annual D3A conferences and at DIREC's annual conference.
- The development of the guide "Academic Digital Entrepreneurship", targeted at researchers and research leaders.
- The organisation of a range of activities at the annual Digital Tech Summit (Denmark's largest digitalisation fair), including conference sessions and exhibition stands.

At the time of the evaluation, two spin-out companies has been established based on DIREC research projects (see case study at the end of the chapter). In addition, a few participants in the *Young Researcher Entrepreneurship Bootcamp* had either founded their own companies or initiated startup projects with this objective in mind. These entrepreneurs emphasised that the bootcamp had played an important role in advancing their startup projects.

The entrepreneurship workstream includes two activity-related KPIs, both of which have been exceeded over the project period. In total, 181 researchers have received entrepreneurship training, compared to a target of 80, and 49 networking meetings involving entrepreneurs have been organised, exceeding the target of 30.

[8] See https://open-entrepreneurship.com

**Table 7.1. KPI's for digital entrepreneurship**

| *KPI* | *Status end of 2025* |
|---|---|
| **80** researchers taught entrepreneurship | **181** |
| **30** entrepreneur network meetings | **49** |

*Source: IRIS Group based on data from DIREC*

Overall, DIREC has more than achieved its KPI's for digital entrepreneurship. However, there remains some distance to the target of contributing to the establishment of 25 new companies as envisioned in the application to IFD.

## 7.2 Young Researchers Entrepreneurship Bootcamp

The Young Researchers Entrepreneurship Bootcamp is the largest activity within DIREC's workstream on digital entrepreneurship.

The overarching objective of the bootcamp has been to strengthen the entrepreneurial mindset among PhD students and early-career researchers working within digital and data-driven research fields and to equip them with practical tools and approaches for working systematically towards the establishment of a company, while also supporting broader skills related to opportunity recognition and societal impact.

The bootcamp has been delivered four times to date, hosted at DTU and Aarhus University, respectively. So far, approximately half of the participants represent IT and computer science research, while the remainder represent other research domains in which digital technologies play a central role, contributing to an interdisciplinary learning environment.

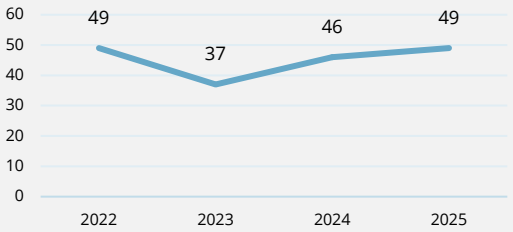
The course runs over four days and is organised around a series of modules covering key elements of early-stage entrepreneurship, including idea generation, team formation, value proposition development, market validation, trend analysis, and pitch training.

The figures on the following page show that the bootcamp has attracted a stable and relatively large group of participants, with close to 200 participants in total. Participation levels have remained consistent over time, indicating sustained demand for targeted entrepreneurship training among early-career researchers in digital research fields.

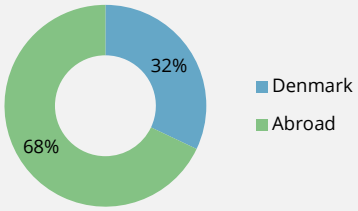
Participants represent all Danish universities, with particularly strong representation from technical and science-oriented institutions. DTU accounts for the largest share of participants across the period, and DTU's share has increased over time, reaching 61% in 2025. This development may indicate a need to strengthen outreach and marketing efforts towards other universities in future iterations of the programme.

## Profile of YREB-participants

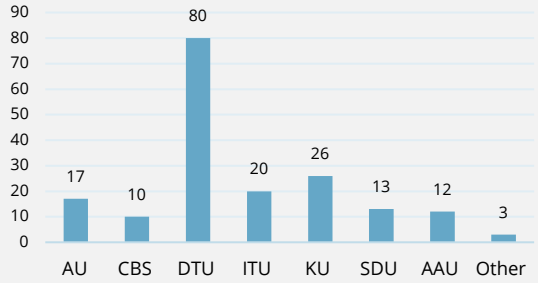
### Development in the number of participants



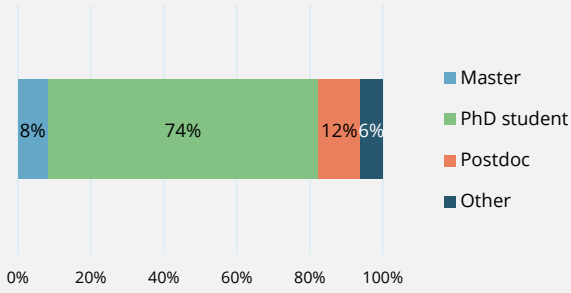

### Nationality of participants, 2022-2025



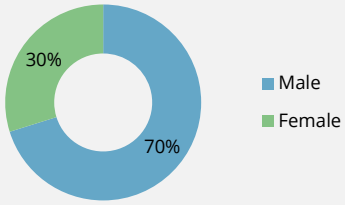

### Number of participants from each university, 2022-2025



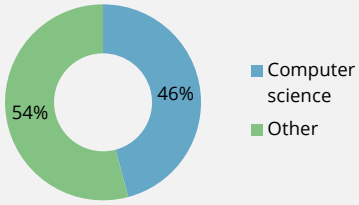

### Types of participants, 2022-2025




### Gender distribution of participants, 2022-2025




### Associated department of participants, 2022-2025




*Source: DTU (2025); "Evaluering af Young Researcher Entrepreneurship Bootcamp – hovedkonklusioner og perspektiver"*

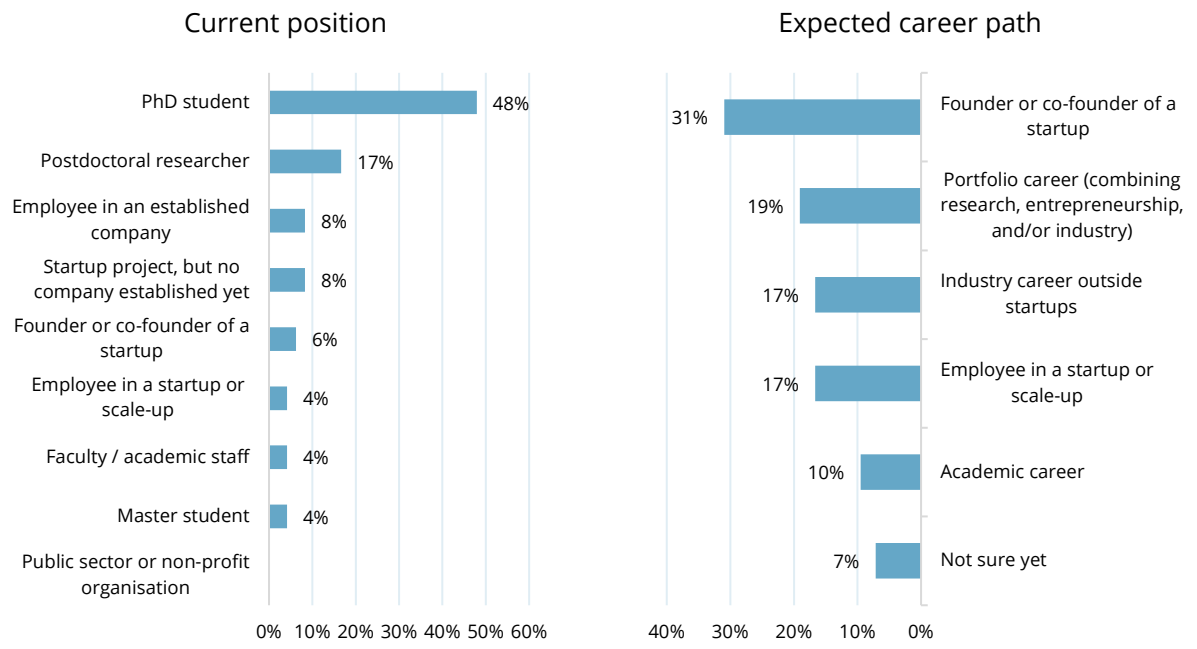
### Career paths, aspirations and perceived outcomes among YREB participants

Most participants in the YREB bootcamps remain within the research system (for example because they are still completing their PhD or postdoctoral projects). However, a substantial share has been involved in startup projects (of which some have been closed), and an even larger group view entrepreneurship as a longer-term ambition or potential career path.

Figure 7.1 illustrates both participants' current primary occupation and what they consider to be their most likely career path five years ahead. Participants aspiring to become founders of new companies constitute the largest group. In addition, a significant number expect to pursue a portfolio career, combining research with entrepreneurship or employment in industry.

Among the 42 respondents to the survey, 13 have been involved in concrete startup projects following their participation in the bootcamp. However, only 7 of these have either established a company or remain actively involved in a startup project at the time of the survey.

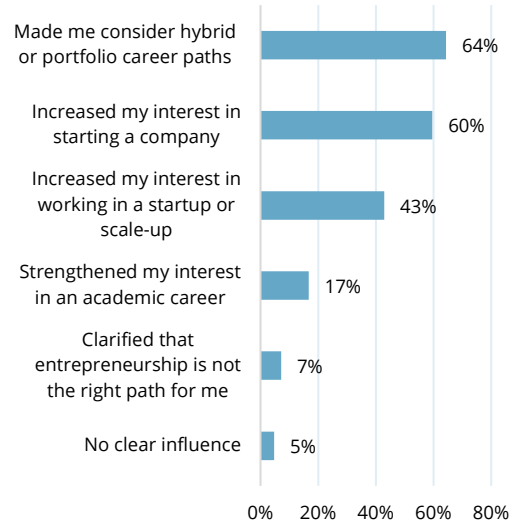
**Figure 7.1. Current position and expected career paths for YREB-participants**




*Source: Survey of participants in YREB*
*Note: n=42*

The survey results also indicate that the YREB bootcamp has had a significant impact on young researchers' reflections on career paths. This is illustrated in Figure 7.2, which provides an overview of the bootcamp's influence on participants' career considerations. The responses show that a substantial number of participants have developed a stronger interest in establishing or joining a startup. In addition, a notable share report that the course has prompted more serious consideration of a hybrid career, combining research with entrepreneurship or employment in industry.

**Figure 7.2. The YREB-bootcamps impact on participants career thinking**




*Source: Survey of participants in YREB*
*Note: N=42. Respondents could select multiple categories.*

The conducted interviews, together with YREB's own course evaluation[9], show that most participants enter the bootcamp with a high level of motivation and curiosity about entrepreneurship. From this perspective, they seek to complement their deep technical skills with knowledge and competencies related to starting and developing companies.

Participants report that the course leaves them better equipped to engage in entrepreneurial activities, further strengthening their interest in digital entrepreneurship. The interviewed participants generally perceive the bootcamp as a well-functioning, general entrepreneurship course, through which they become familiar with a range of relevant tools, gain deeper insight into the startup ecosystem, and develop a clearer understanding of what it takes to succeed as an entrepreneur.

The following elements are highlighted as key learning outcomes and sources of perceived value:

*Understanding of the startup ecosystem:*

- Clearer overview of relevant actors and support structures (e.g. DTU Skylab, Lighthouse, university-based incubators).
- Better knowledge of where and how to seek funding, support, and advice at different stages.

*Entrepreneurial mindset and team dynamics:*

- Strong emphasis on the importance of building the *right team* as a prerequisite for success.
- Insight into how successful startups often pivot and evolve, driven by team strength rather than the original idea alone.

*Concrete entrepreneurial tools and concepts:*

- Exposure to tools such as business model thinking, value propositions, pitching, and customer segmentation.
- Improved understanding of funding mechanisms, equity, vesting, and early-stage investment logic.

*IP and legal considerations:*

- Valuable input on intellectual property, especially for research-based and software-driven startups.
- Appreciation of nuanced discussions on how IP protection differs across technologies and sectors.

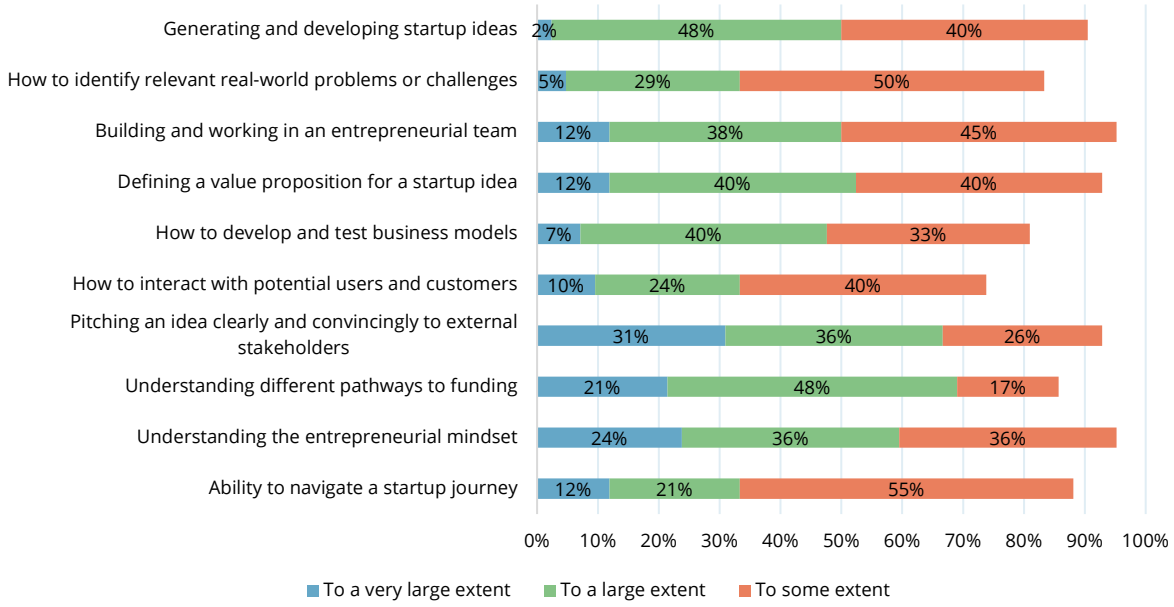
*Communication and pitching skills:*

- Final pitch session seen as highly relevant and transferable to both academic and non-academic contexts.
- Participants valued learning to clearly and concisely communicate ideas to non-academic audiences.

The survey results further indicate that a large majority of participants experience strengthened competencies across a range of areas as a result of the course. As illustrated in Figure 7.3, the bootcamp has been particularly effective in enhancing participants' understanding of the entrepreneurial mindset and of pathways to securing funding for new ventures. In addition, the concluding pitch session generates substantial learning related to presenting startup ideas to external stakeholders, such as investors.

[9] DTU (2025): "Evaluering af Young Researcher Entrepreneurship Bootcamp 2025"

**Figure 7.3. The degree to which YREB strengthens participants competencies**



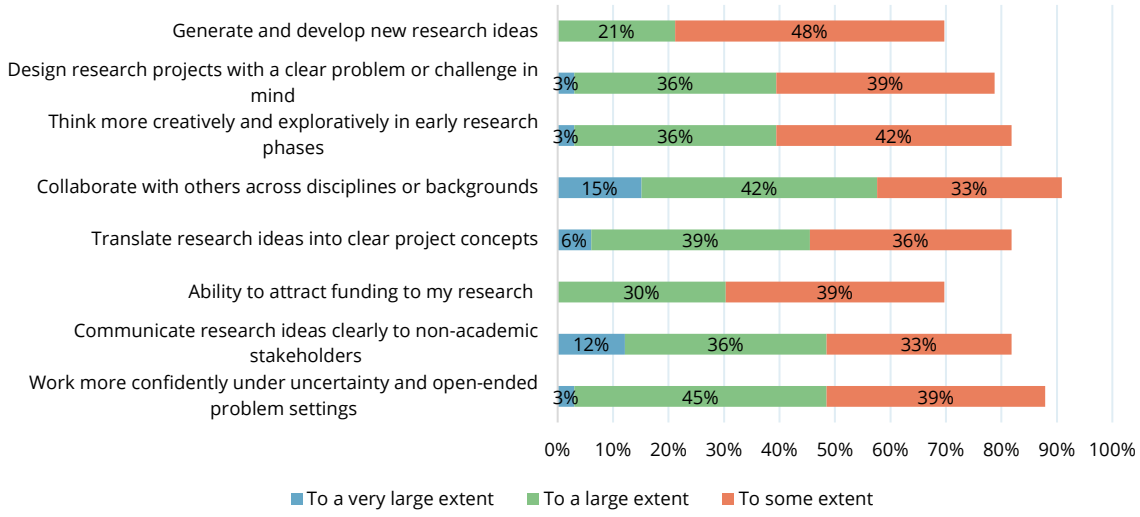

*Source: Survey of participants in YREB*
*Note: n=42*

### Relevance of YREB learning outcomes for academic research careers

The learning outcomes from the Young Researcher Entrepreneurship Bootcamp are also relevant in a research context.

As illustrated in Figure 7.4, participants report that the course has strengthened their ability to collaborate across disciplines and to communicate research ideas clearly to non-academic stakeholders. The responses also indicate that, for a substantial share of participants, the bootcamp has enhanced their ability to develop new research ideas and to secure funding for them.

**Figure 7.4. The degree to which YREB strengthens participants research abilities**




*Source: Survey of participants in YREB*
*Note: n=33*

A plausible explanation for these effects is that the bootcamp exposes participants to structured ways of developing and clarifying early-stage ideas, combined with repeated opportunities to articulate these ideas to others and receive feedback. The format encourages participants to move back and forth between problem definition and solution thinking, which can sharpen the framing of research questions and help translate promising ideas into more coherent project concepts. Moreover, the collaborative course design – working intensively with peers from different disciplines and backgrounds – appears to provide a practical arena for experimenting with new perspectives and approaches, thereby supporting creative and explorative thinking.

Finally, the emphasis on communicating ideas to non-academic audiences and discussing how projects can gain traction externally can help participants become more attentive to clarity, relevance, and feasibility.

## 7.3 DIREC-based startups

DIREC's contribution to research-based digital entrepreneurship can only be assessed over a longer time horizon. To date, the activities have primarily contributed to strengthening interest in entrepreneurship among early-career researchers and to building competencies in entrepreneurship, which may in the longer term lead to the establishment of more digital start-ups and scale-ups.

At present, two early-stage spin-outs have been established based on research conducted within Bridge projects. The case on *Prenaital* (last page of this chapter) illustrates how DIREC's cross-institutional and interdisciplinary approach has provided a foundation for innovative applications of AI within obstetrics.

### Key takeaways

**Early-stage entrepreneurship support through YREB**

- 181 early-career researchers have been engaged in The Young Researcher Entrepreneurship Bootcamp (YREB).
- The bootcamp provides structured exposure to startup ecosystems, business model development, IP considerations, funding mechanisms, and pitching skills.

**Measurable influence on career reflections**

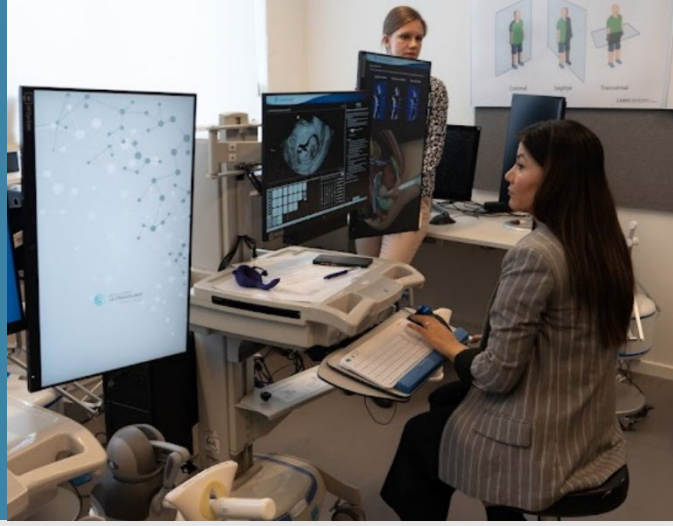
- Survey results show that the bootcamp has significantly influenced participants' career thinking.
- A substantial share report more interest in starting a company or working in a startup or scale-up.
- Many YREB participants indicate interest in hybrid or portfolio careers, combining research with entrepreneurship or industry engagement.

**Concrete, but still limited, startup outcomes**

- 2 early-stage spin-outs have been established based on DIREC supported research projects
- Several YREB participants have engaged in startup projects following the bootcamp. A smaller group has established companies or remains actively involved in startup development.
- Most YREB participants remain within academia at present, often due to ongoing PhD or postdoctoral positions, suggesting that entrepreneurial effects may materialise over a longer time horizon.

# CASE:
## Explain Me and Prenaital

| | |
|---|---|
| **Project period** | 2022-26 |
| **Budget** | DKK 28.0 million |
| **Participants** | Four universities; two university hospitals |
| **Lead** | DTU, Department of Applied Mathematics and Computer Science |



Healthcare systems face increasing complexity in medical decision-making, and diagnostic errors remain a significant challenge. It is estimated that approximately one in ten medical diagnoses is incorrect, which can result in patients not receiving appropriate treatment. Such errors are often linked to time pressure, complexity and differences in experience and training among medical staff. At the same time, advances in artificial intelligence offer new opportunities to support clinical decision-making – provided that AI systems can be understood, trusted and meaningfully integrated into clinical practice.

The Bridge project *Explain Me* was initiated in response to this challenge. Rather than developing AI systems that provide unclear recommendations, the project focused on how explainable AI can support clinicians by acting as a digital mentor. The ambition was to develop AI-based decision-support tools that offer feedback, explanations and advice in ways that fit existing clinical workflows. A central premise of the project was that explainability is a prerequisite for responsible and effective use of AI in healthcare, where clinicians must remain able to understand and take responsibility for AI-supported decisions.

### Explainable AI for obstetric decision support

Within the project, one research track focused on the use of machine learning techniques to analyse ultrasound images with the aim of developing models that could help predict pregnancy outcomes. Rather than treating ultrasound data solely as input for automated classification, the research explored how model outputs and explanations could be structured to support clinical interpretation. A key element of this work was the integration of user studies involving midwives, who were actively involved in assessing how AI-based explanations were understood and used in practice. These studies examined how different forms of explanation influenced trust, learning and clinical reasoning, and how AI-based feedback could complement existing diagnostic practices.

### From research project to spin-out company

Based on the research conducted within Explain Me, the spin-out company *Prenaital* was established to develop AI-based tools for improved detection of high-risk pregnancies. The founding team included Professor Aasa Feragen, who led the Explain Me project, alongside a group of clinicians and researchers with backgrounds in obstetrics, medical diagnostics and AI-supported clinical decision-making, as well as software development and company building.

The company addresses a known limitation in current clinical practice, where a substantial share of risk pregnancies are not identified early enough to enable preventive treatment. Prenaital has developed AI models trained on more than 10,000 ultrasound images from Danish hospitals, enabling the detection of up to 35% more risk pregnancies compared to standard ultrasound examinations. The first product - focused on quality assurance and early detection of abnormal foetal growth – is currently awaiting regulatory approval, with market entry expected in 2026.

In 2024, Prenaital secured patent rights to the underlying AI technology. The company has been admitted to the BioInnovation Institute (BII) and has received funding of DKK 18.3 million from the Novo Nordisk Foundation. In addition, Prenaital has obtained grants from Innovation Fund Denmark and the Export and Investment Fund of Denmark (EIFO).

# 8. DIREC'S ROLE IN THE ECOSYSTEM FOR DIGITAL RESEARCH AND INNOVATION

Digital research and innovation take place within a complex and increasingly dense ecosystem of universities, research and technology organisations, funding bodies, and private-sector actors.

DIREC was established to create connectivity, reduce fragmentation, and strengthen the collective capacity of digital research and innovation across Denmark, while positioning Danish competences more strongly in an international context.

This chapter evaluates DIREC's role in the national ecosystem for digital research and innovation. The analysis is primarily based on interviews with researchers, representatives involved in the governance and operation of DIREC, and actors in the ecosystem. Survey data are used as a complementary source to corroborate and nuance the interview-based findings. The chapter focuses on DIREC's systemic role, its positioning relative to other ecosystem actors, and its visibility nationally and internationally.

## 8.1 A national coordinating platform for digital research

A consistent and strong finding across the interviews is that DIREC is primarily perceived as a national coordinating platform for computer science–based research, rather than as a traditional innovation or commercialisation instrument. This perception is closely linked to the centre's origins and the strategic choices made during its establishment.

Several interviewees with insight into the early phase of DIREC emphasise that the original call from Innovation Fund Denmark was framed as a large-scale research centre in a more conventional sense, where it would have been natural for individual consortia or leading environments to submit competing proposals. Against this backdrop, the decision by the Danish computer science communities to join forces in a single national application is repeatedly described as both unusual and consequential. Interviewees stress that this choice was not self-evident and ran counter to established patterns of east–west competition and institutional positioning within Danish computer science.

This collective response is widely interpreted as a deliberate attempt to address a long-standing structural challenge in the ecosystem. Prior to DIREC, the Danish landscape for digital research is described in several interviews as fragmented, with strong but relatively small research groups distributed across universities and limited incentives for sustained cross-institutional collaboration. Several senior researchers note that competition for funding and prestige had historically reinforced silos rather than collaboration. In this context, DIREC is viewed as a structural intervention, designed not merely to fund projects, but to alter the underlying conditions for collaboration at national level.

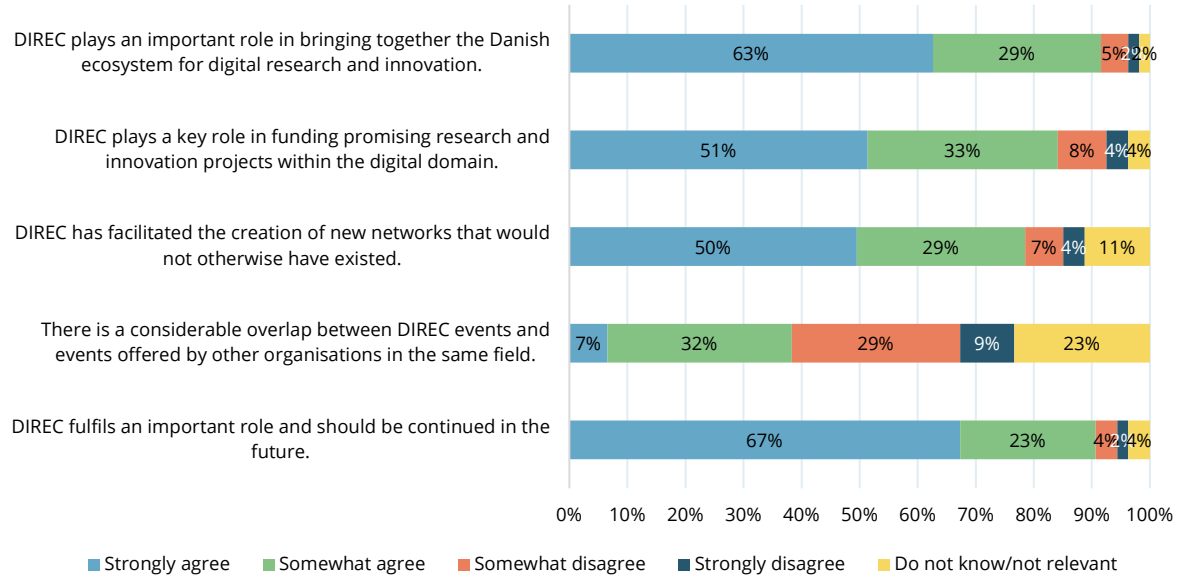
The ability to convene all Danish computer science departments under a shared governance structure must therefore be highlighted as one of DIREC's most distinctive features. Interviewees repeatedly emphasise that no other national initiative has succeeded in creating a comparable forum where strategic discussions about digital research capacity, priorities, and collaboration can take place across institutions. This is seen as particularly important in a field characterised by rapid technological change and increasing international competition for talent and resources.

Survey results strongly corroborate this qualitative assessment. Researchers participating in DIREC activities were asked to indicate the extent to which they agree with a series of statements

concerning DIREC's role in the ecosystem for digital research and innovation. The results are presented in Figure 8.1.

As a key takeaway, the figure shows that a clear majority of respondents agree that DIREC plays an important role in bringing together the Danish ecosystem for digital research and innovation, while an even larger majority agree that DIREC fulfils an important role and should be continued in the future.

**Figure 8.1. DIREC's Role in the ecosystem for digital research and innovation**




*Source: Survey of researchers participating in DIREC activities*
*Note: N=107.*

Figure 8.1 also offers insights on two of the main objectives of DIREC's activities, namely project funding and community building. In particular, the researchers' responses to the three middle statements suggest that DIREC is widely perceived as both a relevant funding actor and a platform for community and network building within digital research. It should be noted, however, that the survey population consists exclusively of researchers who have participated in DIREC, and that the response rate is highest among project managers who have received funding. The results therefore reflect the perceptions of actors who have been directly involved in, and often benefited from, DIREC's funding activities.

## 8.2 Additionality in funding

While DIREC has not introduced fundamentally new funding instruments, the evaluation suggests that its additionality lies primarily in the way funding is deployed, rather than in the absolute size of the grants or in the exclusivity of funding opportunities. Importantly, however, interview findings indicate that this additionality should be understood as enabling rather than uniformly transformative, and that its effects vary considerably across projects.

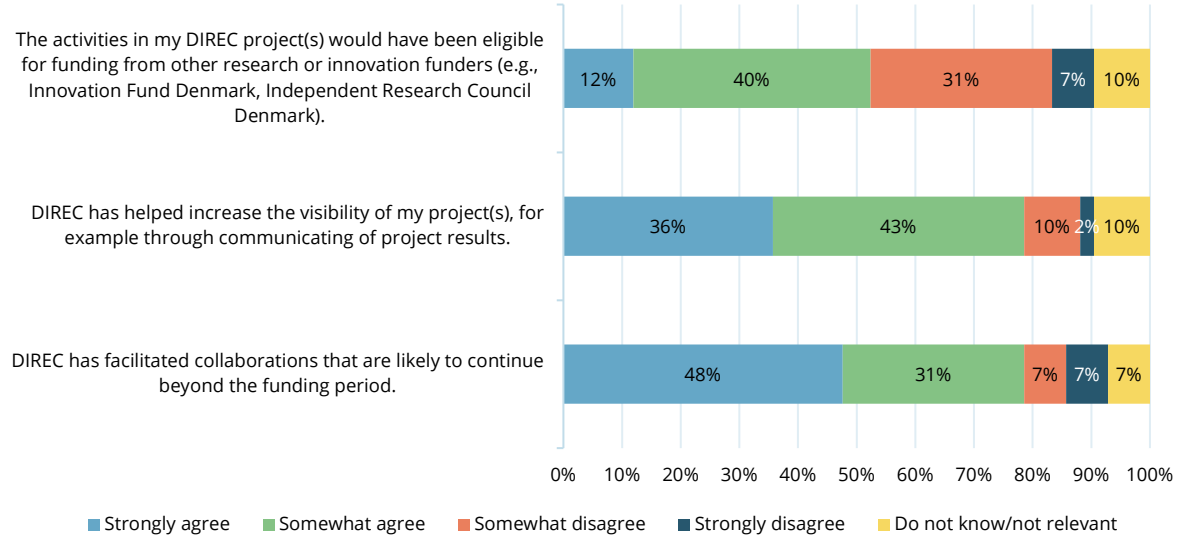
Across the interviews, additionality is rarely discussed in terms of whether projects could, in principle, have been funded elsewhere. Instead, interviewees consistently frame DIREC's added value in terms of how funding is used to encourage collaboration across institutions, rather than in ensuring

deep integration of research activities. In line with the findings in Chapter 4, several interviewees note that while DIREC funding has succeeded in bringing researchers from different institutions together, the depth of collaboration varies significantly. In many cases, collaboration is organised around parallel PhD tracks or loosely coupled work packages, which limits the degree of cross-institutional integration within projects.

A recurring qualitative insight is that the explicit requirement for cross-institutional collaboration has influenced project design and consortium composition. Researchers emphasise that this requirement has lowered barriers to initiating collaboration across universities and created incentives to involve complementary expertise from different environments. At the same time, interviews confirm that these incentives do not consistently translate into tightly integrated joint research. As also documented in Chapter 4, interdisciplinarity is primarily realised within computer science, while broader interdisciplinarity beyond the field depends largely on project-specific choices rather than centre design.

Survey results among project managers provide quantitative support for these qualitative assessments. As shown in Figure 8.2, more than half of the respondents agree that their projects would have been eligible for funding from other research or innovation funders. The same figure also indicates that most project managers perceive DIREC as having contributed to increased visibility of projects and, importantly, to collaborations that are likely to continue beyond the funding period. Thus, the results point to partial overlap with other funding options, combined with a distinct added value linked to the way DIREC structures and conditions the use of funds.

**Figure 8.2. Project managers assessment of additionality and longer-term effects**




*Source: Survey of researchers participating in DIREC activities (project managers only)*
*Note: N=42*

These effects are closely related to DIREC's funding logic: by tying financial support to collaboration and community engagement, DIREC increases the likelihood that projects leave behind durable relationships rather than isolated outputs.

However, as discussed in Chapter 4, the strength and durability of these relationships vary and are highly dependent on project design and leadership.

Taken together, the qualitative and quantitative evidence suggests that DIREC's additionality lies primarily in its relational and systemic effects, rather than in providing funding that would otherwise have been entirely unavailable. From an ecosystem perspective, DIREC thus functions as a catalyst that reshapes incentives and collaboration patterns within digital research, complementing rather than duplicating existing funding instruments.

## 8.3 Community building and relationship formation

Events and community-building activities emerge as a central component of DIREC's ecosystem role. Beyond the direct effects of project funding, interviewees consistently highlight that national conferences, workshops, and cross-project meetings provide important spaces for interaction across research environments and subfields. These activities are described as supporting the ongoing maintenance and reinforcement of professional networks that are critical for collaborative research in a field where institutional identities and geographic dispersion may otherwise inhibit sustained engagement.

A key example repeatedly mentioned is the D3A conference, co-hosted by DIREC alongside the Pioneer Centre for AI and the Danish Data Science Academy. The primary aim of D3A is to bring together researchers, students, and professionals from computer science, data science and AI across Denmark to share cutting-edge research, exchange ideas and build connections across geographical and scientific boundaries. D3A serves as a national arena for knowledge exchange and networking that is difficult to replicate through individual project meetings or bilateral engagements alone.

**Box 8.1. The D3A Conference**

**Hosts and scope**

D3A is a recurring national scientific conference jointly organised by the Pioneer Centre for AI, the Danish Data Science Academy (DDSA) and the Digital Research Centre Denmark (DIREC). The conference has been held three times, with a fourth edition planned for 2026. The conference takes place in Nyborg, Denmark, providing a consistent national meeting location.

The most recent edition attracted more than 500 participants, the vast majority of whom were researchers, including senior researchers, early-career researchers and PhD students. Participation across editions indicates sustained and growing interest in a shared national forum spanning computer science, data science and AI.

**Objectives and format**

D3A aims to provide a national platform for knowledge sharing and networking across digital research fields. The conference typically spans one to two days and includes keynote presentations, parallel scientific sessions, workshops, poster sessions and informal networking activities.

**Participant experience and perceived value**

A short post-conference survey conducted among participants following D3A 2025 indicates very high overall satisfaction. In response to the question *"How would you rate your overall experience at D3A 2025?"*, 48% of respondents rated the experience as *excellent* and 47% as *good*. Furthermore, 71% of respondents found the conference helpful for networking, while an additional 27% reported that it was *somewhat* helpful.

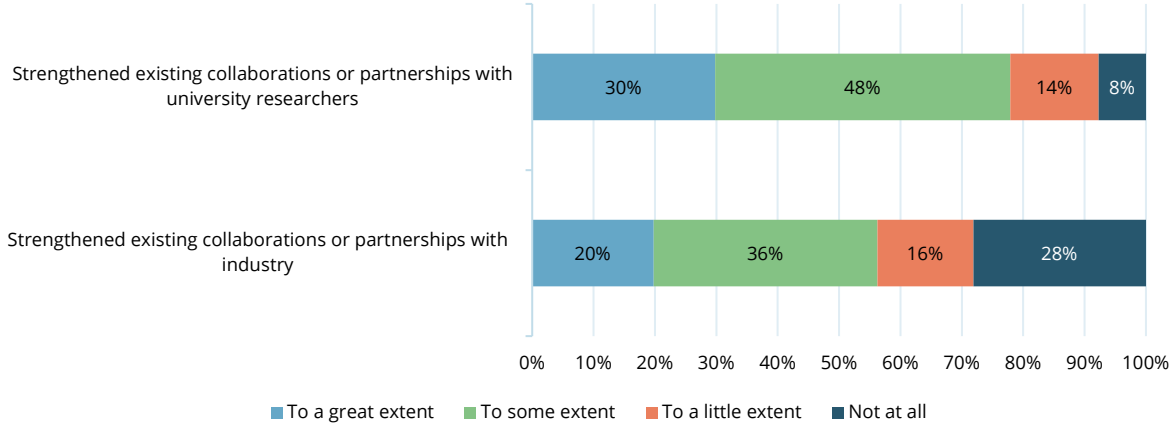
Researchers interviewed for this evaluation describe participation in D3A and similar gatherings as valuable not only for scientific exchange, but also for increasing awareness of who is working on what, identifying potential partners for future work, and situating individual research within broader national agendas. The structured mix of keynote talks, parallel sessions, workshops and poster sessions allows participants to both deep-

dive into specific topics and engage in serendipitous networking across subfields.

In addition to large conferences, interviews also point to more targeted workshops and seminar series as valuable community touchpoints, particularly for early-career researchers seeking mentorship and visibility.

These qualitative insights are echoed in the survey. As shown in Figure 8.3, a large majority of respondents report that DIREC has strengthened existing collaborations or partnerships with other university researchers, either "to a great extent" or "to some extent." Effects on existing collaborations with industry are more mixed, which interviewees attribute to the fact that many events and academic forums are primarily tailored to research-oriented audiences and less directly to industry partners' operational needs.

**Figure 8.3. Existing collaborations strengthened through DIREC**




*Source: Survey of researchers participating in DIREC activities*
*Note: N=104 "Do not know/not relevant"-responses were excluded.*

Survey data corroborate the interview-based assessment that DIREC's community-building activities primarily reinforce pre-existing academic relationships. As shown in Chapter 4, while new networks have been formed, many collaborations remain anchored in established research links and parallel PhD-oriented structures. At the same time, Chapter 5 shows that industry engagement in collaborative activities tends to be exploratory and research-driven rather than transactional or innovation-led, which limits the extent to which community events translate into deeper industry–research partnerships.

In this context, the idea outlined in the original project plan to establish an Industry Club as a structured and long-term interface between researchers and industry was abandoned in the early phase of DIREC. This decision was taken as DigitalLead had been established with a similar purpose, namely to operate a business-oriented membership platform and engagement structure for companies within the digital technology field. Instead, collaboration with industry in DIREC projects has primarily taken place through project-based formats characterised by research-driven agendas and time-limited engagements. Companies typically participate as project partners, focusing on knowledge exchange, access to data, or test environments rather than acting as co-drivers of long-term research agendas.

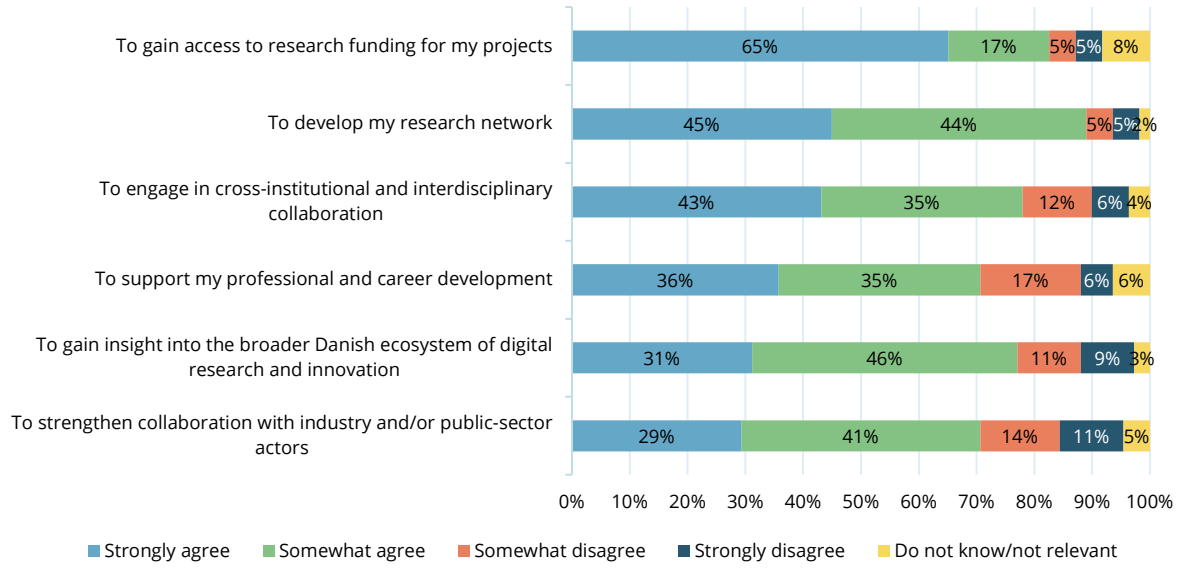
Interviewees point out that this format lowers entry barriers for companies - particularly as many projects build on existing networks - but at the same time constrains the potential for developing the deeper and more durable relationships envisioned in the Industry Club model.

Taken together, the qualitative and quantitative evidence suggests that DIREC's community-building activities play an important but nuanced role in the ecosystem. Their primary contribution lies in strengthening and stabilising academic research networks and providing recurring public forums for exchange, rather than in directly generating new industry partnerships or deeply integrated cross-institutional research endeavours.

While many researchers value the opportunities for interaction and visibility, the interviews also reveal clear differences in how these activities are perceived. Some researchers describe network development and cross-institutional engagement as central benefits of participation, whereas others view DIREC primarily as a funding instrument and attach less importance to its community-building dimension.

This variation is also reflected in the survey data. Access to funding is by far the strongest and most widely shared motivation for participation. Although a substantial share of respondents highlight network development, cross-institutional collaboration and insight into the broader ecosystem as important drivers, fewer than half strongly agree with these statements. Moreover, responses concerning collaboration with industry are more divided. While 29% strongly agree and 41% somewhat agree that strengthening collaboration with industry motivated them to participate in DIREC, a notable share of respondents either disagree or consider this dimension less relevant.

**Figure 8.4. Researchers' motivation for participating in DIREC**

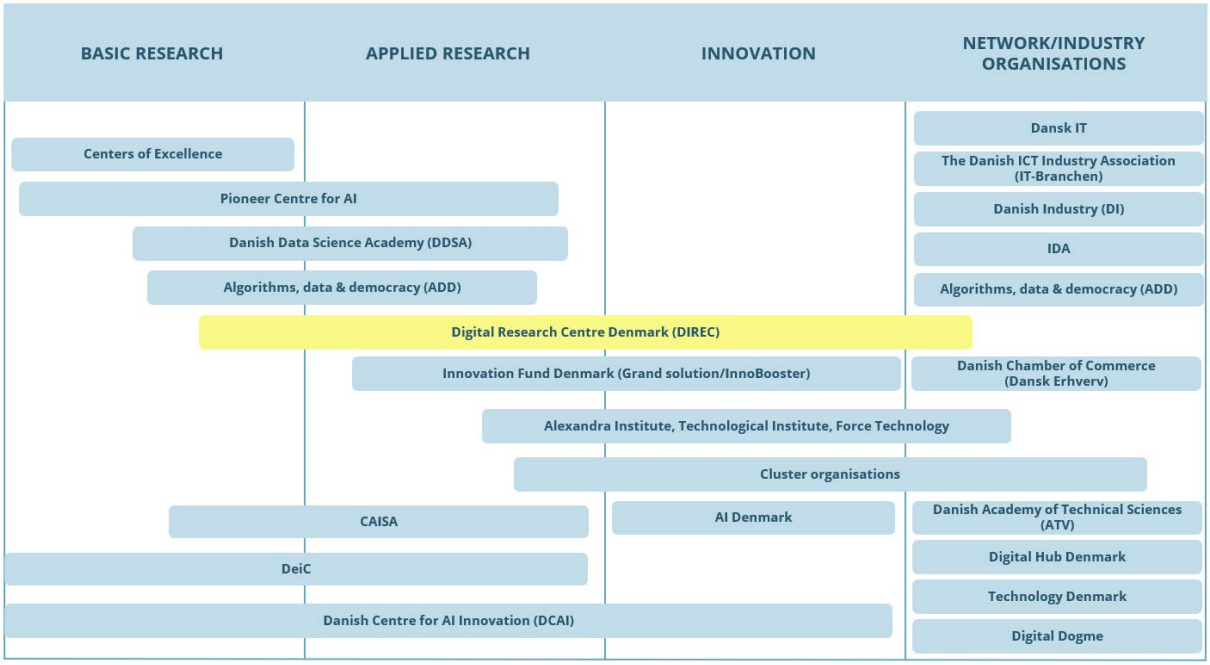



*Source: Survey of researchers participating in DIREC activities*
*Note: N=109.*

## 8.4 Positioning of DIREC in the ecosystem

Figure 8.5 presents DIREC's own mapping of the Danish ecosystem for digital research and innovation. In this representation, DIREC is positioned as a horizontally spanning actor connecting basic research, applied research, innovation actors and network organisations. The figure reflects an ambition to function as a unifying layer across the research–innovation continuum. However, the interview material suggests a more differentiated reality, where DIREC's integration and influence vary significantly across parts of the ecosystem.

**Figure 8.5. The ecosystem for digital research and innovation in Denmark**




*Source: DIREC*

### Strongest role in the research domain

DIREC's position appears clearest and strongest within the research domain. Interviewees consistently describe DIREC as a central national coordinating platform across Danish computer science departments. A particularly strong finding concerns DIREC's role as a neutral convening platform. Several interviewees describe an ecosystem marked by strong institutional identities and symbolic boundaries, where affiliation with specific centres or initiatives can influence participation. In this context, DIREC's broad anchoring across all computer science departments and its non-thematic positioning are widely seen as enabling participation without signalling allegiance to a particular institutional or strategic agenda. This role as a neutral arena is not explicitly captured in the figure, but emerges as one of DIREC's most distinctive and widely valued contributions to the ecosystem.

In particular, the relationship with the Pioneer Centre for AI and the Danish Data Science Academy (DDSA) is described as both overlapping and complementary. In interviews, leaders from both DDSA and the Pioneer Centre emphasise that collaboration around activities such as the D3A conference has functioned well precisely because roles are differentiated and because there is mutual trust, as well as shared strategic vision and direction.

### Infrastructure actors: adjacency rather than integration

Moving towards research infrastructure, actors such as DeiC and the Danish Centre for AI Innovation (DCAI) occupy a different position in the ecosystem. Interviewees describe these organisations as critical providers of compute infrastructure and technological capacity, but not as directly integrated into DIREC's coordination structures. Collaboration occurs at project level - e.g. through access to compute resources - but interviews do not indicate systematic strategic alignment or joint planning between DIREC and infrastructure providers.

Here, Figure 8.5 correctly situates these actors within the broader landscape, but the operational

linkages appear pragmatic rather than programmatic.

**Applied research and innovation layer: partial integration**

Further downstream, the relationship between DIREC and applied research actors such as the Alexandra Institute and other GTS organisations is described as relevant but uneven. Some Bridge projects involve GTS actors in demonstrator or testing activities, but interviewees point out that such involvement depends heavily on individual project design and personal networks. There is no consistent mechanism ensuring that research results are systematically channelled into applied innovation environments.

**Clusters organisations: a clear but underdeveloped interface**

The most frequently mentioned gap concerns the interface with cluster organisations. Interviewees note that project ideas within Bridge and Next Generation projects are typically initiated within research environments and subsequently involve companies, rather than being defined from the outset around challenges articulated by cluster members or SMEs. As a result, the innovation pull from industry is described as weaker than the research push from academia.

While there is no indication of conflict or duplication between DIREC and the national cluster organisations, interviews consistently point to untapped potential. A stronger alignment could, for example, facilitate earlier identification of industry-defined challenges, broaden SME participation and strengthen pathways from research results to cluster-based innovation activities.

Taken together, the ecosystem analysis suggests that DIREC is deeply embedded in the research coordination layer of the ecosystem, moderately connected to applied research actors, and only loosely coupled to cluster-based innovation structures.

## 8.5 National and international visibility

In the original application to Innovation Fund Denmark, DIREC articulated an ambition to become "a worldwide recognised centre for research and education in computer science." This ambition provides an important reference point for assessing DIREC's visibility at both national and international levels.

Across the interviews, there is broad agreement that DIREC has achieved a high level of national visibility within the Danish ecosystem for digital research. Interviewees consistently describe DIREC as a recognised national brand, particularly within academic and policy-adjacent circles. DIREC is widely associated with coordination across computer science departments, national-level events, and a coherent portfolio of research activities. This perception is reinforced by survey results, where a large majority of respondents agree that DIREC has increased the visibility of their projects, for example through communication and dissemination of results (see Figure 8.2 in Section 8.2).

Interviewees emphasise that this visibility is not primarily linked to individual projects, but to DIREC's role as a national platform. Being part of a centre with a broad mandate and strong institutional anchoring is described as conferring legitimacy and collective visibility that individual research groups or projects would have difficulty achieving on their own. In this sense, DIREC's contribution to visibility is closely tied to its coordinating and community-building functions, as discussed in previous sections.

Several interviewees further point out that DIREC has contributed to placing computer science more clearly on the policy and societal agenda, primarily through indirect and research-based channels. Rather than acting as a political advocate, DIREC is described as enabling and legitimising contributions by senior researchers and centre leadership to broader public and policy-oriented debates. Interviewees refer, for example, to participation in expert panels, advisory processes, policy

discussions, and contributions to public debate through articles, opinion pieces and interviews in major national media outlets.

These contributions are typically person-driven rather than institutionally branded, but interviewees emphasise that DIREC provides an important backdrop and point of reference. Being associated with a nationally coordinated centre is described as strengthening the credibility and visibility of such contributions, making it easier for researchers to speak on behalf of a broader academic community rather than as representatives of individual institutions or projects. In this way, DIREC is seen as having supported a more coherent and recognisable narrative around computer science and digital research in societal and policy-related discussions.

At the same time, interviews suggest that DIREC's international visibility is more limited and indirect. While DIREC-funded research contributes to international publications, collaborations and academic reputation, these effects are largely attributed to strengthened research quality and coherence, as documented in Chapters 4 and 5, rather than to DIREC's own international positioning as an organisation. Several interviewees note that DIREC is rarely perceived internationally as a distinct institutional actor, and that awareness of DIREC outside Denmark is often confined to those already engaged with Danish research environments.

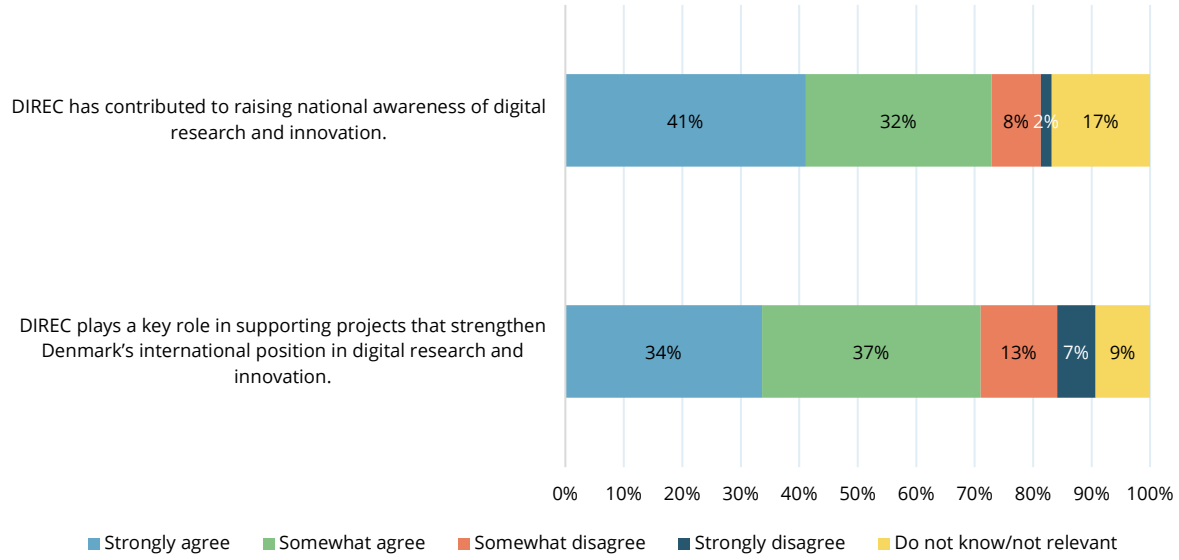
In this regard, interviewees consistently describe DIREC as primarily nationally focused, with international effects occurring as a secondary outcome of domestic coordination and capacity building. DIREC is seldom mentioned as an active gateway to European framework programmes or structured international collaboration. Rather, international engagement is typically pursued by individual researchers or institutions, sometimes building on relationships and capacity developed through DIREC, but not formally mediated by the centre itself.

Several ecosystem actors characterise this as an unrealised potential rather than a misalignment. They point out that DIREC's breadth, neutrality and national anchoring could provide a strong foundation for a more explicit international role, for example by supporting joint participation in EU programmes, facilitating international partnerships, or articulating a clearer international narrative around Danish digital research.

At the same time, DIREC has recently taken steps to strengthen its international visibility and engagement. These include involvement in European conferences, such as co-organising the AI in Science conference and organising a panel at ASCEND, as well as establishing advisory boards with members from leading European research centres. While these initiatives signal an increased attention to international positioning, interviews suggest that the centre's international role remains relatively limited and largely ad hoc at this stage.

This interpretation is supported by survey responses, where perceptions of DIREC's role in strengthening Denmark's international position in digital research and innovation are positive, but less pronounced than assessments of its national role (see Figure 8.6). Taken together, the evidence points to a gap between DIREC's strategic ambition for international recognition and its current operational focus, which remains centred on national coordination and consolidation.

**Figure 8.6. DIREC's Contribution to the Visibility of Danish Digital Research and Innovation**




*Source: Survey of researchers participating in DIREC activities*
*Note: N=107.*

From an evaluative perspective, DIREC's visibility can therefore be characterised as strong at national level and indirect at international level. While the centre has clearly succeeded in raising the profile and coherence of Danish digital research domestically, its potential to act as an internationally visible platform or gateway remains largely untapped. Whether and how this potential should be pursued is ultimately a strategic question, but the interviews suggest that a clearer articulation of DIREC's international role could strengthen its overall positioning in the ecosystem.

## Key takeaways

**Recognised role in the national ecosystem**

- DIREC is widely perceived as playing an important role in bringing together the Danish ecosystem for digital research. Survey results and interviews indicate strong support for DIREC's continuation.
- The centre is primarily experienced as a national academic coordination platform, rather than as a demand-driven innovation actor.
- Collaboration with actors such as the Pioneer Centre for AI and the Danish Data Science Academy (DDSA) is described as complementary and well-functioning.
- By contrast, integration with innovation intermediaries and cluster organisations is more uneven and often dependent on individual projects or personal networks.

**New networks, varying depth of collaboration**

- Many projects bring together researchers from different institutions for the first time. However, the depth of integration varies, and collaboration is in several cases organised around parallel PhD tracks rather than tightly integrated joint research.
- DIREC's community-building activities - most notably national conferences such as D3A - have strengthened academic networks and professional visibility, but their effects on industry collaboration are more mixed.

**Strong national visibility, limited direct international positioning**

- DIREC has established strong national visibility, including contributions to policy discussions and public debate.
- International positioning, however, remains largely indirect and is primarily mediated through the research output of individual projects rather than through DIREC as an institutional actor.

# 9. EVALUATION OF THE CENTRE MODEL AND GOVERNANCE

This chapter evaluates the governance model and organisational construction of DIREC as a national research centre. The purpose is to assess how the governance model has functioned in practice and how it has supported – or constrained – the centre's ability to deliver on its objectives.

The analysis draws primarily on interviews with DIREC board members, participating researchers and company, and ecosystem actors. Survey results are used to substantiate and contextualise qualitative findings. The original project plan and the updated KPI framework provide the formal reference points for assessing whether the governance model has supported the centre's stated objectives.

Where Chapter 8 analysed DIREC's role in the broader digital research and innovation ecosystem, this chapter focuses more narrowly on governance, leadership, programme logic, and administrative practice.

## 9.1 The centre model

### A distributed national construction

As pointed out in Chapter 8, DIREC has succeeded in establishing a centre model covering all Computer Science departments in Denmark.

The centre model structure was deliberately designed to avoid ownership concentration at any single university. Interviewees involved in the establishment phase emphasise that this was not a minor administrative consideration, but a central institutional principle. Given the size of the initial grant and the strategic importance of the centre for Danish computer science, locating ownership at one university was seen as potentially destabilising and politically sensitive.

The solution was to establish DIREC as an independent legal entity organised as an association (Foreningen DIREC), owned collectively by the participating universities and the Alexandra Institute. This construction ensured that no single institution could claim formal ownership of the centre or control over the allocation of funds. The association model provided a neutral governance platform and was intended to create institutional balance and long-term trust among partners.

The board of DIREC consists primarily of representatives at institute leadership level from the participating universities, alongside representation from the Alexandra Institute. This composition reflects the centre's character as a collaboration among academic research environments rather than as a centrally governed research institution. According to interviewees, the board has functioned both as a formal decision-making body and as a strategic coordination forum for Danish computer science more broadly.

While DIREC is organised as an independent association, the secretariat operates administratively through the Alexandra Institute's systems and infrastructure.

This choice reflects both practical and strategic considerations. The Alexandra Institute is not a university competitor in the same way that participating universities are competitors in recruitment and research funding. As a Research and Technologi Organisation (GTS-institute) with an established administrative apparatus and experience in managing collaborative research and innovation projects, Alexandra could host the secretariat without creating ownership ambiguity. Using Alexandra's financial systems, software infrastructure, and physical address allowed DIREC to operate efficiently without building parallel administrative structures.

In practice, interviewees indicate that this structure has functioned without major governance conflicts. The board has maintained collective oversight of strategic direction and funding allocation, while day-to-day coordination has been delegated to the secretariat. The absence of reported institutional disputes over ownership or control suggests that the original design principle – preventing concentration of ownership – has been effective.

At the same time, the evaluation indicates that the association structure has had limited visibility outside the core governance circle. For most researchers and companies, DIREC is experienced primarily through projects and the secretariat rather than through the formal association framework. This suggests that while the association model has been important for institutional balance at leadership level, its practical relevance is concentrated at governance level rather than operational level.

From a governance evaluation perspective, the ownership and board structure appear to have achieved their primary purpose: safeguarding neutrality and enabling national coordination, while maintaining administrative efficiency.

### Research-driven governance

Evaluation findings also indicate that DIREC's governance is, in practice, strongly research-driven. The Board is composed primarily of Computer Science Department Heads from the participating universities, although four major Danish companies are represented. At management level, workstreams are led by senior academic researchers, and as shown in Chapter 5, project ideas have predominantly originated within research communities rather than from companies.

This research-led orientation reflects the centre's origin and stated ambition to strengthen Danish computer science research capacity.

Participating researchers widely regard this as a strength. It has ensured that projects are anchored in established research environments, aligned with international scientific agendas, and capable of producing high academic output. As documented in Chapter 4, the centre has generated substantial scientific production, including conference papers, journal articles, and PhD theses, and has contributed to recruitment and capacity building across institutions (as documented in Chapter 6). In this respect, governance has delivered clearly and consistently on the centre's excellence and capacity objectives.

However, the same research-driven logic also shapes the type of collaborations and outcomes that emerge. As discussed in Chapter 5, early Bridge projects were often conceptually framed prior to company engagement, which limited the extent to which industry-defined challenges shaped project design.

This pattern does not reflect a governance failure but rather an implicit prioritisation. The centre's dual ambition – to strengthen research capacity and to transform research into value for businesses and society – contains an inherent tension. In practice, governance has consistently prioritised academic excellence and cross-institutional research collaboration. Industry impact, while present in a few cases, appears more heterogeneous and project-dependent.

The overall impression is that DIREC is primarily experienced as a national academic coordination platform rather than as a demand-driven innovation centre.

### The role of workstreams

The workstream structure constitutes a central element of DIREC's formal governance design. In the original application to the Innovation Fund Denmark, workstreams were described as thematic "umbrellas" under which projects and activities could be dynamically established and funded. Each workstream is led by a senior researcher and forms part of the management team. Structurally, this design provides thematic coherence and connects project-level activity to the centre's broader strategic priorities.

In practice, however, interviews reveal a more nuanced picture of their value.

Workstreams are rarely mentioned spontaneously by researchers or company participants as a primary source of value. Most interviewees refer instead to specific projects, the secretariat, or large-scale events such as D3A when describing what has mattered to them. For company participants in particular, workstreams are largely invisible; engagement takes place at project level rather than at thematic workstream level.

For researchers, workstreams appear to have played a coordination role in the early stages of the centre, particularly in facilitating matchmaking and the formation of cross-university consortia. The project selection process involved pre-proposal meetings and matching across institutions, and this likely relied on workstream structures. However, beyond this formative function, interview evidence suggests that the intensity and impact of workstreams are rather limited.

## 9.2 Project design and grant administration

### Grant types and overall programme logic

As described in Chapter 3, DIREC's activities have been organised around a portfolio of grant types, including SciTech projects (strategic research), Bridge projects (collaborative research with company participation), Explore projects (smaller exploratory initiatives), educational projects, and, more recently, the Next Generation projects initiated under the extended funding period.

In its first funding phase (2020–2025), financed primarily by Innovation Fund Denmark (IFD), DIREC did not introduce a fundamentally new collaboration model for research–industry interaction. The framework for collaboration largely followed established IFD and university practices. A notable distinction, however, is that DIREC does not provide direct financial support to participating companies. In contrast, instruments such as IFD's Grand Solutions include co-funding mechanisms for companies.

In interviews, the absence of direct company funding has not been described as a barrier to participation. Companies have generally been willing to engage in projects without receiving financial support. However, the lack of subsidy appears to have influenced the level and intensity of engagement. Several company representatives indicate that they entered with relatively moderate expectations regarding short-term commercial outcomes and typically allocated fewer internal resources compared to their engagement in other innovation projects.

This dynamic differs from earlier Danish innovation programmes with stronger application-oriented designs, such as Innovation Consortia and programmes under the former Danish High Technology Foundation (HTF). Those programmes were explicitly designed around technology development and application goals, often with clearly defined commercial or implementation targets. DIREC projects, by contrast, have primarily been structured around research and PhD-based collaboration. As discussed in Chapter 5, when projects are structured primarily as PhD-based research collaborations, the scope for short-term business impact may be more limited. In such cases, company engagement often centres on knowledge exchange and long-term capability development rather than near-term innovation outputs.

In the new funding phase (2025–2027), under the Next Generation calls, DIREC has not fundamentally altered this collaboration model. However, certain requirements have been adjusted. For example, there is no longer a formal requirement regarding the number of participating companies or fixed co-financing thresholds. Instead, the level of company commitment and co-financing is assessed as part of the overall evaluation criteria during project selection. Letters of intent from companies are required to document engagement.

Furthermore, particularly in cybersecurity-related projects, DIREC has made efforts to encourage companies to define problem statements to a greater extent. This represents a partial shift towards a more demand-oriented approach. However, survey results presented in Chapter 5 (Table 5.3) suggest that the extent to which project ideas originate from company-defined challenges remains limited at this stage.

### Allocation of funds

The IFD grant was allocated in three phases. Approximately half of the total funding in the first phase was earmarked for projects that were already described in the original application. These projects were therefore not subject to open competition within the centre.

Several interviewees reflect critically on this arrangement. While it provided stability and ensured a rapid start-up, it also meant that a substantial share of funds was effectively pre-committed. Some describe these early projects as having been "ready in the drawer" and based on existing research collaborations. Although this approach may have ensured high scientific quality and feasibility, it limited the extent to which the early portfolio was shaped through open internal competition or broader mobilisation across institutions.

In later phases, funds were allocated through open calls for Bridge, SciTech, and Explore projects, assessed by an evaluation committee using criteria relating to quality, execution, and impact. The introduction of open calls increased transparency and broadened participation, but it also introduced new dynamics related to company co-financing.

### Company co-financing requirements

In Phase 1, external company co-financing amounted to approximately DKK 20 million, compared to an initial target of DKK 75 million. This left a significant gap to be closed in subsequent phases. As a result, a requirement was introduced that project proposals in later phases should include company co-financing at a level corresponding to twice the public contribution.

Interviewees indicate that this requirement had notable behavioural effects. In some cases, project consortia sought to include multiple companies primarily to meet the formal co-financing threshold. While this broadened company participation numerically, it did not necessarily deepen engagement qualitatively. Several respondents suggest that some companies joined projects with relatively limited operational involvement.

The documentation of company co-financing also became, to some extent, an administrative exercise since the company did not receive any money or compensation for their co-financing. Interviews with company participants indicate that relatively broad interpretations were applied in defining what could be counted as co-financing. This included parallel R&D activities undertaken within the company that were related to the thematic scope of the project, even if they were not formally part of the funded project plan. In addition, resources used to generate or curate data that were subsequently made available to the research project were, in some cases, included as co-financing.

While such practices are not uncommon in collaborative research programmes, they indicate that the formal co-financing figures do not necessarily reflect a one-to-one correspondence between registered hours and direct project-specific activities.

From an evaluative perspective, the co-financing requirement appears to have had mixed effects. On the one hand, it signalled seriousness of engagement and ensured some degree of company commitment. On the other hand, it may have encouraged the formation of broader but less deeply integrated company consortia.

This observation aligns with findings in Chapter 5, where company involvement is described as exploratory and uneven across projects. The co-financing requirement likely increased the quantitative breadth of company participation but may

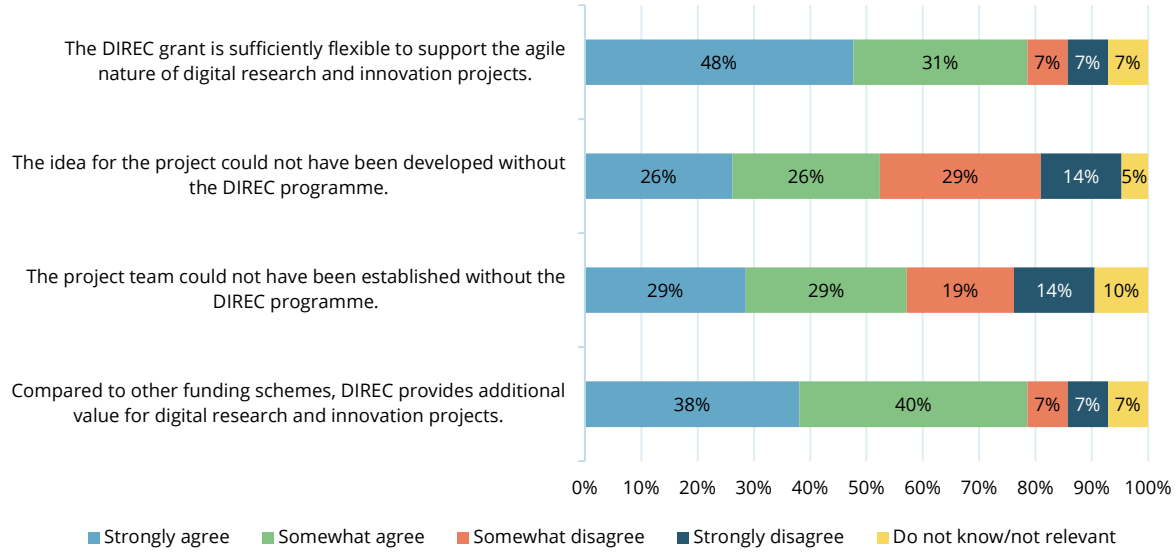
also have diluted the intensity of engagement in certain cases.

### Role of the secretariat

Grant administration in DIREC has been characterised by a deliberately lean and trust-based approach. While the formal governance framework – including board oversight and evaluation committees – provides strategic direction and quality assurance, the day-to-day functioning of the centre relies heavily on the secretariat. Across interviews, the secretariat is consistently described as a central enabling actor in the centre's operation.

Survey results provide a quantitative backdrop to this assessment. As shown in Figure 9.1, a large majority of respondents agree that the DIREC grant is sufficiently flexible to support the agile nature of digital research and innovation projects. Similarly, most respondents consider that DIREC provides additional value compared to other funding schemes.

**Figure 9.1. Project managers' perceptions of flexibility and additional value of the DIREC grant**



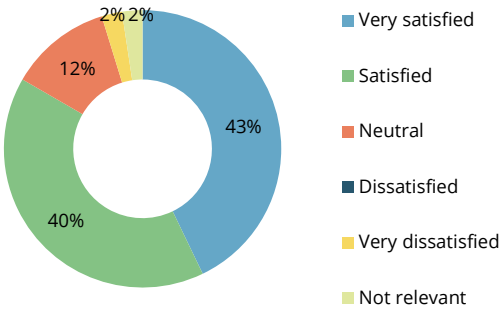

*Source: Survey of researchers participating in DIREC activities*
*Note: N=19. The figure contains answers from BRIDGE and SciTech project managers.*

Interviewees frequently contrast DIREC's administrative procedures with those of larger national or European programmes. The application processes are described as manageable, the dialogue with the secretariat as accessible, and reporting requirements as proportionate. Several project managers note that the administrative framework has allowed them to focus primarily on research and collaboration rather than on compliance-heavy documentation.

This perception of flexibility is closely linked to the secretariat's role. Rather than acting as a control body, the secretariat is widely described as operating through dialogue and guidance. Interviewees emphasise responsiveness, short communication lines, and pragmatic problem-solving as key features of the administrative culture.

Survey data further illustrate the perceived quality of administrative support. As shown in Figure 9.2, satisfaction levels with support prior to project start are high, with the majority of respondents indicating that they are either satisfied or very satisfied.

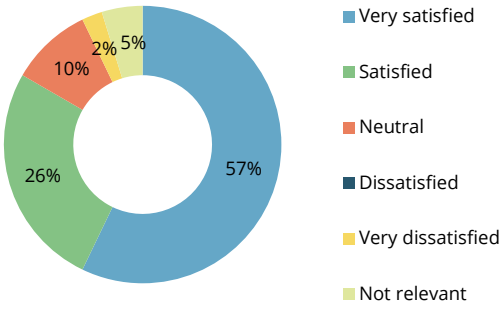
**Figure 9.2. Project managers' satisfaction with project support prior to the start of the project**




*Source: Survey of researchers participating in DIREC activities*
*Note: N=42. The figure contains answers from project managers.*

Satisfaction levels increase further during project implementation. Figure 9.3 shows that an even larger share of respondents report being very satisfied with the support received during the project phase.

**Figure 9.3. Project managers' satisfaction with project support during the project**




*Source: Survey of researchers participating in DIREC activities*
*Note: N=42. The figure contains answers from project managers.*

The positive survey results presented in Figures 9.2 and 9.3 are strongly mirrored in the qualitative interviews. Several project managers describe the secretariat as particularly valuable once projects are underway, assisting with coordination across institutions, clarifying administrative procedures, and facilitating communication between partners.

What stands out in the interviews is not only the quality of administrative support, but also the fact that it is delivered by a very small secretariat. Multiple interviewees explicitly note that they are impressed by the level of activity, visibility, and coordination achieved relative to the limited staffing. Compared to the scale of the overall budget and the number of participating institutions and projects, the administrative apparatus is lean. Nevertheless, it is widely perceived as efficient, responsive, and strategically aware.

In a distributed centre spanning eight universities and the Alexandra Institute, the secretariat plays an important integrative role. Interviewees emphasise that having a central administrative unit reduces friction between institutional systems and provides a neutral coordination point. This is particularly relevant in cross-university projects, where differences in local procedures could otherwise create delays or misunderstandings. The secretariat's neutrality – anchored administratively at the Alexandra Institute but operating on behalf of the collective – is described as contributing to trust and smooth cooperation across institutions.

Beyond formal grant administration, the interviews highlight a broader facilitative and strategic role. Prior to proposal submission, meetings were organised to stimulate cross-institutional consortia and thematic alignment. Although these activities are formally linked to workstreams and board decisions, interviewees frequently attribute their practical execution and follow-up to the secretariat. The secretariat is described as having a strong overview of competencies across institutions and being able to connect researchers who might not otherwise have collaborated.

The administrative model overall can be characterised as trust-based rather than control-driven. Monitoring has primarily focused on overall project progress, based on dialogue between project

managers and the secretariat. Progress is tracked in an online database/dashboard and reported to the board at board meetings. This approach aligns with the centre's research-driven governance philosophy and has contributed to a perception of flexibility and accessibility.

At the same time, the experience with company co-financing illustrates the complexity of balancing trust and accountability. As discussed in the previous section, documentation of company hours and financial contributions sometimes became a formal compliance exercise rather than a substantive indicator of engagement. In such situations, the secretariat's role was to ensure alignment with IFD requirements while maintaining constructive working relationships with project partners.

Notably, no interviewees describe the secretariat as overly bureaucratic or obstructive. On the contrary, it is consistently portrayed as solution-oriented, pragmatic, and supportive.

Importantly, the secretariat's contribution extends beyond internal coordination and project support. As discussed in Chapter 8, DIREC has played an increasingly visible role in shaping the national agenda for computer science and digital research. Interviewees point to the secretariat's proactive efforts in initiating opinion pieces, facilitating contributions to major national newspapers, and reaching out to leading researchers to co-author articles on topics of strategic importance. By identifying relevant policy windows and mobilising the right academic voices, the secretariat has contributed to strengthening the public visibility and positioning of Danish computer science.

Taken together, the evidence indicates that the secretariat has been a central operational strength of the centre – not only in managing grants efficiently, but also in fostering collaboration, strengthening national visibility, and positioning DIREC constructively within the wider research and innovation ecosystem.

## Key takeaways

**Governance model ensures national balance and neutrality**

- The association structure and board composition safeguard broad institutional ownership across the eight universities and the Alexandra Institute.
- The governance design has prevented concentration of control and limited institutional conflicts.
- The secretariat setup, hosted by the Alexandra Institute, has enabled administrative efficiency without creating competitive tensions.

**Research-driven programme logic**

- DIREC has largely built on established funding and collaboration models rather than introducing fundamentally new instruments.
- Project portfolios and workstreams reflect a strong research-led orientation.

**Workstreams: clear in design, limited in perceived visibility**

- The workstream structure provides thematic coherence and links projects to broader strategic priorities.
- In practice, workstreams are rarely highlighted by researchers or companies as a primary source of value.
- Their role appears strongest in early-stage matchmaking and project formation rather than in ongoing project execution.

**Strong and efficient grant administration**

- Grant administration and the role of the secretariat emerge as a clear operational strength.
- Despite its small size, the secretariat is widely perceived as efficient, responsive, and strategically proactive.
- It plays a key role both in supporting projects and in strengthening DIREC's visibility and positioning within the broader ecosystem.
- High satisfaction levels among project managers reinforce these qualitative findings.

# 10. APPENDIX: INTERVIEWEES

### Participating researchers

| Name | Title | Organisation |
|---|---|---|
| Aasa Feragen | Professor | Technical University of Denmark |
| Anders Lyhne Christensen | Professor | University of Southern Denmark |
| Christian S. Jensen | Professor | Aalborg University |
| Claus Brabrand | Professor | IT University of Copenhagen |
| Jaco van de Pol | Professor | Aarhus University |
| Kim Guldstrand Larsen | Professor | Aalborg University |
| Kristian Torp | Professor | Aalborg University |
| Norbert Krüger | Professor | University of Southern Denmark |
| Peter Scholl | Assistant professor | Aarhus University |

### Participating companies

| Name | Title | Organisation |
|---|---|---|
| Helena Grøn Kähler | Senior HR Business Partner and Org. Transformation Lead | Arla |
| Henrik R. Olesen | Senior Manager/Head of Automation Platform & Security Two-Stroke | MAN Energy Solutions |
| Kenneth Richard Geipel | Chief Commercial Officer | Robotto |
| Mads Peter Hougesen | ML Specialist | Novo Nordisk |
| Mads Robenhagen Mølgaard | Department Director | GEO |
| Milad Jami | Head of Global Robotics & Tech Innovation | Novo Nordisk |
| Morten Boris Højgaard | Education Business Owner | Universal Robots |
| Remo Collet | Senior Data Scientist | Velux |
| Stig Grønning Søbjærg | Senior Management Consultant | Ramboll |
| Thomas Iversen | Chief Software Engineer | Enabled Robotics |
| Thomas Young Olesen | Head of Product Compliance | Grundfos |
| Thorkild Kvisgaard | Emeritus Technology Advisor | Grundfos |
| Toke Lund-Hansen | Director of Technology Innovation | Foss |

### YREB-participants and programme leader

| Name | Title | Organisation |
|---|---|---|
| Camilla Nørgaard Jensen | Chief Innovation Officer | Technical University of Denmark |
| Christian Hinge | PhD Student | Rigshospitalet |
| Julius Wirbel | PhD Student | Technical University of Denmark |
| Viktor Stenby Johansson | Industrial PhD Student | Vipps Mobile Pay |

### DIREC board members and ecosystem actors

| Name | Title | Organisation |
|---|---|---|
| Birgit Pia Nøhr | CEO | Digital Lead |
| Børge Lindberg | Investment Officer, Grand Solutions | Innovation Fund Denmark |
| Christian Holstein | Special Advisor | Danish Agency For Higher Education & Science |
| Christian Kjær Monsson | Head of Research | Danish Industry (DI) |
| Jakob Grue Simonsen | Pro-rector | IT University of Copenhagen |
| Jan Madsen | Department Head | Aarhus University |
| Jens Christian Godskesen | Associate Professor | IT University of Copenhagen |
| Kaj Grønbæk | Department Head | Aarhus University |
| Maja Lænkholm | Special Advisor | ATV |
| Malene Stidsen | Programme Manager | Danish Industry Foundation |
| Marie Helene Andersen | Managing Director | Danish Data Science Academy |
| Martin Møller | Chief Scientific Officer | Alexandra Institute |
| Martin Svensson | Department Head | University of Southern Denmark |
| Peter Axel Nielsen | Department Head | Aalborg University |
| Serge Belongie | Professor | University of Copenhagen |

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