



kinit

2021

Report

Dear KInIT supporters,

2021 was an exciting year for the Kempelen Institute of Intelligent Technologies. As the Director General, I'm proud of our achievements and results which we evaluate in this report. KInIT was established on September 9th 2020 and started its operation on October 1st of the same year. 2021 was a year of setting up of the organization processes, establishing industry collaborations, international networking, European grant proposal writing and early results dissemination.

In September 2021, we celebrated our first birthday. After a year of existence, KInIT has become one of the recognized AI research centers, communicating its mission *Connecting industry to excellent science* at the national and regional level and to *Encourage excellent responsible innovation and talent cultivation* at the international level. This year was framed by:

- 11 active research industry collaborations,
- 6 submitted Horizon Europe project proposals,
- 18 scientific outputs made publicly available,
- starting a PhD study programme in collaboration with Brno University of Technology,
- developing and improving leadership and communication skills including popularization of research to the external audience,
- continued building effective operations.

We are pleased and honored to have 14 supporters contributing to our basic research activities in 2021 (12 private companies, one ministry and one individual donor). In the coming months we will continue and strengthen our efforts to promote and explain the importance of excellent responsible research for an open and democratic society.

People and Culture

KInIT continues in building all its development activities with the emphasis on openness, manifesting the open communication and information sharing at the All-staff meetings, team stand ups or workshops. We stimulate collaboration between teams by connecting them at the project level. In 2021, several training sessions and workshops were organized to develop and improve leadership skills, communication or popularization of research to the external audience. It is one of our priorities to create an environment of creativity and trust. Therefore, we continue in developing our leaders and leading by example.

As we grow, it is crucial for all of us at KInIT to share and follow the same direction in our activities. We require that our day-to-day research activities are relevant to our region and country while being

- aligned with the KInIT strategic research areas;
- attractive and timely topics in the world-wide research context;
- beneficial to society and free from ethical concerns;
- economically feasible.

KInIT personnel capacity (2021 monthly average) was 21,15 FTE researchers and engineers, 5,07 FTE operations, 2,6 FTE management (plus 7 doctoral students started in September 2021, 4 interns, 3 volunteers).



2021 Results

KInIT aims to increase talent concentration in Central and Eastern Europe (especially in Slovakia), and to achieve excellence in basic and applied research. Our strategy is based on responsibility, moral integrity and economic sustainability, supported by the team and individual growth that leads to a culture of trust, openness and respect. These goals represent the three key elements of our activities: (i) excellent and responsible research, (ii) R&I in business and (iii) talent concentration and circulation.



I. Excellent and responsible research

KInIT's research topics affect not only a large number of companies in the region but also the entire society. They are fully in line with the EU's green and digital strategy and the regional strategy for research and innovation for smart specialization. Within these key elements we have prepared an unprecedented number of Horizon Europe grant proposals in 2021 (given our capacity and the performance of our region in European projects), connecting KInIT to international researchers and institutions. The results of basic research have been directed to top international venues.



KInIT activities were also recognized by the Ministry of Education, Science, Research and Sport of the Slovak Republic. The ministry supported our basic research, including research carried out as a part of doctoral studies and international research grant proposals preparation, in particular for Horizon Europe and Digital Europe calls.

The major achievements are summarized below:

- **KInIT's first European grant was accepted and launched** ([CEDMO](#), Central European Digital Media Observatory) in a consortium of 8 partners from 5 countries. CEDMO supports the fight against misinformation through fact-checking and media literacy campaigns. KInIT is leading the activity aimed at the creation of AI-based tools for fact-checking support.
- **Active search for Horizon Europe grants opportunities and grants preparation** based on strategic partnership with Civitta resulted in the successful participation in several international consortia and the submission of six Horizon Europe projects in various call



actions (Research and Innovation Action, Coordination and Supporting Action, Innovation Action, MSCA Doctoral Network). Moreover, eight proposals in national schemes were prepared (Slovak research and development agency, O2 Foundation, several ministries).

Standing-out among these is a proposal for the creation of the Center of Excellence (Teaming) in collaboration with two strong international partners ADAPT Center (Trinity College, Ireland) and DFKI (German Research Center for Artificial Intelligence) and two national partners: Technical University of Košice and Slovak Academy of Sciences. The deep discussions during the proposal preparation phase helped us to refine the strategic goals and focus of KInIT.

- **Award for the Best paper at an A-ranked conference received** (RecSys 2021 for [research on auditing social media recommender systems](#)). A total of 15 papers in scientific journals and international conferences proceedings were published.
 - A - rank journals: seven papers (two papers in quartile 1¹, two in quartile 2, one in quartile 3, two in quartile 4), out of which five were indexed in the Current Contents;
 - B - rank journals: two papers;
 - A - rank conference publications: one paper (best paper award);
 - B - rank conference publications: five papers.

To support the community, KInIT researchers delivered 14 reviews on journal papers proposals in WOS Core Collections, followed by many others in international conferences. Last but not least, our researches participated in Program committees of several major venues (A* and A ranked conferences) such as IJCAI (International Joint Conference on Artificial Intelligence), SIGIR (ACM Conference on Research and Development in Information Retrieval), The Web Conference, Hypertext, RecSys (Recommender Systems) and editorial boards of impacted journals such as User Modeling and User-Adapted Interaction, Journal of Intelligent Information Systems and New Review of Hypermedia and Multimedia.

II. Research & Innovation in collaboration with business

Years of experience from abroad show the strong innovation potential of public-private partnerships which continuously serve as an inspiration for KInIT. Combining private sector experience with many years of academic experience brings an understanding of the importance of research for innovation. In 2021, we focused on collaborating with industry on research and innovation (R&I). We also brought the topic of ethical assessment of digital technologies in companies and their products.

The key achievements are as follows:

- **Long term collaborations with industry established** (ZSEE, sfera, Seesame) together with several pilot research projects with industrial partners (Symbiosy by HB Reavis, O2, Innovatrics, Tatra banka, VNET, Gerulata) and two industry PhD projects (Softec, Eset). We

¹ A quartile is the ranking of a scientific journal based on the impact factor, citation and indexing of that particular journal for a specific field. Quartile 1 means the position of the top 25% of journals in a particular field.



started a continuous process of seeking direct collaborations with industry partners for our mutual improvement.

- **First ethical assessments for commercial products executed** in collaboration with our business partners (Innovatrics, Tatra banka). We addressed ethical and societal issues around their technologies and processes. Based on our own risk-based methodology guided by well-known AI and data ethics techniques, we have explored the compliance of algorithms and data with the common moral principles.
- **The first public large neural Slovak language model SlovakBERT** was developed, consulted, evaluated and **published** in collaboration with Gerulata Technologies. SlovakBERT (the first modern model for Slovak language with the so-called transformers architecture) was already exploited in two industry projects and provided a basis for basic research focused on language technologies.

III. Talent concentration and circulation

We aim to motivate young people to build their careers in Slovakia, especially in research and knowledge transfer through innovation. We have integrated academic research skills with the needs and experience of innovative companies and started together with the industry PhD study (Softec, Eset). We have built upon strong partnerships with researchers and research institutions abroad (Jana Kosecka, Branislav Kveton, Peter Brusilovsky) in our PhD programme (in cooperation with Faculty of Information Technology Brno University of Technology, FIT VUT). We also supported and supervised more than 70 bachelor and master students and 4 interns in 2021.

The key results are as follows:

- **Doctoral study programme successfully started** in collaboration with FIT VUT Brno. Seven PhD students started in September 2021; selected out of 61 applicants from 22 countries. Two of whom have an external mentor, three are working on industry topics and two are working on topics within an international project.
- **New website launched** where we regularly share our scientific knowledge in a way that can be understood by the general public.
- **Internship programme started.** Besides the internships, we supervised more than 70 bachelor and master thesis at the Slovak University of Technology.
- **Active science and technology popularization activities**, through active participation in many events and venues (e.g., Slovak Matchmaking Fair, Cassini Hackathons, Women in Technology, Code against Hate, Fraud and anomaly detection in healthcare using AI hackathon). We organized 40+ research and educational seminars including book reading workshops on hot topics.

Brand, Media and Visibility

Gaining brand recognition as a newbie organization was challenging. We created our brand identity and the website where we regularly present and popularize our scientific research in a way that can be understood by the general public. We ran a successful PhD campaign that resulted in



7 PhD students. KInIT's social media presence grew to over 2k followers on [LinkedIn](#) and over 1k on [Facebook](#). The growth of our reach was also supported by numerous articles and interviews with KInIT researchers in major media (e.g., DennikN, TV Markiza, Aktuality.sk, Trend, Ceska Televize).

We organized internal and external seminars on various topics. In cooperation with Innovatrics and HubHub, we established the [Better AI meetup](#), a series of professional events for Slovak experts in artificial intelligence. The [E-tika podcast](#) in its second series brought the social and ethical dimensions of digital technologies into the spotlight.

The passion of KInIT researchers resulted in many useful tools. These tools help us gain visibility and communicate the importance of science, research and innovation to the general public. For instance, we have released the Slovak version of a well-known Bert language model - [SlovakBert](#) with a [web interface](#) to play with it, or a [tool for crowd-based annotation](#).

We were also actively involved in monitoring the regulations and policy proposals in Europe and Slovakia. Based on our expertise in artificial intelligence we prepared and published the [Stance on the Proposal for a Regulation of Artificial Intelligence](#) known as Artificial Intelligence Act (AIA). Based on our expertise in the disinformation domain, we published the [Analysis of selected regulations in relation to the dissemination of disinformation and the behaviour of online platforms](#).

Last but not least, we have joined our efforts with several organizations: American Chamber of Commerce (AmCham), Slovak Alliance for Innovation Economy (SAPIE), International AI Doctoral Academy (AIDA), Alliance for Healthy Infosphere (AHI). We cooperated with several non-profit organizations: Lifbee, Globsec, DigiQ, Leaf and its Growni platform and partnered two educational programs: Grow with Google and Elements of AI.

Finances

KInIT's funding is built up along three main sources: (i) donations, which mainly support application driven basic research, people development and partially also operations, (ii) grants, which support KInIT's core activities including interdisciplinary and cross-sectorial research and international networking, and (iii) industrial collaborations, which focus mainly on applied research and transfer.

The most substantial part of the KInIT costs in 2021 was personnel expenses (78%). Part of the operational costs were financed by services provided for free of charge or at a significant discount, i.e., non-financial contributions (e.g., office spaces, legal services, AI computing infrastructure). KInIT 2021 costs (i.e. real cash flow and non-financial contributions) were 1.4 mil eur.

On the income side, donations had almost 94,5% share of which non-financial contributions reached 9,2% share. KInIT started several research collaborations with industry partners which contributed to 2021 income by 4,9%%. In 2022, we expect the share of industrial collaboration to at least double and significant increase of grants income. As the institute will grow in the future, it is crucial to keep the current donations as well as gradually grow the income from other sources (donors, industry partners, grants, government support).



Research activities were supported by lean internal processes as well as by the suppliers providing flexible online solutions (e.g., accounting, HR services, invoicing, online collaboration). Cost efficiency is achieved through multi-stakeholder support and an effective procurement process.

Concluding remarks

Institutes like KInIT can be found practically in all Western countries. They create a bridge between academia, business, and industry, thus supporting their deeper interconnectedness. KInIT's biggest potential lies in connecting business with research, both basic and applied. Basic research is very important in this context, as it is the driving force of innovation, especially in connection with applied research and knowledge transfer for commercial benefits. It is, in fact, the first time when the private sector directly supports basic research in Slovakia and on this scale.

KInIT can be seen as a catalyst for the Slovak research and innovation ecosystem in the field of intelligent technologies. In the first period of our existence, we mainly piloted processes based on best practices abroad considering the Slovakia context. We also learned a lot from KInIT partners and developed the entrepreneurial mindset of our researchers. I consider this to be one of the key enablers for fulfilling our mission to connect industry to excellent science and to circulate talent.

It is about finding a common ground with our partners from the business world. Our partners teach us to explore the world through the lens of business, and we show them how science can transform their business. However, it is a long way ahead of us. The economy and the ecosystem as a whole cannot be changed all at once. Moreover, for countries like Slovakia, there is a lot of bureaucracy to contend with. That certainly slows down any progress. KInIT can therefore be seen as a pilot project for Slovakia with a well-chosen field of activities. Artificial intelligence has amazing potential for the future, and we want to be a part of it.

I believe that with the support of the private and public sectors, we will be able to build not only a great institution, but also create a replicable experience for other fields. Developing institutes such as KInIT should become the national priority. KInIT can also contribute to addressing the fragmentation of the research and innovation ecosystem in Slovakia and the wider region.

Starting a new organization is always challenging and fascinating at the same time. I am proud of what we have achieved, and excited about the upcoming results and opportunities. I would like to thank all our supporters, donors, collaborators, especially ESET, Tatra Banka, Innovatrics, Sesame, Softec, HB Reavis, PwC and Andrej Kiska.

Maria Bielikova
Director General



Key achievements 2021

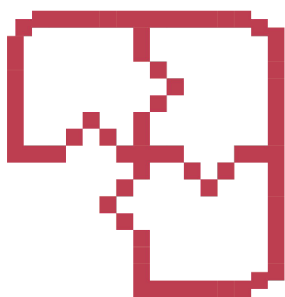


18 scientific outputs made publicly available <p>Our scientific outputs were presented in 15 papers published in scientific journals and international conferences proceedings; one best paper award and 3 tools available on our web.</p>	11 research industry collaborations <p>In 2021, we were engaged in 11 research industry collaborations (6 pilot projects, 5 long term collaborations) and 3 more collaborations were in the preparation phase.</p>	12 international research project proposals <p>We worked on 12 international project proposals (10 Horizon Europe, 1 Digital Europe grant scheme, 1 Visegrad fund), 7 of which were submitted in 2021.</p>	3 international projects in progress <p>Already in the first 12 months of KInIT's existence, we have been involved in 3 international projects as a member of international consortia: CEDMO, TAILOR and Network4Growth.</p>	32 international research collaborators <p>We collaborated with 32 recognized research institutions through their top researchers in preparing grant proposals, mentoring PhD students or writing scientific papers.</p>
1119 sum of citations of individual researchers <p>We gained a total of 1119 citations to our works (as listed in our Google Scholar profiles); the citations were present in papers published worldwide throughout 2021.</p>	14 basic research supporters and donors <p>Basic research activities were supported by 14 subjects in 2021; among them were 12 private companies, one government ministry and one individual.</p>	90 young talents mentored <p>We mentored 90 young talents in 2021: 11 PhD students (7 of them new), 4 other PhD students, 4 interns, 79 junior or senior students in their theses.</p>	80+ research seminars and communication activities <p>We prepared 40+ research and educational seminars, 19 of which were open to partners and were part of 40+ science popularization and policy activities.</p>	2000+ followers on LinkedIn <p>The number of followers on our social media is growing and we reached 2000+ followers on LinkedIn and 2000+ followers on Facebook.</p>

- **KInIT personnel capacity** (2021 monthly average): 21.15 FTE researchers and engineers, 5.07 FTE operations, 2.6 FTE management (plus 7 doctoral students started on September 2021, 4 interns, 3 volunteers)
- **KInIT main research topics:** machine learning methods for natural language processing, information security, green energy, web and user data processing, ethics and values in technology
- **KInIT 2021 costs:** 1.409 mil eur

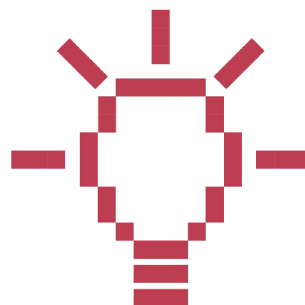
KInIT's mission: Connecting industry to excellent science





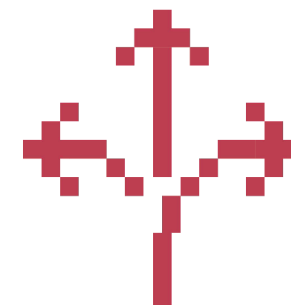
Culture of openness and teamwork

KInIT continues in building all its development activities with the emphasis on openness, manifesting the open communication and information sharing. We keep focusing on the importance of strengthening the team spirit and KInIT values. Our projects are cross-team, stimulating diversity and collaboration. We nurture the research growth by organizing open scientific discussions, continue to stimulate curiosity in young researchers; value flexible work time and work space. It is one of our priorities to create an environment of creativity and trust. Therefore we continue in developing our leaders and leading by example.



Pioneering an effective governance model

KInIT pilots governance model of an independent and non-profit research institution. It puts strong emphasis on retrospective and process improvement; important decisions are usually made collectively and staff of all levels is informed about them in due time; in a shallow organizational structure, project-based teams enjoy a high degree of autonomy; administrative and communication burdens of researchers are systematically lifted by operations team. The Board of Trustees not only approves key strategic decisions, but also guides and advises KInIT's management on a number of business decisions and activities.



Flexible and cost-effective operations

Research activities are supported by enthusiastic and professional operations team, lean and agile internal processes as well as by the suppliers providing flexible online solutions (e.g., accounting, HR services, invoicing, technical infrastructure support). KInIT operates on the principle of collaboration in all aspects, the efficiency of work is ensured by the use of shared documents and other collaboration tools. Cost effectiveness is achieved also due to support of private sector in various services (e.g. HubHub providing office space, discounts to legal services by Zmekova and partners) and the effective procurement process.



- 1. Doctoral study successfully started** in collaboration with Brno University of Technology; 7 PhD students (selected out of 61 applicants) started in September 2021 - two of whom have an external mentor from abroad, three are working on industry topics and two are working on topics connected with an international project.

Basic Research

Applied Research

- 3. The first government support for KInIT research activities was provided** by Ministry of Education, Science, Research and Sport of the Slovak Republic; it was aimed at support of excellent basic research including research carried out as a part of doctoral studies and international research grant proposals preparation, in particular for Horizon Europe and Digital Europe calls.

Basic Research

Applied Research

- 5. Active search for Horizon Europe grant opportunities and grant preparation** based on strategic partnership with Civitta resulted in the successful integration of KInIT into several international consortia and the submission of six Horizon Europe project proposals in various calls (Research and Innovation Action, Coordination and Supporting Action, Innovation Action, MSCA Doctoral Network).

Basic Research

Applied Research

- 2. KInIT's first European grant was accepted and launched** (CEDMO, Central European Digital Media Observatory) in a consortium of 8 partners from 5 countries; the project supports the fight against misinformation through fact-checking, media literacy campaigns and most importantly for KInIT: creation of AI-based tools for fact-checking support.

Applied Research

- 4. Long term research collaborations with industry established** (ZSEE, sfera, Seesame) together with two industry PhD projects (Softec, Eset) and several pilot research projects with industrial partners (Symbiosy, O2, Innovatrics, Tatra banka, VNET, Gerulata Technologies); we are seeking direct research collaborations with industry partners for our mutual improvement.

Applied Research

Transfer

- 6. Award for the Best paper at the A-ranked conference received** (RecSys 2021 for research on auditing social media recommender systems); a total of 15 papers in scientific journals and international conferences proceedings were published; 14 reviews in WOS Core Collections were delivered; membership in Program committees of several major venues (A* and A ranked conferences) such as IJCAI, SIGIR, The Web Conference, Hypertext, RecSys.

Basic Research

Applied Research

- 7. A proposal for the creation of the Center of Excellence developed** (Teaming) in collaboration with two strong international partners ADAPT Center (Trinity College, Ireland) and DFKI (German Research Center for Artificial Intelligence) and two national partners: Technical University of Kosice and Slovak Academy of Sciences; the preparation of the project included deep discussions on strategic goals and focus of KInIT.

Basic Research

Applied Research

Transfer

- 9. First ethical assessments for commercial products executed** in collaboration with our business partners; we addressed ethical issues around their technologies; based on our own risk-based methodology guided by well-known AI and data ethics techniques; focus also on the compliance of algorithms and data with the common moral principles.

Applied Research

Transfer

- II. Contribution to the public discussions on Artificial Intelligence regulation** by KInIT stance on AI Act (AIA) and by supporting the Slovak Committee for Ethics and Regulation of AI (CERAI) during the discussions. KInIT also prepared a study for a member of EP Miriam Lexmann concerning the analysis of regulations on dissemination of misinformation and the behavior of online platforms.

Policies

- 8. KInIT's brand identity and website was created** in collaboration with Seesame; we regularly share our scientific knowledge in a way that can be understood by the general public; in cooperation with Innovatrics and HubHub, we started the Better_AI_meetup, a series of international professional events for AI experts; the second series of the E-tika podcast brought ethical dimensions of AI into the spotlight; we organized seminars on various topics.

Science Popularisation

- 10. First public large neural Slovak language model SlovakBERT** developed, consulted, evaluated and published in collaboration with Gerulata Technologies; SlovakBERT was already exploited in two industry projects and provided a basis for basic research focused on language technologies.

Basic Research

Applied Research

Transfer

KInIT

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Leadership



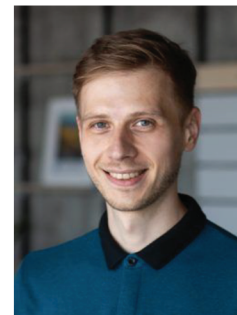
Mária Bielíková
Director General KInIT,
Board of Trustees Member



Marián Šimko
Deputy Director General KInIT,
Board of Trustees Member



Peter Gál
Chief Operations Officer KInIT



Michak Kompan
Chief Research Officer KInIT



Diana Lokere
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Martin Kubík
Deputy Chair of the Board of
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Ján Lunter
Board of Trustees Member,
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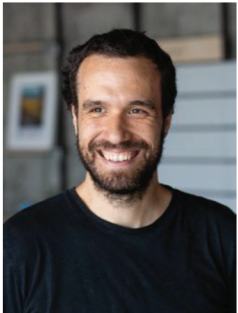


Michaela Benedigová
Board of Trustees Member,
Managing Director & Partner,
Seesame

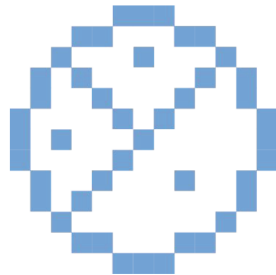


Daniela Chudá
Board of Trustees Member,
KInIT

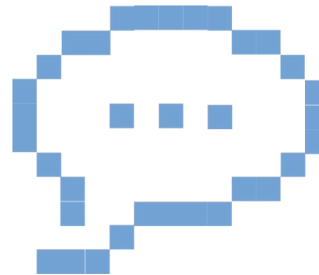
Team Leads



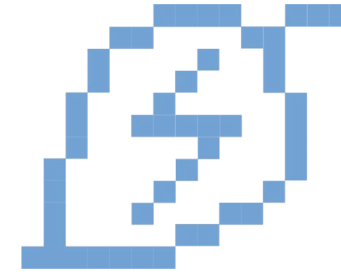
Jakub Šimko
Web & User Data
Processing Lead



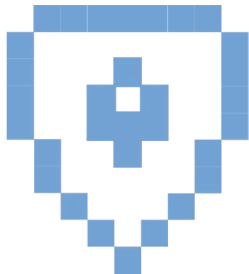
Marián Šimko
Natural Language
Processing Lead



Viera Rozinajová
Data analysis for
Green Energy



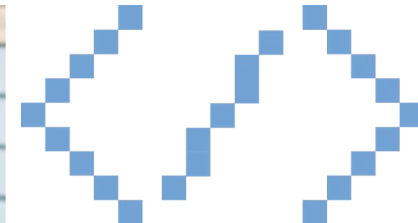
Daniela Chudá
Information Security Lead



Juraj Podroužek
Ethics & Human Values
in Technology Lead



Peter Gál
Operations Lead





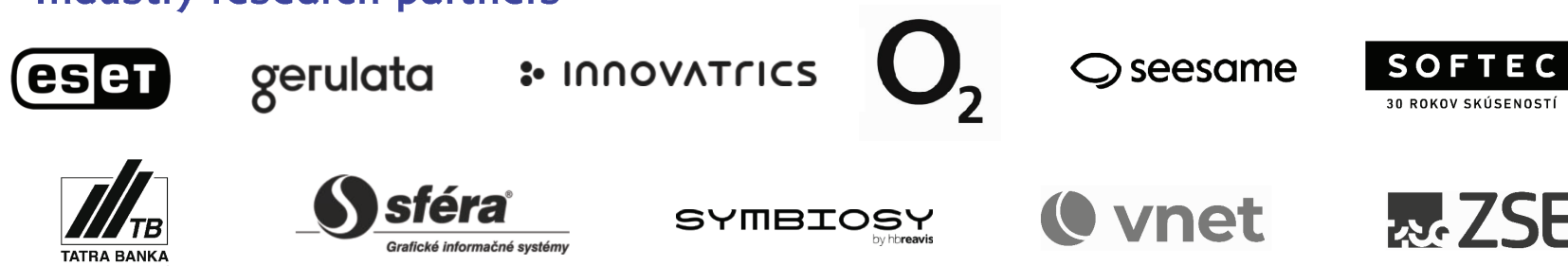
We work closely with corporate partners to put ideas to work



Our supporters help us to grow



Industry research partners



Basic research, including PhD studies, was partially supported also by the Ministry of Education, Science, Research and Sport of the Slovak Republic.

