18. september 2025 | 18 September 2025
Maribor, Slovenia



INFORMACIJSKA DRUŽBA

INFORMATION SOCIETY

Digitalna vključenost v informacijski družbi

Digital Inclusion in Information Society

Uredniki | Editors:
Boštjan Šumak, Maja Pušnik, Saša Grašič

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PREDGOVOR MULTIKONFERENCI INFORMACIJSKA DRUŽBA 2025

28. mednarodna multikonferenca *Informacijska družba* se odvija v času izjemne rasti umetne inteligence, njenih aplikacij in vplivov na človeštvo. Vsako leto vstopamo v novo dobo, v kateri generativna umetna inteligenca ter drugi inovativni pristopi oblikujejo poti k superinteligenci in singularnosti, ki bosta krojili prihodnost človeške civilizacije. Naša konferenca je tako hkrati tradicionalna znanstvena in akademsko odprta, pa tudi inkubator novih, pogumnih idej in pogledov.

Letošnja konferenca poleg umetne inteligence vključuje tudi razprave o perečih temah današnjega časa: ohranjanje okolja, demografski izzivi, zdravstvo in preobrazba družbenih struktur. Razvoj UI ponuja rešitve za številne sodobne izzive, kar poudarja pomen sodelovanja med raziskovalci, strokovnjaki in odločevalci pri oblikovanju trajnostnih strategij. Zavedamo se, da živimo v obdobju velikih sprememb, kjer je ključno, da z inovativnimi pristopi in poglobljenim znanjem ustvarimo informacijsko družbo, ki bo varna, vključujoča in trajnostna.

V okviru multikonference smo letos združili dvanajst vsebinsko raznolikih srečanj, ki odražajo širino in globino informacijskih ved: od umetne inteligence v zdravstvu, demografskih in družinskih analiz, digitalne preobrazbe zdravstvene nege ter digitalne vključenosti v informacijski družbi, do raziskav na področju kognitivne znanosti, zdrave dolgoživosti ter vzgoje in izobraževanja v informacijski družbi. Pridružujejo se konference o legendah računalništva in informatike, prenosu tehnologij, mitih in resnicah o varovanju okolja, odkrivanju znanja in podatkovnih skladiščih ter seveda Slovenska konferenca o umetni inteligenci.

Poleg referatov bodo okrogle mize in delavnice omogočile poglobljeno izmenjavo mnenj, ki bo pomembno prispevala k oblikovanju prihodnje informacijske družbe. »Legende računalništva in informatike« predstavljajo domači »Hall of Fame« za izjemne posameznike s tega področja. Še naprej bomo spodbujali raziskovanje in razvoj, odličnost in sodelovanje; razširjeni referati bodo objavljeni v reviji *Informatica*, s podporo dolgoletne tradicije in v sodelovanju z akademskimi institucijami ter strokovnimi združenji, kot so ACM Slovenija, SLAIS, Slovensko društvo Informatika in Inženirska akademija Slovenije.

Vsako leto izberemo najbolj izstopajoče dosežke. Letos je nagrado *Michie-Turing* za izjemen življenjski prispevek k razvoju in promociji informacijske družbe prejel **Niko Schlamberger**, priznanje za raziskovalni dosežek leta pa **Tome Eftimov**. »Informacijsko limono« za najmanj primerno informacijsko tematiko je prejela odsotnost obveznega pouka računalništva v osnovnih šolah. »Informacijsko jagodo« za najboljši sistem ali storitev v letih 2024/2025 pa so prejeli Marko Robnik Šikonja, Domen Vreš in Simon Krek s skupino za slovenski veliki jezikovni model GAMS. Iskrene čestitke vsem nagrajencem!

Naša vizija ostaja jasna: prepoznati, izkoristiti in oblikovati priložnosti, ki jih prinaša digitalna preobrazba, ter ustvariti informacijsko družbo, ki koristi vsem njenim članom. Vsem sodelujočim se zahvaljujemo za njihov prispevek — veseli nas, da bomo skupaj oblikovali prihodnje dosežke, ki jih bo soustvarjala ta konferenca.

Mojca Ciglarič, predsednica programskega odbora
Matjaž Gams, predsednik organizacijskega odbora

FOREWORD TO THE MULTICONFERENCE INFORMATION SOCIETY 2025

The 28th International Multiconference on the Information Society takes place at a time of remarkable growth in artificial intelligence, its applications, and its impact on humanity. Each year we enter a new era in which generative AI and other innovative approaches shape the path toward superintelligence and singularity — phenomena that will shape the future of human civilization. The conference is both a traditional scientific forum and an academically open incubator for new, bold ideas and perspectives.

In addition to artificial intelligence, this year's conference addresses other pressing issues of our time: environmental preservation, demographic challenges, healthcare, and the transformation of social structures. The rapid development of AI offers potential solutions to many of today's challenges and highlights the importance of collaboration among researchers, experts, and policymakers in designing sustainable strategies. We are acutely aware that we live in an era of profound change, where innovative approaches and deep knowledge are essential to creating an information society that is safe, inclusive, and sustainable.

This year's multiconference brings together twelve thematically diverse meetings reflecting the breadth and depth of the information sciences: from artificial intelligence in healthcare, demographic and family studies, and the digital transformation of nursing and digital inclusion, to research in cognitive science, healthy longevity, and education in the information society. Additional conferences include Legends of Computing and Informatics, Technology Transfer, Myths and Truths of Environmental Protection, Knowledge Discovery and Data Warehouses, and, of course, the Slovenian Conference on Artificial Intelligence.

Alongside scientific papers, round tables and workshops will provide opportunities for in-depth exchanges of views, making an important contribution to shaping the future information society. *Legends of Computing and Informatics* serves as a national »Hall of Fame« honoring outstanding individuals in the field. We will continue to promote research and development, excellence, and collaboration. Extended papers will be published in the journal *Informatica*, supported by a long-standing tradition and in cooperation with academic institutions and professional associations such as ACM Slovenia, SLAIS, the Slovenian Society Informatika, and the Slovenian Academy of Engineering.

Each year we recognize the most distinguished achievements. In 2025, the Michie-Turing Award for lifetime contribution to the development and promotion of the information society was awarded to **Niko Schlamberger**, while the Award for Research Achievement of the Year went to **Tome Eftimov**. The »Information Lemon« for the least appropriate information-related topic was awarded to the absence of compulsory computer science education in primary schools. The »Information Strawberry« for the best system or service in 2024/2025 was awarded to Marko Robnik Šikonja, Domen Vreš and Simon Krek together with their team, for developing the Slovenian large language model GAMS. We extend our warmest congratulations to all awardees.

Our vision remains clear: to identify, seize, and shape the opportunities offered by digital transformation, and to create an information society that benefits all its members. We sincerely thank all participants for their contributions and look forward to jointly shaping the future achievements that this conference will help bring about.

Mojca Ciglarič, Chair of the Program Committee
Matjaž Gams, Chair of the Organizing Committee

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PREDGOVOR

Digitalni svet danes ni več spremljevalec našega vsakdana, temveč njegov temeljni okvir. Povezljivost, ki je bila nekoč privilegij, postaja osnovna pravica, brez katere si ne moremo več predstavljati dela, učenja, zdravstva, javnih storitev ali kulturnega življenja. Toda prav ta vseprisotnost tehnologije zahteva novo etiko odgovornosti – razvijati moramo digitalne rešitve, ki ne ustvarjajo novih razlik, temveč zmanjšujejo obstoječe.

Osrednja tematika hibridne delavnice DIGIN 2025 – Digitalna vključenost v informacijski družbi je razgrnila široko paleto pogledov na digitalno inkluzijo. Tudi letošnje leto je delavnica potekala v sodelovanju z evropskim centrom virov o dostopnosti – AccessibleEU. Raziskovali smo organizacijske, institucionalne in tehnološke vidike dostopnosti, predstavili orodja za večjo samostojnost uporabnikov, analizirali uporabniško izkušnjo in dobre prakse uporabe umetne inteligence v izobraževanju. V ospredju so bile zgodbe in potrebe slabovidnih, gluhih, oseb z avtizmom, starejših, mladih z različnimi oblikami oviranosti ter študentov, ki jim slovenščina ni materni jezik. Ravno s tem poudarkom smo pokazali, da digitalna vključenost ni enodimenzionalen pojem, temveč kompleksno področje, ki se dotika jezika, psihologije, infrastrukture, izobraževanja in družbenih odnosov.

Poseben pečat je dogodku dala okrogla miza, na kateri so udeleženci z lastnimi izkušnjami pokazali, kaj pomeni živeti v svetu, ki je lahko hkrati povezan in nedosegljiv. Njihovi glasovi so nas opomnili, da digitalna dostopnost ni zgolj tehnološko vprašanje, temveč predvsem vprašanje človeškega razumevanja, empatije in sodelovanja.

Prispevki v letošnjem zborniku ponujajo dragocen vir idej in znanja, ki lahko navdihnejo vse bralce. Z njihovo pomočjo lažje razumemo, kako tehnologija prispeva k višji kakovosti življenja, večji samostojnosti ter enakovrednemu vključevanju v digitalni svet. Prepričani smo, da s tem dogodkom in skupnimi prizadevanji gradimo bolj odprto, dostopno in človeku prijazno digitalno prihodnost.

DIGIN 2025 je več kot dogodek – je zaveza, da digitalna preobrazba ne bo nikogar pustila ob strani.

FOREWORD

The digital world today is no longer a companion to our everyday lives but their very foundation. Connectivity, once a privilege, has become a basic right – one without which we can no longer imagine work, education, healthcare, public services, or cultural life. Yet this very ubiquity of technology demands a new ethic of responsibility – we must develop digital solutions that do not create new divides but rather reduce existing ones.

The central theme of the hybrid workshop DIGIN 2025 – Digital Inclusion in the Information Society opened a broad spectrum of perspectives on digital inclusion. Once again, the workshop was organized in cooperation with the European Accessible Resources Centre – AccessibleEU. We explored organizational, institutional, and technological aspects of accessibility, presented tools that promote user independence, analyzed user experience, and shared good practices in the use of artificial intelligence in education. The focus was on the stories and needs of people with visual or hearing impairments, individuals on the autism spectrum, older adults, young people with various disabilities, and students whose first language is not Slovene. Through this focus, we demonstrated that digital inclusion is not a one-dimensional concept, but a complex field that encompasses language, psychology, infrastructure, education, and social relations.

A special highlight of the event was the roundtable discussion, where participants shared their personal experiences of what it means to live in a world that can be both connected and out of reach. Their voices reminded us that digital accessibility is not merely a technological issue but above all a matter of human understanding, empathy, and cooperation.

The contributions collected in this year's proceedings offer a valuable source of ideas and knowledge that can inspire all readers. They help us better understand how technology contributes to a higher quality of life, greater independence, and equal participation in the digital world. We are convinced that through this event and our collective efforts, we are building a more open, accessible, and human-centered digital future.

DIGIN 2025 is more than an event – it is a commitment to ensuring that digital transformation leaves no one behind.

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Good Practices of AI Use: Case Studies from Türkiye

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Abstract

This paper presents three AI-supported good practices developed in Türkiye as part of the AI-Enable Erasmus+ project illustrating how artificial intelligence can support inclusive education in higher education. The practices were created during exploration workshops at Istanbul University-Cerrahpaşa with the involvement of academic staff and students. They focus on diverse areas, including academic writing support, inclusive language teaching materials, and accessible video content. The cases demonstrate that low-cost, open-access AI tools can be effectively used in pedagogical contexts to enhance digital creativity and address diverse learner needs. Participants reported increased confidence, engagement, and awareness of inclusive practices. However, challenges such as internet access, language limitations of tools, copyright concerns, and the need for ethical guidance were also noted. Overall, the findings show that the meaningful use of AI in inclusive education depends not only on technology itself but also on pedagogical design, ethical implementation, and institutional support.

Keywords

AI-Enable Project, Artificial Intelligence, Inclusive Education, Good Practices, Higher Education

1 Introduction

The integration of Artificial Intelligence (AI) into higher education offers new opportunities for inclusive, personalized, and student-centered learning. Adaptive learning platforms and intelligent tutoring systems enable students to receive individualized instruction and feedback [1]. Educators can create more flexible and inclusive learning environments that respond to diverse learner needs [2]. While the impact of AI on education remains a subject of ongoing debate, its potential to promote inclusion and improve educational outcomes is increasingly recognized [3].

In this context, the growing use of AI tools such as ChatGPT, Gemini, Napkin, and Canva highlights the importance of shaping education policies that prepare individuals for the future, developing flexible and accessible learning systems, and establishing guidelines for the ethical use of AI [4]. As part of the Erasmus+ supported AI-Enable Project, a framework, guidelines, and good practice examples have been developed to guide AI integration in higher education. This paper presents selected good practices from Türkiye to demonstrate how AI technologies can contribute to inclusive education through concrete, context-sensitive examples.

Inclusive education in higher education requires not only access to digital tools but also pedagogically grounded, ethically responsible, and learner-sensitive practices. However, without addressing challenges such as limited infrastructure and lack of teacher training, these practices cannot be effectively implemented [5]. The AI-Enable Project brought together universities from Slovenia, Spain, Portugal, and Türkiye to identify and document inclusive, AI-supported teaching practices. Through exploration workshops with academic staff, students, and researchers, ten good practices aligned with pedagogical value, scalability, and inclusive AI principles were developed.

This paper focuses on three selected examples from Türkiye, ranging from academic writing support to multimodal material design. These cases illustrate how AI tools can enhance inclusion in Turkish higher education. Grounded in real educational challenges and tested in classroom contexts, the case studies offer insights into the transformative potential of AI when implemented thoughtfully and intentionally.

2 Methodology

This study aims to present good practice examples of inclusive artificial intelligence applications implemented in higher education institutions in Türkiye within the scope of the AI-Enable Project. The three good practices featured in this paper were developed during exploration workshops held at Istanbul University-Cerrahpaşa. These workshops brought together academic staff, undergraduate and graduate students, and researchers to collaboratively develop AI-supported solutions addressing educational challenges related to inclusion.

Each good practice was structured around the following components:

- The identified inclusion challenge
- The AI tool(s) used
- The target student group and level of education

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- The expected or observed outcomes
- Reflections on the strengths and limitations of the tools.

The selected practices were analyzed not only in terms of their technical application but also regarding pedagogical coherence, sensitivity to learner diversity, and ethical awareness. These examples offer insights into how inclusive, AI-supported educational practices can be meaningfully and sustainably integrated into higher education institutions in Türkiye.

These workshops were supported by Istanbul University-Cerrahpaşa through access to computer labs, stable internet infrastructure, and institutional encouragement of AI experimentation. While no formal training program was in place, instructors provided informal peer support and curated prompts. These grassroots support mechanisms were essential in facilitating meaningful experimentation with AI tools.

3 CASE STUDIES FROM TÜRKİYE

3.1 AI-Supported Inclusivity in Academic Writing

This practice implemented at Istanbul University-Cerrahpaşa, aimed to enhance equity in academic writing processes. In exploration workshops attended by graduate and doctoral students as well as academic staff, tools such as ChatGPT, Gemini, Scispace, Perplexity, and Consensus AI were used to support academic productivity. Participants utilized these tools for literature review, theoretical framework development, qualitative data analysis, and academic writing.

The initiative particularly aimed to alleviate barriers experienced by non-native English-speaking researchers, including language difficulties, time constraints, and limited access to academic resources. Through prepared prompt templates and sample contents, participants learned how to use AI tools ethically. At the end of the process, participants reported feeling more confident and productive; however, they also highlighted the need for more guidance on ethical use and sustainable access to AI tools.

3.2 Using AI Tools to Create Inclusive Worksheets and Audio Materials for Pre-Service Language Teachers

This good practice aimed to support English language teacher candidates in producing inclusive instructional materials for students with diverse learning styles. Participants created reading and grammar exercises aligned with CEFR levels using ChatGPT and Gemini and generated natural-sounding audio content with text-to-speech (TTS) tools such as Murf.ai, Play.ht, and ElevenLabs. Canva and Piktochart were actively used in the design of visual materials.

The resulting materials were diversified to address auditory, visual, and kinesthetic learning preferences. Accessibility was enhanced by providing audio content via QR codes. As a result of the practice, the teacher candidates gained valuable skills in using AI tools both creatively and pedagogically. Challenges included dependence on internet connectivity and limited experience in effective prompt engineering.

3.3 Using AI Video Tools to Create Inclusive Language Learning Materials

This practice conducted with pre-service English language teachers, focused on producing diverse and inclusive video content. Participants developed scenarios using ChatGPT and Gemini and transformed them into avatar-supported videos through tools such as Fliki, Pictory, and Synthesia. Audio components were created using Murf.ai and Play.ht, while Canva and Bing Image Creator were used for visual design.

The practice aimed to create accessible learning environments for students with learning differences such as dyslexia, attention deficit, and hearing impairment. Participants took active roles in planning, producing, and evaluating content through group work, which helped them enhance both their digital creativity and awareness of inclusivity. Feedback indicated that the activity strongly supported motivation and creativity but also revealed a need for further guidance on copyright issues and content verification.

4 CONCLUSION

The three good practices presented in this paper demonstrate how artificial intelligence can be meaningfully and creatively utilized to support inclusive education in higher education in Türkiye. Common features across the cases include the pedagogical integration of low-cost, open-access tools; the enhancement of digital creativity among both teachers and students; and a systematic sensitivity to diverse learner profiles.

These case studies highlight that AI tools are not merely technical solutions but pedagogical instruments that invite educators to rethink teaching and learning processes. Active participation by students and instructors enabled shared responsibility, critical reflection, and greater teacher autonomy. In this context, the AI-supported creation of learning materials not only enhanced accessibility but also increased learner engagement, motivation, and participation.

At the same time, the implementations revealed several challenges. Issues such as reliance on stable internet access, the linguistic limitations of AI tools, concerns over copyright and content accuracy underscored the need for institutional measures to ensure ethical and sustainable integration. Moreover, it became evident that teachers require more structured guidance, exemplary practices, and professional development opportunities to use AI effectively within pedagogical settings.

In conclusion, this study illustrates both the potential and the critical considerations of using AI to foster inclusive education, through three concrete examples from Türkiye. These practices may inspire not only local efforts but also broader initiatives across higher education contexts in Europe. These practices, while developed in a local university context, offer a scalable framework that can be adapted to different higher education institutions. Their emphasis on low-cost tools, participatory design, and contextual relevance makes them suitable for replication across diverse educational settings. For AI to play a meaningful role in inclusive education, it must be embedded in pedagogically sound, ethically grounded, and participatory approaches—beyond mere technological availability.

Further research is needed to evaluate the long-term impact of AI-supported inclusive practices on student outcomes.

Comparative studies across different universities or cultural contexts may offer additional insights into best practices for scaling and adapting these approaches. Developing institution-wide policies that ensure ethical use and sustainable infrastructure will also be essential in the coming years.

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