

Get Smart

#06



INTERVIEW

**Zdeňka
Chocholoušková**



TOPIC

**Intelligent Production
Systems**



INTERVIEW

Anna Krebsová

RESEARCH, DEVELOPMENT AND INNOVATION IN THE PILSEN REGION
Published in June 2024 as part of the project Smart Accelerator
of the Pilsen Region III

Table of Contents

03	Editorial
04—05	Hot News from the Region
06—07	Research and Development in the Pilsen Region: Hard Data
08—11	Interview with Zdeňka Chocholoušková
12—13	Photo Editorial: GoHigher. A Place to Find Yourself.
14—17	Interview with Anna Křebsová
18—19	Interview with Kateřina Podaná: <i>“Modern technology teaches us to look at the world a little differently”</i>
20—23	Interview with Milan Edl: <i>“Technology allows us to figure out HOW to do things, but it is much more important to ask WHAT to do and WHERE things are going”</i>
24—27	A Guide to Creating Visual Identities
28—29	ATC SPACE: Pilsen Region-based Company Heading to Space
30—31	Introducing the Participants of the Autumn Round of the Incubation Program
32—34	Photo editorial: PechaKucha Nights Science Editions

● GetSmart #6

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Detail of a component of Europe's Ariane 6 launcher, manufactured by ATC Space in Klatovy

Dear Innovators, Researchers, and Investors,



I am aware that our region has a high potential for innovation that we need to develop and support. For several years now, the region has been actively involved in outlining the Regional Innovation Strategy (RIS3), trying to coordinate the nurturing of the innovation environment in the region and to improve mutual connections and cooperation between representatives of various sectors. We are examining strategic interventions to find first-rate professionals and securing funding and support to nurture innovation, with a view to promoting the region's reputation in the field of research, development and innovation, both in Czechia and abroad.

I am therefore very happy that this year, we will continue to cooperate with the Business and Innovation Center BIC Pilsen in implementing the Start-up Incubation subsidy program, which will allow us to support the formation and development of young innovative companies across the Pilsen Region. Thanks to the funds from the incubation program, companies will receive methodical support in developing their business plan, feedback and advice from experts or mentors depending on their specialization.

This year we are also continuing our successful Start-up Acceleration program, which aims to contribute to the development of the innovation ecosystem in the region by supporting companies with a potential and ambition to grow further. The program provides mentorship to the management of small or medium-sized companies, utilizing the services of experts who have their own extensive experience in company growth to create optimal conditions for expanding their business.

We have also recently launched the Project Preparation subsidy program within the RIS3 Pilsen Region strategy, which was made possible thanks to European funds from the Smart Accelerator of the Pilsen Region III project. The aim of this new subsidy program is to provide funding to high quality, ambitious strategic projects that are in line with the current RIS3 strategy of the Pilsen Region and have the potential to cause significant improvement in the region. Such projects will also be submitted to relevant calls for international, transnational, cross-border or regional programs.

Besides funding, we also try to support the innovation environment of the Pilsen Region through a number of marketing activities, such as organizing an annual interregional conference, presenting interesting innovation activities on social media, publishing this magazine, or supporting a number of networking meetings and educational workshops.

I believe that thanks to the various forms of support, we will continue to improve the innovation environment in the Pilsen Region.

I wish you all the best of luck and success in your innovation activities and projects. Rest assured that the Pilsen Region will continue to be your source of support.



Ing. Jan Přibáň MBA,
Head of EU Funds and Programs Department,
Pilsen Region

Hot News from the Region

Pilsen Region Will Provide CZK 10 million in Support of Upcoming Innovation Projects

Early this year, the Pilsen Region, through the Regional Development Agency of the Pilsen Region and the Smart Accelerator of the Pilsen Region III project, launched a new subsidy program to support strategic projects in the field of research, development and innovation. The program will support up to 20 projects that will significantly contribute to the development of the innovation ecosystem in the region. The support will focus on drafting strategic project plans that are in line with the Regional Innovation Strategy of the Pilsen Region and will help regional applicants to submit first-rate applications to relevant calls within appropriate international, national or regional programs, or to develop projects so that they are ready for implementation utilizing other funding sources. Subsidies for the preparation of RIS3 strategic projects in the Pilsen Region are available to research organizations and other legal entities. Successful applicants will receive a subsidy of up to CZK 500,000. Subsidies will amount to a maximum of 85% of the project's total eligible costs. Projects will be assessed by the Regional Council for Research, Development and Innovation of the Pilsen Region with the help of outside expert evaluators. To be granted the financial support, a project should significantly contribute to the implementation of at least one of the five key areas of change defined in the Regional Innovation Strategy of the Pilsen Region, specifically Human Resources for Research, Development and Innovation (R&D&I), Environment for R&D&I, R&D Capacities, and Innovation and Marketing for R&D&I. Applications will be accepted until all funds allocated for the program are exhausted, i.e. until 31 March 2025 via the eDotace system.



Key Events for the Pilsen Region Innovation Ecosystem

01

AimtecHackathon 2024

As the name suggests, AimtecHackathon 2024 was organized by Aimtec, a successful Pilsen-based company with a global presence. Programmers were asked to help overcome barriers through code. Over an entire March weekend, dozens of hackers spent 40 hours coding in the Moving Station community center in Pilsen, with a goal to help people who struggle with disabilities. What innovative projects were created at this year's #AimtecHackathon: "When Code Helps"? And did the hackers live up to expectations despite the short time they were given? Teams of talented coders were tasked with choosing one challenge that matched the specific needs of a particular person with a disability. To support their solution, they had a wide range of technologies at their disposal, from speech processing, cloud services and 3D printing, to virtual and augmented reality and smart hardware building blocks. With the support of more than a dozen mentors, the teams were able to come up with a range of innovative solutions that helped improve the lives of people with disabilities. The challenges that the hackers faced included creating apps for a blind person; supporting memory training for a mentally and physically disabled person; completing a support website for cancer patients and their loved ones; or communication cards for children with autism spectrum disorder. The winner of this year's #AimtecHackathon, both according to the audience vote and the expert jury, was team Vision consisting of Jakub Herman, Lukáš Kozel, Daniel Zierl, Tomáš Zierl, Filip Kejval, Patrik Vácal, and Marek Hanzl. For their winning project, they designed an AI assistant for people with visual impairment. The new mobile application serves as the user's "eyes": through a single photo and a set of pre-defined or directly spoken questions, the app can provide the user with the answers they need.

02

PechaKucha Night Pilsen: Science Edition

Would you be able to describe your project, company or research to an audience of 200 people in six minutes and forty seconds? That's how much time ten carefully selected personalities have to deliver their presentations at PechaKucha Night Pilsen: Science edition, which will take place for the third time this October. It was held in Pavlov's Pavilion in its first year, and in the TechTower Science and Technology Park in its second year. This year, interesting personalities from the field of science and innovation as well as from the world of business and startups will meet at the Techmania Science Center. This experimental station for curious minds is a bridge between informal education and a popular tourist destination. It helps students and families to nurture their affinity toward science and technology, and to discover the possibilities of human knowledge. PechaKucha Night is a unique event that showcases inspiring personalities from a wide range of disciplines and industries who are based in the Pilsen region or have chosen the region for implementing their projects. You may therefore look forward to hearing 10 unique stories that will be presented in 20 slides, each of which will only be shown for 20 seconds. Who will you get to see this time? Follow PechaKucha Night Pilsen or GetSmart to find out.



SAVE THE DATE → 11. 10. 2024
Techmania Science Center

03

AI DAYS

In October 2023, the West Bohemian metropolis became one of four Czech cities that was taken over by artificial intelligence for a week. A packed program in Prague, Brno,

Ostrava, and Pilsen offered 100 events and attracted more than 7,000 visitors who had the opportunity to attend interesting lectures, workshops, presentations, and a variety of accompanying events, and to discover that artificial intelligence can be used not only in a corporate environment, but also in everyday life. Tereza Vodičková from BIC Pilsen, the event's organizer, was very positive about the large number of visitors and the way the entire event turned out: "We are very happy with the first year of the event. We take our involvement in the AI Days as an opportunity to get to know Pilsen's diverse AI community, to connect people and to present the best that the Pilsen AI scene has to offer. A significant part of the program covered practical, specific examples of utilizing AI in various fields – in education, research and development, public administration, and business. It was this broad scope that demonstrated various non-traditional contexts AI can be used in, with an emphasis on its interdisciplinarity. The deepening cooperation with organizers from other cities is further proof that we have managed to achieve this objective. Preparations for this year's edition, which will take place from 14 to 27 October 2024, are in full swing," Vodičková said, adding: "The highlight of last year's edition was the AI Awards, the only industry awards in the field of artificial intelligence, which aim to highlight success stories, personalities, companies and organizations that have made a significant contribution to the development of artificial intelligence in Czechia. Pilsen dominated two of the five main categories last year. The main prize in the category of AI in public administration was awarded to JALUD Embedded for the development of a sound event detector. In the societal contribution category, the main prize went to the DOAZARC project of the Department of Cybernetics of the Faculty of Applied Sciences of the University of West Bohemia in Pilsen."



SAVE THE DATE → 14.—27. 10. 2024
TechTower and other venues in Pilsen

Research and Development in the Pilsen Region: Hard Data

Basic information about the region:

605 388

Population as of 1 January 2023

30 %

of the region's population is concentrated in Pilsen

42,8

Average age of the population

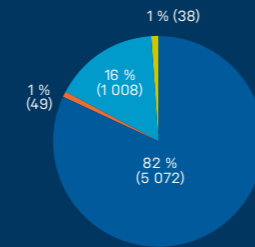
14,5 %

Residents with university education

10,6 %

of university students in the region are foreigners

Expenditure on research and development



R&D expenditure in 2021: CZK **5.6 billion** (CZK 4.9 billion in 2020)

R&D expenditures in the region have increased compared to the previous year

Up to **82%** of total R&D expenditure is concentrated in the business sector, and **16%** in the higher education sector.

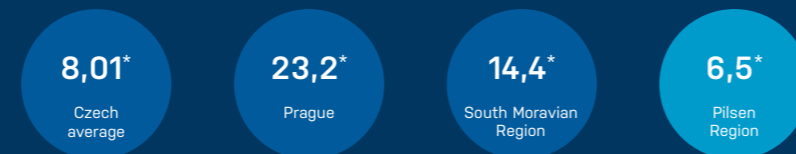
- Business
- Higher education
- Government
- Private non-profit

In 2022, business sector R&D expenditure amounted to **1.5%** of GDP (3rd highest share among Czech regions).

Employees in R&D

3900 (3948 persons precisely). The number of persons employed in R&D has increased between 2021 and 2022 (by 262 persons).

6.5 R&D employees per 1000 residents — The region has the 3rd highest share of R&D employees per 1000 residents in inter-regional comparison.



*R&D employees per 1000 residents

Women in R&D

Significant increase in the number of female researchers in the region:

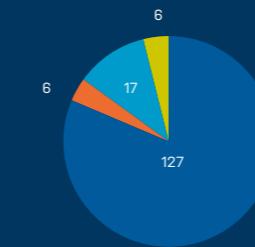


Share of female researchers in the total number of researchers — **14,5%**

3rd lowest proportion of female researchers in interregional comparison

Czech average – 24.2%

R&D Workplaces



- Business
- Higher education
- Government
- Private non-profit

The number of departments with Research as their main economic activity has increased slightly in recent years, to 13 in 2022.

University students

Between 2018 and 2023, the number of students at the University of West Bohemia in Pilsen increased by

7,5 %

10 995 students currently study at the University of West Bohemia in Pilsen.

Almost

13 600

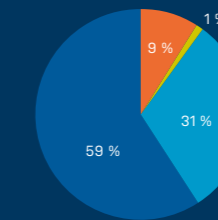
students study at the University of West Bohemia in Pilsen and the Faculty of Medicine at Charles University in Pilsen.

Students in STEM fields

17 % of university students living in the Pilsen region study STEM disciplines



Research and development results



- Businesses
- Public universities
- Individuals
- Other
- Public research institutions

In 2022, **24** patents were granted to applicants from the Pilsen Region

In 2022, a total of **162** valid patents granted to applicants from Czechia were registered in the Pilsen Region,

Most applicants were from the corporate sphere (59%), 31% were from public universities, and 8% were individuals

Corporate research and development

A significant portion of R&D in the region occurs in the field of information technology (ICT) and biotechnology

In the field of Biotechnology, regional companies spent CZK 131 million on R&D in 2021, which represents **6.8%** of the total CZK 2 billion spent on R&D in Biotechnology in Czechia (4th place).

In the area of ICT, regional companies spent CZK 1.1 billion R&D in 2021, which represents **4.3%** of the total CZK 26 billion spent on R&D in the ICT area in Czechia (3rd place).



Research and Development Observatory in the Pilsen Region, 2023.

Significant trends and data from the Pilsen Region are monitored and processed by the analytical department of the Regional Development Agency of the Pilsen Region. Data collected and provided by Czech Statistical Office and the Czech Ministry of Education and Science.

“Information Is Readily Accessible to Today’s Students; All They Need Is to Learn to Work With It”



RNDr. Mgr. Zdeňka Chocholoušková, Ph.D. works as guarantor of talent support at the National Pedagogical Institute of the Czech Republic. She obtained a Master’s Degree in Teaching of General Education Subjects (Biology, Chemistry) and a Doctoral Degree in Applied and Landscape Ecology at Charles University in Prague. Zdeňka Chocholoušková focuses mainly on working with schools and teaching staff in supporting talent, and on connecting various players on regional, national and international level. She has long been involved in teacher education, both on undergraduate level and in lifelong learning. She focuses on botany, biology didactics, field teaching, and the use of activation methods in teaching. She is an active researcher with more than 100 scientific and popularization publications to her name, striving to popularize the knowledge and competences acquired through research, botanical expertise, and domestic and foreign field trips.

Mrs Chocholoušková, what do you think today’s children, or rather today’s students, are like?

They are amazing. They live with us, here and now, and like us, they experience all the benefits and the inadequacies of this world. They are our co-actors on the great stage of life. They are young, kind, boisterous, creative, and full of ideas. It is our children who will determine how our society will develop in the future. They have a much wider scope of opportunities than we did: whereas we were hungry for information, today’s students have unlimited access to it; what they need to learn is how to use it.

We live in a time where AI has developed in leaps and bounds and gained significant influence. We are being flooded with information at any given moment, and we cannot imagine our existence without technology. What to prioritize, how to choose and what to follow? Sometimes it may be too much. It may be the reason young people sometimes tend to live in their own bubble, influenced by social media and its often warped values; they may tend to try to escape from reality, emulating fictional characters with a pure heart and excellent character who can never fail. Let’s be honest with ourselves, however; who among us can claim that we seek nothing but educational content on the internet and social media? But there are many pitfalls lurking in the real world as well, and we need to continuously build up our character to be able to resist them. It is therefore very important to work with young people and try to push them in the right direction. They tend to be extremely grateful and appreciative of the opportunity to be in the right place at the right time, and of someone noticing their potential.

What are today’s teachers like?

Teachers are just as amazing. I often hear people say that teachers are not keeping up with the times as much as we would like; that they are too old; that there are not enough qualified to begin with. Personally, I have met many teachers who are enthusiastic and erudite, who can motivate and set an example, and I dare say it is not about age at all. Many teachers strive to constantly improve, they are lifelong learners, they

follow new trends in education. It is true, however, that many teachers find it difficult to accept changes; they have their established practices, and because they had achieved good results with them in the past, they do not feel the need to change. But this is true of every profession and occupation. So what makes a great teacher, one that we would all want to nurture our children’s talents? We can find a partial answer within the official teachers’ career structure that has been many years in the making but has never been officially implemented; we can also use outside benchmarks, such as the criteria defined by the Global Teacher Prize. It is an award presented to teachers who have had an “*inspiring impact on their students and in their community*,” which is, however, nothing new: a similar sentiment was expressed by Charles F. Browne two centuries ago (“*An ordinary teacher tells, a good teacher explains, an excellent teacher demonstrates, and the best teacher inspires*.”). The precepts coined by Comenius inspire to this day. So what do we really want from teachers? Maybe we should trust them more and let them do what they do best.

People often say that in this country, everyone understands football, health and education, because we have all had experience with it. We definitely all went to school. What do you think about that?

Yes, we all went to school... some more frequently than others [laughs]. Fortunately, school attendance is compulsory in Czechia. Lots of self-proclaimed “*experts*” know exactly how things should be done. Perhaps they should try it some time: stand in front of a packed classroom where every student is different and has different needs, give every single one of them personalized attention, prepare graded assignments (in several levels of difficulty) for each lesson (21 hours per week at full time), while still taking care of their own and their students’ wellbeing. We live in hectic times where most parents are busy working many hours a day and for whom any extra day the students get off school is a huge disruption to their busy schedule. We all excel at criticism, but we’re not so great at making constructive suggestions and implementing solutions. We want

changes to happen as quickly as possible, preferably yesterday, but these things don’t just miraculously happen. You have to put in the work.

You’ve probably heard of the term “*snowflake generation*,” which has become something of a topic recently. It usually refers to young people from Generation Z who are allegedly much more sensitive, self-centered, and convinced of their own uniqueness. Would you agree with this label, or that such young people really exist? Or is it just a journalistic buzzword?

Sure I’ve heard of them; in fact, I have one such snowflake of my own. My son belongs to Gen Z, i.e. people born between 1995 and 2010. I am thrilled to watch his growing interest in particular fields, his ability to critically select information, the humility with which he is able to help his friends and classmates, but also his ability to fall down and get back up again, to face life’s everyday challenges and mishaps. In short, experience is non-transferable... but that has been true for any generation. As a botanist, I am very much interested in the theory of different sensitivity groups (high, medium, and low sensitivity, metaphorically expressed as orchids, tulips, and dandelions; Lionetti et al., 2018; Pluss et al., 2018). As parents, it is our job to raise such children to the best of our ability... And to the next part of your question – as far as I know, the term “*snowflakes*” was first used by American writer Chuck Palahniuk in his novel *Fight Club*, not by a journalist. I am not particularly keen on putting labels on this generation; we are all different, and as Tereza Martínková, the principal of Curie Elementary School, who works with gifted pupils, said in her lecture at the Mensa conference, “Describe a gifted child to me, and I will find them for you in our school...”

And as for being self-centered and convinced of their own uniqueness – I am not sure. It may simply be healthy self-confidence. Due to their higher sensitivity, which may have been heightened by the social isolation during the pandemic, they may tend to be less resilient; on the other hand, they may be more creative, have a fresh outlook and tackle tasks with

more insight. They have a lot of potential, but it's true that they often fail to fully utilize it.

People often talk of increasing demands on students, of the lack of focus, outdated teaching methods, unnecessary memorization... what is your view of such discussions?

I feel the need to stand up for the teachers here. Whenever I talk to them, they tell me that they have been continuously lowering their expectations as regards the level of their students' knowledge; they mention their reluctance to ask for context and related topics. I have seen many teachers implement new methods and openly communicate with students, but also give fair assessment and verbal feedback instead of numerical grades. But of course we are all different, we learn as we go along, and we don't just teach the "ideal students"... In many disciplines, teachers are facing the problem of increased information content, where new information is constantly being added without omitting the less current topics.

You are the guarantor of talent support at the National Pedagogical Institute of the Czech Republic. How are we doing with supporting talented students in Czechia? Is it significantly different from other countries, if you can compare?

It depends on where and how far we look. If we stay in Europe, we will see that support for talented students falls into two extremes: there is either a focus on performance and pushing the gifted students as much as possible; and conversely, an excessive focus on the gifted students' socio-emotional well-being. The ideal is a bit of both. We can find plenty of examples of inspiring practice, but it is never a one-size-fits-all kind of situation. The situation in Czechia is not at all bad, we just need to make the topic of supporting talent a public issue and to effectively connect all the players who can contribute.

What is your agenda at NPI CR? What does NPI CR do, what projects does it work on?

I work as a guarantor of talent support across all of NPI CR's projects (Regional Talent Support Coordinators, school leaders,

FEP revision, counseling, digitalization, career counseling, etc.), but also for outside projects, as is actually evident from the fact that I'm giving this interview. We are preparing a document on Talent Support at NPI CR which will describe all of our activities in detail. We communicate with the Ministry of Education, including setting up a joint Talent Platform which met for the first time in April 2024. I also facilitate and lead a group of Regional Talent Support Coordinators across all regions in Czechia. Their task is to update and expand the Regional Talent Support Networks, as well as publish news, events calendar, newsletters, infotexts, etc. on the website www.talentovani.cz. They provide individual and group support to schools, help set up systems for talent support, and connect various players in the region. They meet twice a year, and twice a year they organize meetings of Regional Coordination Groups in their regions, bringing together the main players in the field of talent support; they organize round table discussions as well as educational programs on talent support.

At NPI CR we also co-organize the Mensa Conference and organize the Meeting of National Talent Support Groups. We use e-learning to provide support to school talent support coordinators and teaching staff; we create new e-learning tools for school talent support coordinators and draw up methodological materials. Biannually, we publish a peer-reviewed professional journal World of Talent. For anyone interested, we are also prepared to discuss the topic of talent support in the online Friday Talks. We are also preparing a course for foreign teachers or training workshops for Smart Accelerators.

The Pilsen Region is working hard to be an innovative region, and talent support is also important for the development of the innovation ecosystem. The region has been working on this for 13 years, especially by organizing various academic Olympiads, competitions and summer camps. The PINE ecosystem now includes the SIT Port, the Robotics Center, and the RADOVÁNEK Leisure Center. Do you think we've done enough?

It's always good to keep trying... but is it enough? I don't know; you should ask the talents themselves, at the GoHigher Café, for example. Find out what else they need, and where the support still falls short. Find out what they can do on their own, and where they would welcome our intervention. Also, you have not asked me about the talent support we provide to schools. The regional talent coordinator at NPI CR sets up a system of talent support in five different schools every year, announces training programs, and offers internships. There are plenty of inspiring schools out there. Educators from all over the country come to the Holoubkov Elementary School and Kindergarten or to the 28th Elementary School in Pilsen to get new ideas. Čapkova Street Elementary School in Klatovy has made an inspiring video about their system of talent support, and their colorful lessons and workshops have inspired many other schools. The Czech School Inspectorate lists the Štěnovice Kindergarten an example of inspiring practice, and its principal was part of a team addressing the methodology of pedagogical diagnostics of talent support in kindergartens. And I could name many more.

Support is one of the key activities within the Smart Accelerator of the Pilsen Region III project. Under the GoHigher brand, the project strives to build a community of talent. Young people attend field trips and meetings both to share their experiences from studies, internships or competitions, but also to make friends, which is often difficult for gifted young people...

I'll start with the last thing you said. I'm not sure whether young people really find it as difficult to communicate as we think. They just do it differently, through social media, the internet, etc. Looking at it from our own perspective, we may not always understand it. I'm a fan of face-to-face meetings, so I find it great that gifted youngsters want to meet, talk, plan together, and share their experiences... and that they may sometimes even welcome us in their midst. ●





A Place to Find Yourself!

The community of talented young people has found its place in the world and meets regularly under the brand GoHigher, which represents various activities organized for gifted high school students in the Pilsen Region through the Smart Accelerator of the Pilsen Region III project. These include project days, field trips or informal meetings at the GoHigher Café.



More information and an events calendar are available on the website podporatalentu.cz or on instagram [@gohigher_cz](https://www.instagram.com/gohigher_cz)

“When we entered the competition, we had no idea what we were getting into.”

A team of young Czech high school students, including Anna Krebsová, a junior at Mikulášská Grammar School in Pilsen, have achieved tremendous success with their space project LASAR. In a competition of more than 2000 teams from all over the world, they made it to the finals of the prestigious Conrad Challenge and won two top awards. Before Anna, Simon, Boris, Richard, and Viktor headed to the final summit in the USA in April to present their idea to NASA experts at the Houston Space Center, we asked Anna a few questions.



You are just getting ready for the finals in the USA as we speak. However, you have already made an incredible achievement. You are the first team from Czechia to make it to the finals and one of the few European teams in the history of the competition! Did you expect you would make it so far? Was there a moment when you said to yourself that it would definitely be a smash?

I have to say that until the last moment before the final teams were announced, I personally didn't believe that we would be among the selected teams that the judges would invite to the finals in the USA. More than 2000 teams from all over the world had entered the competition, after all. When we turned in our work for the semi-final round, I thought it had turned out quite well, but there were still some minor errors. I was happy about it, but I would never have thought we would make it to the finals.

But you knew you were working on something really good, right? I know you had huge competition, but aside from that, surely you must have known in the back of your mind that it was simply incredibly good and that you had a chance?

We are extremely self-critical: as soon as we hand in our work, after any presentation or output, we immediately start discussing what went wrong and what we could improve next time. I think at that point we really didn't have very high hopes. It's important to believe in yourself but not to expect too much. If you don't have high expectations, you can't be disappointed. You can only be pleasantly surprised. And that's exactly what happened.

I have noticed quite a lot of media buzz; your success has been widely reported. Are you happy, did you expect such a wave of interest? After you made the finals, you probably already knew that no Czech team has managed to do this before, and it was an exceptional achievement even on a European level. Not right at the moment, definitely not. However, since we had to finance the trip to the finals in Houston on our own, we decided to approach the regions we come from. They have provided us with the bulk of the funds. Unfortunately, one member of our team

did not receive the amount of support he needed. We decided to set up a public fundraiser on the DONIO platform. The biggest breakthrough came as we started promoting the project. We sent out press releases to the media and had several interviews, we made news reports, and even did live TV appearances.

So had you not promoted the project yourselves, nobody would have known about this great achievement...

It's quite possible. The Conrad Challenge is a competition even I had never heard of before. It's not very well known here in Czechia; people have no idea it even exists. Our success would have most likely remained an entry in the results list on the competition website.

When I read articles about your project, I noticed you mentioning that you would like to inspire others. Thanks to you, a lot of young students will learn about the Conrad Challenge and may be motivated to launch a project of their own.

We hope so, it is one of our goals. With our team being made up of people from all over Czechia, we could reach even further. We are already trying to present the project in Czech schools, whether it's here in Pilsen, or in Brno. We hope that it will reach as many students as possible, and perhaps inspire a group of friends to join in, just as we did.

It's certainly a great way to gain media attention, to have a team made up of students from all corners of the country. Was that the plan from the beginning? This way you can not only inspire in many places, but there is more media coverage, plus you could apply for financial help from different regions... How did you actually put your team together?

It is perfect for the media, but it certainly wasn't the intention. In fact, it makes working together on a project more difficult, since we have to do almost everything online. Direct contact and collaboration is extremely important, and it's often more of a nuisance to be so far apart. Initially, we never even entertained the idea that we would get this far. It was simply something to do outside of school and a chance to learn something

new. We are all space enthusiasts, and we enjoy doing things like that. We actually put the team together thanks to social media, when Simon began asking around Instagram whether anyone would like to join him and enter the Conrad Challenge. Four people got back to him, and that's how we got to know each other: through our friendship with Simon. I already knew Simon and Viktor from previous Expedition Mars competitions and the Czech Rocket Challenge student competition, which we entered as members of the Brno-based Space Carrots team. It was Lukáš Houška from Techmania in Pilsen who put me in touch with them. I used to attend Techmania's Club for the Gifted and Thoughtful. About a year ago Lukáš forwarded me an e-mail from Simon saying that they were looking for new members for the Space Carrots team.

You found each other on social media, which may be sending a message to parents, showing them that social media doesn't have to be a waste of time. Besides, you could simply be hanging out away from school in your spare time, but you have such noble interests as aerospace and aviation. I imagine that not all your classmates have such sophisticated interests, do they?

I think it's very individual. In my class, for example, no one else has such an in-depth interest in the aerospace field, or at least not that I'm aware of. But everyone has a hobby, something they pursue in their spare time. Whether it's sports, music, or any other leisure activity, languages, scouting, whatever. I'm sure I'm not the only one who is this deeply interested in something. We are already at an age where most people have at least a rough idea of what they would like to pursue in life, what they don't like and don't like and what they want to spend extra time on. There are really many directions one can take. Everyone enjoys something different. And when you really want to go the extra mile, you will usually find a way.

I was wondering whether you think aerospace is a difficult field to succeed in, or whether you find it easier because not as many of your peers are interested in it. What do you think?

I don't think one is easier than the other. Competition is steep everywhere, be it sports or aerospace, especially on a global level. As far as the Conrad Challenge is concerned, the competition is enormous, particularly with students from America and Asia. Those cultures have a completely different approach to education. The culture is just different. It's also worth mentioning that the Conrad Challenge has several categories. Apart from Aerospace and Aviation, there are three others: Cyber-Technology & Security, Energy & Environment, and Health & Nutrition. That is a wide enough range of subjects for almost anyone to find something of interest.

I was in no way trying to suggest that Competition in the Conrad Challenge is not as steep. You've made an incredible achievement. I was simply wondering whether there are many people interested in aerospace. Your classmates probably have slightly different interests, as you've already mentioned. You're also the only girl on your team. How many girls your age are passionate about space? You're right, there aren't that many, and I think it's a pity. At the various aerospace and engineering competitions, I have mostly collaborated with boys, with only a few exceptions. For example, I was the only girl in the Techmania club, the Space Carrots rocket team, and I am the only girl in the LASAR team. But I want to believe that there is a girl out there who will be inspired by our journey and will not feel intimidated to work with boys. Personally, I feel much more comfortable working with boys: everything is clear and simple. Women in science are on a level playing field with men today. There are a lot of smart people my age, but they probably don't have the confidence, courage, or interest to go the extra mile. There are countless competitions young people can participate in. Our project has been going on for almost nine months now, we started last August. However, it has only been for the last two or three months that we had to work on it for several hours every day. Obviously, we had to set other things aside to be able to focus on this one project, but it was our choice, and everyone has the opportunity to choose the path that's best for them.

It's a well-deserved success, you really applied yourselves to this project. You are exceptionally talented. Perhaps, as you said, there could actually be more extraordinary talents like yourself if they worked harder and put in the time.

I certainly wouldn't call myself an exceptional talent. I think it's basically about having a logical mind, a natural common sense. If you want to learn something more, especially nowadays, with free access to the Internet and artificial intelligence, it's easy to find any information you need. It is essential, however, that you put in the time. Let's say we divide tasks among all team members, and I get assigned something that has me stumped, I would never simply say, *"I don't know how to do this."* I'll find all the necessary information and solve it. It's not a big deal if you spend some extra time on your phone every day. When used productively, today's technology can be more of a time saver. AI can also help if you use it effectively.

I'll say it again – you are extraordinary, especially in your attitude. You said it yourself – a lot of people are just not willing to put in the extra time. You can scroll through Instagram on your phone, but you can also look up information about space. Success in the competition would mean offers of scholarships to study in the US for all of you; in fact, you have already received such an offer. Have you given it any thought, or have you in fact decided whether or not you want to study in the US?

All the finalists, including us, have already received scholarship offers to about five different American universities. It's probably a once-in-a-lifetime offer. I spent the whole of last school year studying at a high school in Germany, so I'm glad to be back in Czechia for now. I don't graduate until next year, then we'll see. I'm not sure whether I really want to focus on aerospace straight away. I'm more drawn to transport aviation. The offer of US scholarships is definitely worth considering, if only for the opportunity to improve my language skills. Right now, however, I'm more inclined to continue to the Faculty of Transportation at CTU, majoring in aeronautics.

Maybe when you actually find yourself on American soil at your April presentation, when you get to breathe the American air, it will help you realize whether you actually want to go.

I love to travel. But then I look forward to going home all the more. The more new places I see, the more I appreciate the ordinary things we have here in Czechia. I can't pretend to know whether I will go to college in the US next year or stay here in Europe.

How do your classmates see your success? When they read articles about you, do they come up to you and tell you how good you are? Do people who wouldn't give you the time of day suddenly want to be your friend? Do people realize what you've achieved?

I really don't think so. I don't think it's that widely known. Perhaps there will be more of a buzz when we come back from America. But right now, not so much. I go to a six-year grammar school, and I'm in my fifth year now, so we've all known each other for quite a while. It's not like I get to talk to everyone in the school every day. Moreover, I've virtually skipped the last school year, I'm working on getting my driver's license and I spend as much time as possible working on our project, so I don't spend a lot of time in school, and my relationship with my schoolmates is a bit different. I guess I'm not exactly a normal student. I pretty much only go to school to take tests. I don't normally chat with my classmates about what I do. Some of them obviously follow us on social media, where we post news. So they're aware, but it's not like we talk about it much, except in a small group of friends.

Do you have an individual study plan, or do you manage to go to class like everyone else?

I take regular classes, but lately we've had to do a lot of publicity stuff, present our work at universities and at the opening ceremony at the Chamber of Deputies, and many other activities that mostly take place in the morning, so I approached my teachers to give me a bit of a leeway. Just so they know the reason behind my poor attendance.

I imagine they're not too worried about you flunking out.

I try to keep my grades up, but my time is limited now. I can't go full tilt at everything and be the best in everything I do. But I think my teachers are aware that I have other interests and they tolerate them.

What are you most looking forward to in America and how have you been preparing?

We have a four-day program ahead of us. There will be an opening ceremony, then two days of presenting and defending our work to NASA experts, and results will be announced. We will also have some interesting lectures by astronauts. One day is dedicated to presentations, which means that each team gets to present their project to a panel of expert judges and other participants. I think we will have 8 minutes to present and then 20 minutes for questions and a discussion with the judges. The next day there will be an EXPO, where we will have our own booth with promotional materials and we will present the project to the judges, astronauts, as well as the general public who come to visit the space center. On the last day, we will get to tour the space center, and the award ceremony will take place that evening. We will be flying in a day earlier so we can acclimatize. We'd like to make the most of this time to prepare. We're looking at a 15-hour flight, and a 7-hour time difference. If we can, we would like to go to SpaceX's Starbase at Boca Chica, where they are currently testing the new Starship system. Starbase is located in Texas, about 6 hours drive from Houston. As for the actual preparations, we're putting the finishing touches on those right now. We had to submit our final materials last week, i.e. our presentation and the so-called briefing deck, which is a description of the innovation that the judges will receive before our presentation. We're basically just rehearsing now. This weekend we will all meet in Brno to try out the presentation one last time before we leave.

You had to obtain the funds to finance your US trip from your home regions. You decided to raise the rest of the money through the Donio platform and raised the required

amount almost immediately. Did you expect – or hope – you would get the money this soon when you started the fundraiser?

This all depends on how well you can promote your fundraiser. We already had media contacts from the past and people who were willing to promote the fundraiser, so I admit that I wasn't too worried that we wouldn't make it. But no one would have expected to get the money in just four days, obviously.

I didn't expect it either – but then again, you had everything so well prepared and presented your project so well, it was really admirable. I'm sure you speak excellent German, and you must know English as well. You have been working on a great project with four boys, you've been doing driving lessons... At the age of 18, you're going to present your project to NASA in Texas. You are also extremely media-savvy. I'm a lot older than you, so naturally I don't know that many people your age, but how many young people are that passionate and hard-working? Hats off to you! However, aren't you at least a little chagrined that you had to raise the

rest of the money through a fundraiser, and didn't get any support from the Ministry of Education, considering you are the only Czech team and one of the few European teams to make it to the Conrad Challenge finals?

I submitted a request to the Ministry together with our patron organization Nvias. We had to submit our application by the end of 2023, and at the time we weren't really sure if we would even need the funding. We already knew we had made the semi-finals, but we had no idea whether we would make it to the finals. We were thinking ahead, though. If things worked out without us having even started to make preparations, we would have had a big problem, since we only had about 6 weeks to secure funding and make other arrangements. So we applied to the Ministry of Education with the qualification that we were not certain if the money would even be utilized. Unfortunately, the Ministry denied our request even before the results were announced. We are however incredibly grateful to our regions because it was the regional administrations that have given us the bulk of the funds. ●



“Modern technology teaches us to look at the world a little differently”

Intelligent Manufacturing Systems Specialization Through the Eyes of Bc. Kateřina Podaná, RIS3 Strategic Projects Developer



When you say, “intelligent manufacturing systems” or “Industry 4.0,” what is the average person to imagine?

That is a difficult question to start with. The fourth industrial revolution, or Industry 4.0, is a topic worthy of several books. Let me try to put it as simply as possible. It’s actually about using modern systems to make work easier and more enjoyable for people. We have moved from the traditional lathe to programmable CNC machines that can machine more parts more accurately. Important components of individual machines or parts are fitted with sensors that can immediately alert to a possible problem so that the part can be replaced before it breaks and the whole machine stops – something we call predictive maintenance. Output quality control of the finished product is performed using precision cameras that can detect even the smallest imperfections and will not let a poor-quality product through, without people needing to strain their eyesight. And we all like to play with the online

language models that can reword a text or create a cheerful picture for us. What I like about these technologies is the plethora of possibilities that are opening up to us and will surely continue to open up in the future. They also have the potential to interest more people, and to teach us to look at the world a little differently.

Intelligent manufacturing systems (IMS) are one of the five specializations of the Pilsen Region. What is the reason behind that? Is it because they are widely used by local companies in the region, and/or are local companies devoting a lot of time to their development?

We have companies in our region that specialize in developing these systems for various industries, such as for logistics and warehousing, the operation of filling lines, control units for cars, or various “embedded systems,” such as cash registers in supermarkets or monitoring systems in hospitals. Predictive monitoring systems are also being

developed for brakes in rail vehicles. Last but not least, we also have companies that focus on virtual and augmented reality that can be utilized, for example, in the training of rescue workers or in physiotherapy.

Our region has a long tradition in the engineering industry. Where do we stand in terms of the use and development of IMS compared to other regions?

I would venture to say that almost every company is working with some form of intelligent systems these days; whether it be simply utilizing an attendance system (and let’s be honest; we all know that even a simple tool like that can save an accountant or HR manager a lot of time and nerves). What I personally find most interesting is the interdisciplinary nature of IMS. Again, I will use a simple example of virtual reality: the traditional engineering industry invents and creates glasses; programmers then get them to function properly, so people won’t feel nauseated using them. Finally, medical

professionals step in, and the joint effort results in a system that will help you regain movement in your arm after an injury, even if you thought you’d never be able to move it again.

So we could say that IMS pertain not only to certain industrial sectors, especially engineering, as we have already mentioned, but have spread to many other areas?

Intelligent systems are relevant not only to all possible industries, but also to all possible human activities. It is up to us to decide when, how and which ones to use.

Would it be fair to say that companies will need to adopt IMS to survive?

Well, they would be foolish to do otherwise. But on a more serious note, this may be an unnecessarily stringent question. There is another issue which hasn’t yet come up and we all encounter it on a daily basis: digitalization. If not done well, digitalization may be more of a hindrance than a help, but that could be said about anything. We should look at it positively though. We all remember the times when you had to use a separate device for everything: a phone for making a phone call, a letter or telegram to contact someone in writing, a camera for taking pictures; video cameras were an extra treat, used mostly for special occasions; and you had to wait a week for the next episode of your favorite TV show. Obviously, we now live in different times, and that’s mostly a good thing. None of us want to stand in line to file their tax return when you can simply send it via a data box, not to mention that it can get processed much faster since our data do not need to be manually put into the system. Digitalization opens new opportunities. Obviously, it also brings new threats and demands, but it is worth it.

Are there any areas where IMS cannot not be used at all, or conversely, where they have become indispensable?

Asking a digitalization enthusiast whether something is impossible is real fighting talk. Let me look at it from another angle. Every business wants and needs to make a profit and considers every cost. For example, a small company that focuses on custom

manufacturing, with each of its products being different in terms of material flow and processing, probably won’t have much use for a great digital warehouse management system using barcodes or QR codes because it only ever has the few things it needs for the next order in its warehouse.

But then again, we should consider the impact a smart solution can make, for example in social services. Some hospitals abroad have already begun employing small robotic transporters: a nurse draws the patient’s blood, but no longer has to take the tube to the lab – they just give it to the robot to carry. This will give the nurse a little extra time to talk to the patient, exchange a few kind words, hold their hand. These are the kind of situations where we need purely human “intelligent systems.”

Can you name any companies in the region that specialize in IMS?

It would not be appropriate for me as a developer to promote a particular business, and I am bound to leave someone out, for which I can only apologize. But I’ll try to name at least those who have been most active in the field, and we’ve been working with them for a long time. Aimtec, which is based in Pilsen, focuses specifically on systems for logistics and warehousing. Its customers include both large global automotive companies and smaller Czech companies. Then there is Compteq, a small Pilsen-based company that specializes in embedded systems – compact control computers for all possible fields of applications: from supermarket checkout registers, to submarines, healthcare, or large knitting machines. Also interesting is Konplan, which focuses on beverage production lines. Or ZAT, which programs control systems for (nuclear) power plants and other facilities. Speaking of nuclear engineering, we should not leave out Škoda JS, which has many years of experience in nuclear plant control systems. We also have clever start-ups, such as Jalud Emmbded and their “smart ears” – a system that can assess risks by sound signals. If a café in the town square catches fire, the system will alert the fire brigade before you even remember which number to call. I have already mentioned virtual reality a few times: in our region, virtual


reality is utilized for working with people (augmented or virtual reality goggles can be very useful, for example, in the training of new employees, such as Occupational Safety & Health training), health care (VR is successfully used in physiotherapy), or in schools. Schools have begun to utilize special thermal imaging cameras, manufactured by the Pilsen-based company Timi, for various study projects. We should also mention the universities and research organizations we have in the region. I am sure most people are aware the Czech Radio project “Gott Forever.” Experts from the Faculty of Applied Sciences of the University of West Bohemia in Pilsen did the bulk of the work required to “program Karel Gott’s voice.”

The IMS specialization has given rise to the establishment of the ISM Regional Innovation Platforms. Could you tell us a little bit about the platforms’ meetings, the topics discussed, and the advancements that have been achieved in the field?

There are currently five Regional Innovation Platforms, one for each smart specialization. In previous years, these platforms have helped us outline Pilsen Region’s development strategy, which we are now trying to implement. That is why we need help and feedback from the companies involved in Intelligent Manufacturing Systems. We would like to meet with them at least once a year to discuss current topics and new trends. The next meeting will most likely focus on AI and various aspects of working with it.

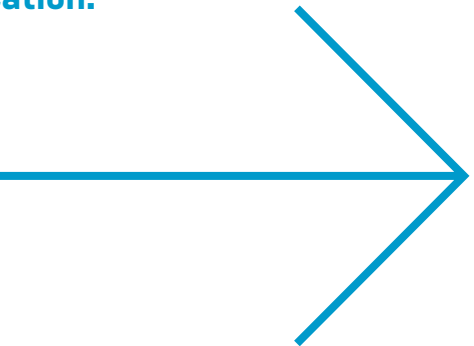
What is currently being planned in the region in regard to the IMS specialization?

Aimtec has recently held its three-day hackathon. We also briefly discussed smart solutions at a meeting on sustainability held in Konplan. In May, we discussed the issue of cybersecurity with Enterprise Europe Network and CzechInno. Further events and developments related to AI are expected to happen in the fall. However, IMS is a field which is constantly developing, so this is by no means a complete list. Invitations to interesting events can be found on our website www.inovujtevpk.cz or on our social media pages. ●



“Technology allows us to figure out *HOW* to do things, but it is much more important to ask *WHAT* to do and *WHERE* things are going”

Doc. Ing. Milan EDL, Ph.D. is the regional RIS3 manager in the Smart Accelerator of the Pilsen Region III project and the Vice Dean for Public Relations and Development at the Faculty of Engineering of the University of West Bohemia in Pilsen. He is also an expert guarantor of the Intelligent Manufacturing Systems specialization. Having graduated in Industrial Engineering and Management at the Faculty of Mechanical Engineering of UWB, he was appointed assistant professor in 2009 in the field of Mechanical Engineering. From 2014 to 2022 he also served as Dean. His professional activities focus on sustainable production systems and the implementation of modern technologies within Industry 4.0 in industry and education.



Imagine you would have to explain Intelligent Manufacturing Systems to a first grader: what they are, where they came from, and where and how they are currently being used. What would you say to explain the issue as clearly and succinctly as possible?

An intelligent manufacturing system is like a smart factory where machines, computers and people work together to produce things faster. Imagine you have a robot friend who helps you put together a jigsaw puzzle. This robot knows exactly what piece you need and when you need it, and even tells you how to put the pieces together correctly. A robot like that will help you complete the puzzle faster and without placing any pieces wrong. So an intelligent manufacturing system is like a big, smart factory where robots, computers and people work together to do things efficiently and manufacture things faster and with more precision.

People sometimes describe the current era as the fourth industrial revolution, characterized by the application of information and communication technologies in the industrial environment. It is also referred to as Industry 4.0. How far back would you think this “revolution” started? Can we even determine that?

I have to admit that I have a bit of a problem with the label Industry 4.0, because it is not only about industry, but about society as a whole. I think it would be more accurate to call it the 4.0 (or 5.0) Phenomenon. The term “*revolution*” also needs a bit of clarification. It is predominantly a revolution in thinking, in the way we look at these principles and technologies. Technology-wise, I see it as a natural progression. What is revolutionary is utilizing the results achieved through new technologies to improve the quality of life in a broader context.

Is it possible to say which company or country first came up with the idea of IMS and Industry 4.0 and began to implement them? Who is the pioneer or who has taken IMS to the next level? It seems a little like the time before and after the invention of the steam engine...

I have already hinted at it: in my opinion, all we need is often simply to rearrange things and use them wisely to achieve a revolutionary solution. It is a mistake to think that using sensors, digitalization or information technology is enough to move society forward and improve the quality of life. It is very important to be able to look

at the world and use common sense, the people’s potential and new technologies to achieve that.

You specialize in sustainable production systems. Is it fair to say that an intelligent manufacturing system is inherently sustainable? And if not, what are the differences between the two? And what else could help us achieve sustainability?

For me, the impact on people is always crucial to anything we do. And that’s where the notion of sustainability in production systems has come from. Production systems have changed a lot over the years: from the system depicted in the movie *Modern Times*, where people were more like robots on a production line, to today’s manufacturing systems in which people work in tandem with robots and cobots that are able to perform physically and mentally demanding jobs and interact with humans. One day we may even move on to sustainable ecosystems which are able to create ideal working conditions for employees, but can also meet the needs of the region’s residents. In any case, it is always important to strike a balance between economic, social, and environmental perspectives.

I imagine that IMS are evolving incredibly fast. What are the current trends? How far can development go? What are manufacturing companies using at the moment?

We can safely predict that in the future, intelligent manufacturing systems will develop toward a stronger focus on cooperation between people and machines, and a data-driven production management process in a broader context, i.e. managing the supply and demand chain; a greater degree of automation and robotization, which increases the demands on professions with higher competencies; cyber security within production and supply and demand chains, which means the use of a blockchain approach. We should also strive toward greater sustainability and resilience of production systems; it is a part of our preparedness for global upheavals. Another aspect of this is innovation in materials and new technologies.

Would it be fair to say that the development of IMS is going faster than their implementation, or is it the other way around, with companies having dreamt up an optimal production process and now trying to get closer to it technically/technologically?

In my opinion, businesses are trying to implement new technologies and approaches that would move their company forward and give it a competitive edge. The possible bottleneck I see is the people's (in)ability to adapt to new things, new approaches, new understanding of rapid changes in society. We live in a time of huge, turbulent change, a time of enormous technological, societal and value changes that have started in the past decade and will continue. Businesses are part of a global ecosystem and face global challenges, but without local resources they may not be able to successfully manage them. This is the challenge that businesses must meet. As Professor Zelený says, "Think globally, act locally."

The domain of IMS specialization is related to the concepts of intelligent diagnostics and maintenance, intelligent manufacturing control, embedded intelligence, big data, neural networks and machine learning; models, control, trends, predictions using AI; sensors

or sensor control technologies. Most of these concepts are probably obvious, but I'm still wondering how embedded intelligence differs from traditional "intelligence"?

That's a very interesting question. We could perhaps say that embedded intelligence is more accurate; it can work with a very broad base of data that it can evaluate and then learn more quickly and efficiently; and makes fewer mistakes. Perhaps we could name other attributes that move society forward. But we must not forget it was the people's emotions, and perhaps even their mistakes, that have, ironically, led to new discoveries and inventions that have moved humanity forward. I would say that will be the combination – or rather, a rational, sensible combination – of artificial intelligence and human common sense that will move us forward.

Am I right to understand that IMS are specifically designed to save time and staffing costs – which is good because employees willing to work in manufacturing are hard to find, and to increase production capacity? Have I missed anything?

This is a very interesting question, but I don't think it's primarily about reducing employee numbers. In my opinion, the deployment of manufacturing systems with elements of artificial intelligence, machine learning etc. will not primarily reduce the number of employees in companies, but will change their structure. Entirely new professions will be created. The number of manufacturing operators will go down, for example, but professions like maintenance workers, industrial engineers, process specialists, human resources specialists, and many others will become increasingly important.

Could you tell us more about the implementation of modern technologies related to the 4.0 phenomenon in education?

Education is absolutely central to the 4.0 phenomenon, because the generation of today's students will be the generation that will direct our society in the future and into the future. I have to admit that it is very difficult to change the content and especially the form of schooling on the fly; it takes knowledge, ability, foresight, and above

all courage to transform the entire Czech education system, at all levels. It is and will be necessary to utilize new technologies and new ideas and approaches to create brand new curricula, teaching methods, interdisciplinary approaches and, most importantly, to adapt education to the radical reshaping the world is currently going through. New professions are going to spring up that do not yet exist, and the education system must be prepared for this. Combining personal talents with new technologies and reflecting on the future state of society is essential for the success of such transformation. I may have gone off topic, but I simply wanted to say that technology will allow us to answer the question of HOW to do things; but it is much more important to ask WHAT to do and WHERE things are going.

As part of your professional work focusing on IMS, you must work with companies that use these systems, to make sure that your conclusions are relevant and as up to date as possible. Is there anything you could tell us about that?

This question has two levels. The first level is professional and educational. I see myself as a mentor, educator and teacher, and it is very important for me to have a role in educating the new generation in society, which is what I have been trying to do during my many years at the University of West Bohemia in Pilsen. My work takes various forms: teaching; supervising bachelor, master and dissertation theses; participating in research and development projects and being involved in their practical application; working as a visiting professor at various universities (especially in Poland); and finally, actively influencing the form and content of university education as a dean (now emeritus) and vice-dean. All of this is closely related to the second level, which I could call a "developmental" role within the innovation ecosystem, one that involves collaboration and networking. I consider this just as important as my role as an expert. Establishing the spirit of cooperation, trust, and respect is a necessary condition for professional collaboration to emerge and, more importantly, to develop and continue.

Is it true that certain industries cannot function without IMS today?

I'm afraid that this is true for all industries. Obviously, the extent to which individual industries use the 4.0 phenomenon is different; for some companies, 4.0 is a crucial element, and their focus is on developing new technologies. However, there are still many fields where human understanding, solidarity, kindness and empathy are far more crucial.

Where do you think society will be in 50 years?

There is certainly no easy answer to this, but I will try to outline it on two levels.

The first is the technological level, where I believe that technologies such as artificial intelligence and robotics will dominate everyday life, both in the home and in industry, commerce, healthcare, public administration processes, and government. Further, quantum computers could be routinely used to solve problems that are too complex for current computers, which

would have significant implications for science, medicine, finance, and cryptography. The products of bioengineering and genetics will most likely be used in nutrition and medicine. We expect further advances in the development of renewable energy sources, and our main energy base could include fusion or more advanced forms of solar and wind power. The efficient and widespread use of these sources could help to address the challenges of climate change.


The second level will be the human perspective, with demographic changes being the main issue. The aging of the population in developed countries and population growth in developing regions will affect the global economy, migration trends and social policies. There will certainly be major changes in the job market, both in the amount of work and its content: new professions will emerge, which will have an impact on the education system that will need to prepare people for these professions. The increased use of artificial intelligence

will result in ethical and legal regulations and frameworks for its use.

The most important issues will concern technology and the human perspective. I think it's fantastic that we are able to both control and create technology. Technology can help save lives, prevent tragedies, and improve quality of life. But we must not forget one fundamental thing: technologies are created to serve human beings. No technology can replace human contact, equitable treatment, bravery in values, moderation in action, discretion and wisdom to make decisions at the right moment, faith in finding the good in every person, hope for a better future, and the courage to make a difference. We often claim to be able to keep up with technological trends or even determine them; we can train new experts and we have the best technological equipment at our fingertips; but what we often lack is the courage to go and do something, to ask questions, to seek answers. And this will be the most important thing for any future developments. ●



A Guide to Creating Visual Identities



Every year, the Smart Accelerator of the Pilsen Region III team organizes regular meetings of communication and marketing specialists who are part of the regional innovation ecosystem. They always try to introduce a topic that gives everyone a push forward. After previous meetings, which were dedicated to science communication, branding or social networks, the March meeting focused on visual identity. The speaker was graphic designer *Michael Dolejš*, collaborator of the renowned Najbrt studio and the author of this article.

What is the difference between a logo and a visual identity, how to communicate with customers in today's world; how to write an assignment properly; who to approach and what to look out for: These are all questions you should ask yourselves when you're in charge of communication on behalf of a company or brand, and feel like it needs a little push or a downright overhaul. And this is exactly what I have briefly tried to outline following my invitation to the Smart Accelerator Pilsen Region event.

Times are changing, and in this day and age the various modes of communication are much more interconnected than they used to be. However, many companies are only now beginning to realize that just having a logo is not enough and that a comprehensive line of communication can work wonders. But what's the difference between a logo and a visual identity, and how do you know whether you have one? Let's break it all down at least a little bit and gain a little insight into the whole issue.

Let's start with the logo. This is generally a sign, symbol or typographic solution that visually represents a company's activities and line of business. It can be an instantly recognizable emblem, such as those of the world's best-known companies like Coca-Cola, Apple, or Adidas. More often, however, a logo is only one part of a more complex vision or set of rules that a company tries to apply consistently across all lines of communication – and these rules form what we call a visual identity. Obviously, visual identity and its perception is constantly evolving and must respond to all sorts of market and technology changes. Some beautiful early examples from history include the identities developed for the Olympic Games, where the visual styles for 1968 Mexico City or 1972 Munich games show how a very simple principle can be effectively used to visually underpin the look of an event of such a magnitude. We could, however, go even further back and look at the visual styles that designer Paul Rand created for companies such as IBM, UPS, or NEXT. Obviously, it would be ideal for a company to become so huge that all you need is a logo to be instantly recognizable. As seen even with the largest companies, however, a logo alone is no longer enough, and companies make a lot of effort to unify all of their campaigns and brand messaging into a single identity. Once such a large company changes visually, the changes affect all forms of its outward presentation, whether online or in retail stores. Of course, having a visual identity doesn't just necessarily mean what a company or business looks like, but also how it presents itself to customers, how it communicates online and how it perceives itself. All of this requires a kind of an overarching visual, and without a good visual foundation, even a well-defined strategy can feel very different than intended.

You may now be asking whether it is really such a big deal that your company does not have a whole visual identity set up, but only has a logo? I'm sure you would all like to be in the position of Coca-Cola, which has done nothing for decades but put its logo on its products in various configurations. Unfortunately, the truth is that there are very few companies that are in this position. The logo as such is still important, but when communicating with potential customers it is good to rely on other recognizable pillars of the brand. Ideally, a company should have more than one such pillar, to prevent

the possibility of some other company, even in a different industry, using something similar. This is an issue that today's designers are facing pretty much every day. Apart from the logo, such pillars can include such elements as a color scheme, fonts, pictograms, illustrations, animations or copywriting; but with the advent of artificial intelligence, they can also be specific prompts or their further use. A nice example of a recent comprehensive rebranding is the brand refresh of Burger King by Jones Knowles Ritchie, where the above-mentioned pillars were used to unify and revitalize the franchise's communication and successfully return to the original 1969 logo, outperforming other fast-food chains that now look outdated compared to this.

This brings me to my next point, which is the need to take care of your communication and constantly try to evolve and improve it. Visual identities and design in general, just like fashion or anything else, are subject to trends and can become outdated. And just like other industries, design and overall presentation is influenced by what those around you are doing, because the perception of what looks fresh and contemporary is constantly shifting. Some trends are driven by technological changes that determine where to focus our communication effort, like the current shift of advertising away from more traditional formats like TV ads to social media; but some are driven purely by the fact that your competitors have decided to make a significant change, as it happened with Burger King. We could say that the latest "fad" is a trend toward simplification, particularly in response to greater demands for a comprehensive presentation on various digital platforms where the logo only gets a little bit of space in the avatar. Burger King's approach to simplifying its logo and communication is therefore not unique. Companies like Starbucks, Warner Brothers and Dunkin' Donuts have simplified their logos to fit these new criteria. This is very aptly illustrated in a very famous post circulating on social media about how today's high-fashion brands like Burberry, Balenciaga and Yves Saint Laurent all look the same, which is, incidentally, one of the trends that companies are starting to turn away from.

But let's get down to actual practice and try to outline how to write an assignment brief if you are already anticipating such a change. Speaking on behalf of all designers, I can assure you that a properly written brief is pretty much the most important thing we want from a client and very often it can determine how the job will turn out. How to do it? First, start with a clearly defined objective and a resulting analysis: provide all the relevant information about where your business is right now, whether based on your own knowledge or as the result of a survey you have had done. The client should focus on conveying all the relevant information in a way that will clarify all issues to people who may not be familiar with the subject matter, regardless of whether it is someone who has some experience in a similar field or is solving a similar problem in the sector for the first time. You, as a client, will always know more about the problems you are facing than the graphic designer you have hired for the task. Unlike you, however, the designer can look at your problem from a distance, which may make it easier to see the way forward. Our common goal is to come up with a solution that will

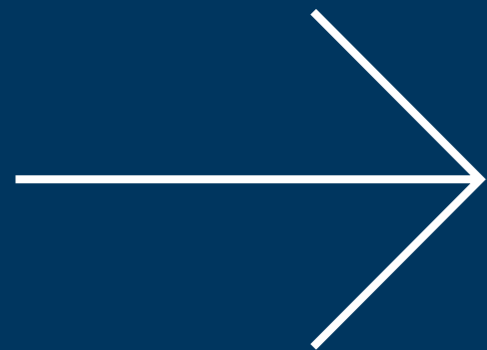
move you forward and help set up the rules to help you in your business, because that's what it's all about. And if it also looks great, all the better.

What should the assignment brief include? In general, there are two instances in which a brief is necessary, and each requires a slightly different approach. The first instance is the more common one: the need to redesign the current way of communication in a company that has been in the market for some time and has realized that changing how it presents itself could improve its competitiveness and signal to the outside world that it can move with the times. This very often happens on an anniversary or during an acquisition, but of course there can be many reasons. In such a case, you need to describe the current state of communication, be open about why you want the change and whether all of the company's management are on the same page in this regard. You need to write down your goals: where do you want your new identity to get you? It's also important to list the company's recent major projects in which communication is most visible, as well as define who will continue to work with the new brand, whether it's an internal team or some other supplier – web developers or social strategists, for example. The second type of assignment is creating a whole new brand. All of the above still applies, but there is more emphasis on identifying the target audience, choosing the right story to communicate, and so on. It's also a good idea to look at what the competition is doing in your industry and determine what you like or don't like.

When meeting with a graphic designer, don't take the whole company with you; bring just those who will be directly involved and those who will communicate with the agency on a daily basis. Reach out to creatives who you think have the right expertise for the job, ideally have done something like this before and can successfully guide you through the whole process. Only then can you safely proceed to implementation and presenting the results of several months' worth of work to the world. Don't try to rush things; give yourself plenty of time and don't be afraid to make bold changes. I wish you the best of luck! ●



Michael Dolejš is a graphic designer who has been working at Studio Najbrt since 2017. He handles most of the digital content, such as websites and mobile apps, but he is also interested in the general overlap between digital design, identities, and communication. Michael Dolejš has worked for STRV, Cleevio and Ableton and has created visual identities for Footshop and SiteOne in Studio Najbrt.



GetSmart!

The Pilsen region today is an attractive place for all those who want to implement a project, establish a start-up or develop a company, as well as for large employers, including those based abroad. It is only thanks to these courageous individuals, teams and companies that the Pilsen Region can proudly call itself an innovative region. It is precisely such a healthy, progressive environment with high sectoral diversity and a focus on activities with high added value that benefits everyone. It is this environment that forms what we call the innovation ecosystem of the Pilsen Region.

If all depends on talents and companies, what is the role of the Pilsen Region as a self-governing body? Its task is primarily moderating the dialogue between the various actors, creating opportunities and background for growth and cooperation, and setting up unified communication. Many experiences from abroad show that this is the right role to play.

The ongoing Smart Accelerator project helps to strategically define the role of the Pilsen Region in the development of the innovation ecosystem. Its activities should be gradually taken over and further developed by the Regional Innovation Centre of the Pilsen Region, which is one of the important issues that are currently being addressed.

Marketing is one of the aspects of collaboration that is already underway within the innovation ecosystem. Over the past few years, a collaborative working group has been established consisting of representatives of educational and research institutions, as well as representatives of municipalities and, above all, companies. The group holds regular meetups which include lectures by experts on communication topics, organizes visits to the members' premises and workplaces, and creates promotional materials.

All of these activities are presented under the GetSmart marketing brand. This brand appears in the title of this magazine, in the header of our newsletter, on our website, or on promotional items and at our events. Its only purpose is to promote the Pilsen region and draw attention to it. ●

Jáchym Klimko

Marketing strategist, author of the GetSmart brand

Company Based in Pilsen Region Heading to Space

Research, development and innovation drive the development of the Pilsen Region and have made it one of the most advanced and productive regions in Czechia. The fact that innovation is not just an empty word, but the the basis of the region's identity, is amply proven by the company ATC Space, which manufactures components for the Ariane 6 launcher.

Essential components for the new European Ariane 6 launch vehicle are being manufactured in the industrial zone near Klatovy. The European Space Agency's flagship launcher is currently undergoing final tests and its first launch will hopefully take place in early July. Several of the rocket's components come from the ATC Space production plant in Klatovy, specifically the aluminum parts for the launcher's auxiliary boosters. While preparations for the launch are currently being finalized, the Klatovy-based company is already working on production modifications for the second generation of the launcher. Thanks to ATC Space, there will be a Czech flag on every Ariane 6 launcher.

"Our company is involved in the manufacture and assembly of two critical components for Ariane 6," says the company's CEO Tomáš Kroták. *"These are the so-called Forward Skirt and Rear Skirt."* Simply put, these are the cylinders that make up the body of the solid propellant auxiliary boosters. The Rear Skirt, for example, refers to the booster's circular base. This component transmits the force and relative weight of the entire launch vehicle during take-off, which requires great structural strength and durability.

The company carries out the final assembly of these components by riveting, i.e. joining the individual aluminum parts into a finished unit following precisely defined working steps. Workers are assisted by a 6-axis PowerRACe robot with an automated positioning system. The robot drills the holes into which the workers manually insert the joining elements. ATC Space also produces the individual aluminum parts. These are waterjet-cut and then machined using precision CNC milling machines.

The company has become an indispensable link in the new launch vehicle development chain, providing ESA with valuable experience. *"We have come a long way. We had already been involved in the assembly of some of the components for the Ariane 5 rocket,"* explains Tomáš Kroták, pointing to the company's many years of experience. *"When building the new plant for the Ariane 6 launcher parts, ESA appreciated our experience in designing the factory and its equipment, as well as our ability to stick to the construction schedule. Many of the elements in our production are already part of our know-how and we have the full confidence of the*

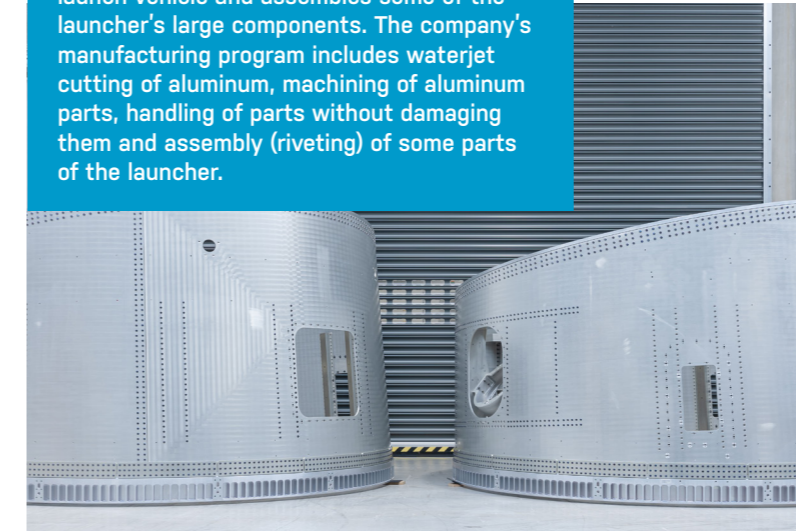
European space industry." Among the innovations ATC Space has at its disposal are vacuum clamping jigs for handling precision and delicate aluminum parts, which prevent damage to such precision workpieces.

The company is currently preparing for the manufacture of improved components for the second generation of the launcher. With all the parts for the planned first-generation Ariane 6 flights already completed, the company is adapting production for the future version of the launcher. ●



ATC Space

ATC Space is a subsidiary of Aerotech Peissenberg, located at Schiffauerova 940 in Klatovy. Visitors to the company's premises will be left with no doubt as to what is produced there: the logo on the gate clearly refers to the Ariane 6 rocket. The company has been awarded the ISO 9100 certification, which is a guarantee of both quality production and excellent management in the aerospace industry. ATC Space manufactures aluminum parts for the European Space Agency's Ariane 6 launch vehicle and assembles some of the launcher's large components. The company's manufacturing program includes waterjet cutting of aluminum, machining of aluminum parts, handling of parts without damaging them and assembly (riveting) of some parts of the launcher.



The company builds on the long tradition of engineering industry in the town of Klatovy, which began in 1854 with the establishment of the first engineering company. The direct predecessor of the current company is Aerotech Czech, established in 2011 after the restructuring of the original company Drost CZ. Aerotech Czech had already been involved in the space industry when it secured orders for the production of some components for the Ariane 5 launcher.

The Ariane 5 launcher only had a few remaining flights scheduled at that time, and Europe was slowly preparing for its successor, the Ariane 6 launch vehicle. The parent company Aerotech Peissenberg took advantage of this situation and managed to obtain a commission and support for the production of aluminum parts and the assembly of some parts for the new launcher. Thanks to the high quality of the components manufactured for the previous model, ESA chose to award the company the new contract as well.

In 2016, preparation and design work began on the project for a new production plant, located in the Klatovy industrial zone. From the beginning, the plant was designed specifically for the production of parts for the aerospace industry. The company designed the production process for the new plant, as well as the building itself and the machinery, and successfully passed the subsequent evaluation review conducted by the European Space Agency. This took into consideration not only the construction of the production plant and the production itself, but also the achievable timetable and the financial limits allocated to this stage of the project. The company met all the requirements without any problems. The plant was built in 2017 and the selection process took place in 2018 and 2019. In June 2019, Aerotech Czech established ATC Space as a separate subsidiary with a clearly defined production program focused on the Ariane 6 project.

Another important milestone is the gradual transition from the production of parts of the current Ariane 6 forward booster skirt to the new design, which is currently underway. In the process of transitioning to the improved parts, the Klatovy-based company will be the one to define the production specifications and processes. It has thus become an indispensable link in the new launch vehicle development chain, providing valuable experience for streamlining and improving quality in manufacturing the assigned parts. This process is all the more challenging because the transition to the new design took place well before the launcher's first deployment. Long-term production planning is another valuable know-how that ATC Space provides.

The company cooperates with selected scientific and educational institutions. Experts from the Faculty of Mechanical Engineering at the University of West Bohemia in Pilsen are involved in optimizing the machining of aluminum parts. Particularly beneficial was the cooperation with the Czech Aerospace Research Center in Prague (VZLÚ), which conducted a non-destructive test of the Rear Skirt. This involved applying pressure to a product that plays a vital role in the structural integrity of the launcher's auxiliary booster. ●

Participants of the Incubation Program — Spring 2024

This year 16 promising startups applied for the spring round of the incubation program of the BIC Pilsen Business and Innovation Center. In March, the board of the incubation program selected seven of them to offer support and a financial subsidy from the Pilsen Region of up to CZK 500,000 for the purchase of services.

Which business plans have been selected? Čočkýna focuses on healthy lentil-based snacks. Home4Future is a startup developing new building materials. InstaCover is developing apps against insurance fraud. Veriteus Technology is a lie detection app. A group of young game developers are behind the Bell Hat Games project for children with ADHD. VR School is developing a successful virtual reality experience for schools. What challenges are the companies' founders solving with BIC Pilsen consultants and what do they expect to achieve during the incubation?

This year, the program newly differentiates whether a company is in the start-up phase (it has an idea, a product in development, but has not yet generated any sales, and the founders are incubating alongside their work or studies) or in the growth phase (a finished product verified by the market, with full team capacity and a goal to grow internationally). The incubation team, which has also grown in numbers, takes care of the companies, helping them to validate and finalize their business plan, connecting them to relevant partners and experts and bringing them opportunities from the European innovation ecosystem.

● Čočkýna: Healthy Snacks

Čočkýna s.r.o. specializes in the production and distribution of crunchy legumes full of protein and targets a wide range of customers, from vegans to athletes. Its products are characterized by the simplicity of ingredients: they contain only lentils, coconut oil, and sea salt. This way, Čočkýna guarantees not only a high protein content, but also a 100% vegan, gluten-free formula. The company offers different flavors such as sea salt, garlic and chili, and a package is equivalent to 300 grams of cooked lentils, which is a sufficient portion for a filling lunch or dinner. As a young brand, Čočkýna aims to encourage people to eat healthier and promote a healthy lifestyle. What does Čočkýna expect from participating in the incubation program? Support in growing its business, particularly in expanding market penetration and developing new products. The company also plans to expand the team with talented individuals in various roles, including organizing events and tastings, maintaining relationships with business partners and creating marketing materials. By participating in the incubation program, Čočkýna will gain access to mentorship, a network of contacts and other resources to help it achieve its goals.

● Home4Future: New Building Materials

For several years Jozefína Odvárková has been designing and developing new building materials that are simple and affordable yet ensure high quality and functionality of the resulting structure. Jozefína Odvárková first applied for the incubation program in autumn 2023 with the Yotegon material for monolithic buildings. Although she was unsuccessful, she did not give up on her dream and applied for the spring incubation with Perwin – a fire-resistant material that protects combustible structures (such as wooden roof structures) from fire even when soot burns in the chimney. Odvárková's vision and goal for the incubation is to build a functioning manufacturing company that sells new building materials and elements to builders, both companies and individuals. The company's incubation plan will include material testing or certification as well as building sales and marketing channels.

Apart from chimney penetrations, Perwin has a range of other applications, so much of the consulting capacity will be used to evaluate new market opportunities and set up all the processes needed to run a manufacturing business.

● InstaCover: Application against Insurance Fraud

The Pilsen-based startup InstaCover operates in the field of insurtech. Simply put, it brings innovations to the insurance industry using artificial intelligence. InstaCover is a purely web-based application. When arranging their liability insurance, potential clients receive a link to the app directly on their mobile phone. The app guides the client through the entire process of taking photos of their car, so as to provide a set of high quality and complete photos. The app can also extract text data, such as the license plate number, VIN code, data from the vehicle registration certificate, etc. Thanks to the application, the insurance company will receive complete documentation, which is important not only for setting up an insurance contract, but especially in the event of an insurance claim. With the help of AI, InstaCover helps to prevent insurance fraud. After about 2.5 years of operation, when it managed to acquire 53% of the Czech market in the field of liability insurance, InstaCover has hit its limits. Therefore, the team of young innovators decided to join the incubation program to try to break into foreign markets. In particular, they want to focus on the development of their business skills, which go hand in hand with setting up a marketing strategy for expansion.

● Bell Hat Games: ADHD Therapy

Bell Hat Games is a project launched by a group of game developers led by Jan Purkart. The small independent Czech game studio, which develops short arcade and story-based video games, wants to prove that games can help. "Our mobile game *Celestial Expedition* helps children with ADHD. It helps them to learn to focus and stay calm by integrating innovative EEG technologies," Purkart explains. So far, it seems that the game will even be able to delay the necessity of medicating hyperactive children or reduce the medication dosage. However, it will also help children who do not have

not been diagnosed with ADHD but still have difficulties focusing in a distracting school environment. The game is a safe tool for parents to help their children improve their concentration and achieve better results in school. "Our goal in incubation is to gain initial financial support and create a clearly defined plan for successful business development. We believe that with the help of the investment raised and thanks to the work of our team, we will be able to bring this game to the children who need it."

● MarbleMat: a New Form of Food Supplements and Pharmaceuticals

A large proportion of the active substances on the market approved for pharmaceutical use are poorly water soluble, which results in their low bioavailability. The technology developed by Ondřej Rychetský, who is a member of Professor František Štěpánek's research group at the University of Chemistry and Technology in Prague (VSCHT) and is a PhD graduate at The PARC Center, focuses on these compounds with an aim to improve their properties. His patented encapsulation technology for the production of Oil Marbles (solid lipid particles) was developed at VSCHT and became one of the university's first spin-offs with established intellectual property. Within a short period of its existence, Rychetský's company MarbleMat has already been awarded the TA CR GAMA 2 project and placed among the top 20 start-ups in the EIT Health InnoStars Award. It now looks to build an R&D and manufacturing company that will continue to develop and globally market premium lipid formulations for the pharmaceutical and food industries. In the incubation program, the company wants to launch the first version of their dietary supplements and establish strategic partnerships with other dietary supplement manufacturers. In the incubation plan, we can expect services related to participation in international events (trade fairs) or developing the equipment known as Kuličkomat ("Marble Maker") to make it suitable for mass production. Interestingly, the company participates both in the incubation program supported by the city of Pilsen and the Pilsen Region, as well as in the Technological Incubation, which

will help the company to develop the final version of its product (relevant combinations of active ingredients).

● Veriteus Technology: A Lie Detection App

The average person's ability to spot a lie is usually only slightly better than if they simply flipped a coin. Parents are just as unreliable to spot lies in their children as are professional crime investigators in their suspects. The founders of Veriteus Technology have attempted to address this issue by developing a new tool that aids in lie detection using a specialized application running in a web browser.

Such an app would have a wide range of applications, from verifying the truthfulness of claims made when reporting insurance events to, for example, an HR assistant who will assist in interviews by flagging potentially false or suspicious statements. The application is currently learning an algorithm that will detect a lie in an online questionnaire for the project's first use case – identity verification. Volunteers interested in helping to improve the model's reliability can apply now (simply email grmela@veriteus.tech to let us know of your interest). In the second phase, scheduled to start this fall, the team will focus on improving automation, the user interface, and especially the use of video for more accurate results.

The incubation program should help the Veriteus team to resolve legal and business issues, implement the go-to-market strategy, set up pricing and establish strategic



partnerships that will help the team develop a truly functional tool that addresses the needs of real customers.

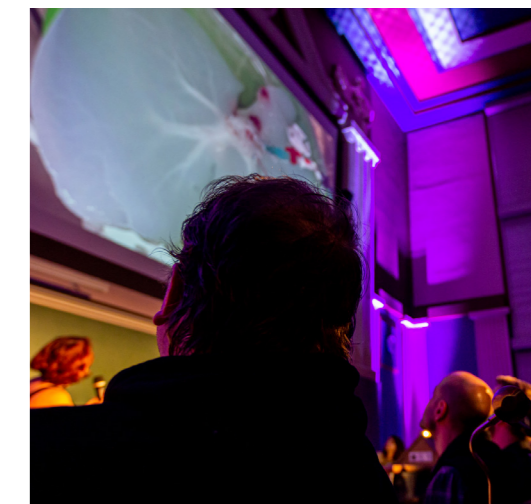
● VR School: Virtual Reality for Schools

"Virtual reality in the classroom is a great education tool. It allows students to experience situations that would be dangerous, expensive or unfeasible in reality – trips into space, chemical experiments, or historical events. There are no limits to the possibilities of using VR for schools. It has a wide range of applications in elementary schools, secondary schools and universities. Virtual reality is interesting and engaging and is capable of conveying the desired information through direct experience, even to a group of people at the same time. Therefore, it is an ideal supplement to frontal teaching," says Marek Bárďy, the founder of VR School. The aim of the company, which was founded in February this year, is to create a platform for effective education that meets the current and future requirements of the EU and the children themselves. Through the use of VR, the company wants to help children not only learn the material, but also understand it. "The first VR experiments for teaching chemistry begun as early as 2021 and have been tested in schools in Pilsen. We have now managed to create both the hardware and software required," Bárďy adds. As part of the incubation, the company wants to grow, take over the rest of the Czech market and start expanding into the EU market. To do this, it will need to understand the differences in processes and needs of foreign schools and teachers, adjust their business model and set up and implement a new marketing strategy.

PechaKucha Night Plzeň Science Edition:

Inspiring Evenings Dedicated to Science

Since 2017, the Smart Accelerator project of the Pilsen Region has organized a number of activities that help to develop the so-called innovation ecosystem and create opportunities for representatives from various educational and research institutions, local governments, companies and startups to meet, network and inspire, thus moving the entire region forward. One of the events where inspiring personalities across different fields, institutions and companies can meet is the PechaKucha Night Pilsen Science Edition. The first of these events was held in November 2022 at the Pavlov Pavilion, and the second took place at the TechTower Science and Technology Park in October 2023. We would like to cordially invite you to the third edition, which will take place on 11 October 2024.



PechaKucha Night Science Edition I
Friday 11 November 2022, Pavlovův pavilon, Plzeň

*Dušan Majer, Vladimíra Moulisová, Marek Görgeš, Tomáš Cholinský,
Milena Králíčková, Milan Legát, František Mach, Lucie Vištejnová,
Jiří Hlaváček, Daniel Georgiev*



PechaKucha Night Science Edition II
Friday 20 October 2023, TechTower, Plzeň

*Vladislav Lang, Ondřej Vyhnal, Jiří Moláček, Václav Kotora, Karel Ježek,
Tadeáš Kapic, Jakub Reiter, Pavel König, Jan Korabečný, Milan Edl*



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