



Slovak Quantum
Communication
Infrastructure



D 4.3

Outreach activities report for skQCI project



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Table of Contents

OUTREACH ACTIVITIES REPORT FOR SKQCI PROJECT.....	1
DOCUMENT CONTROL SHEET	2
VERSIONING AND CONTRIBUTION HISTORY	3
DISCLAIMER	3
BACKGROUND: ABOUT SKQCI PROJECT	6
1. INTRODUCTION.....	7
OBJECTIVE	7
2. PUBLIC COMMUNICATION AND POPULARISATION	7
OBJECTIVE	7
2.1 VISUAL IDENTITY AND PROMOTIONAL MATERIALS	8
2.2 PROJECT WEBSITE AND ONLINE PRESENCE.....	9
2.3 NEWS AND PROJECT UPDATES.....	10
2.4 SOCIAL MEDIA COMMUNICATION.....	11
2.5 MEDIA COMMUNICATION	12
2.6 MULTIMEDIA COMMUNICATION.....	13
CONTRIBUTION TO PROJECT OBJECTIVES	14
3. PUBLIC ENGAGEMENT ACTIVITIES.....	14
OBJECTIVE	14
3.1 LARGE PUBLIC EVENTS AND SCIENCE FESTIVALS.....	15
3.3 HIGH-SCHOOLS AND VIRTUAL CLASSROOMS.....	16
3.4 THE QUANTUM EXPERIENCE AND PUBLIC LECTURES	17
3.5 POPULAR SCIENCE ARTICLES	19
4. SCIENTIFIC DISSEMINATION AND KNOWLEDGE EXCHANGE	20
OBJECTIVE.....	20
4.1 SCIENTIFIC CONFERENCES	21

4.2 INVITED TALKS AND LECTURES	21
4.3 SPECIALIZED WORKSHOPS AND MEETINGS.....	21
4.4 SCIENTIFIC PUBLICATIONS.....	22

5. INDUSTRY, STAKEHOLDER AND POLICY ENGAGEMENT 23

OBJECTIVE 23

5.1 INDUSTRY COLLABORATION AND TECHNOLOGY TRANSFER.....	24
5.2 INDUSTRY COLLABORATION AND TECHNOLOGY TRANSFER.....	24
5.3 PUBLIC AUTHORITIES AND POLICY SUPPORT	25
5.4 EUROPEAN COLLABORATION AND STRATEGIC NETWORKING	26

CONTRIBUTION TO PROJECT OBJECTIVES 28

6. INTERNATIONAL VISIBILITY AND NETWORKING 28

OBJECTIVES 28

6.1 KEY CROSS-BORDER COLLABORATIONS AND INDUSTRIAL PARTNERSHIPS.....	28
6.3 CROSS-BORDER MOBILITY AND ACADEMIC EXCHANGES	29

7. IMPACT AND SUSTAINABILITY 30

OBJECTIVE 30

7.1 MEASURABLE COMMUNICATION AND DISSEMINATION IMPACT	30
7.2 HUMAN CAPACITY AND LONG-TERM EDUCATIONAL SUSTAINABILITY	32
7.3 LONG-TERM IMPACT AND COMMERCIAL EXPLOITATION.....	32

CONCLUSION.....33

BACKGROUND: ABOUT SKQCI PROJECT

This project aims to develop a quantum communication infrastructure in Slovakia.

THREE MAIN ACTIVITIES:

The goal is to use the same hardware and technology for implementing various entanglement-based QKD protocols to populate, in this first phase, six nodes across Slovakia (later on another six nodes), thus **creating the backbone of a national quantum network**. The chosen approach will not only meet the criteria of this call for connecting several European cities with QKD links. Still, it will also lay the foundation for the next steps in achieving a quantum internet that goes beyond simple cryptographic tasks, allowing Slovakia to consider other quantum communication protocols in the future.

1. The objective of building this infrastructure within the duration of this project will also be accompanied by the development of **our own superconducting nanowire single-photon detectors and cryogenic systems**, which will help accommodate the needs of a growing quantum network beyond the timeline of this funded research.
2. The current project enables Slovakia to actively participate in the EuroQCI European mission by developing quantum communication technologies and helping **establish a training research center** that will benefit the whole Central-European territory, creating a sustainable knowledge-based ecosystem for future quantum engineers.

1. Introduction

Objective

The objective of the outreach and dissemination activities was to increase awareness of quantum technologies, promote the objectives and achievements of the Slovak Quantum Communication Infrastructure (skQCI), and support the long-term development of the Slovak and European quantum technology ecosystem. (Task T4.4) All activities were implemented in accordance with the Dissemination, Communication and Exploitation Plan (Deliverable D4.1) and targeted a broad spectrum of stakeholders, including the scientific community, industry, public authorities, students, educators and the general public.

Throughout the duration of the project (1 January 2023 – 30 June 2026), the consortium implemented a comprehensive communication and public engagement programme combining scientific dissemination, public outreach, educational promotion and stakeholder engagement. The activities aimed not only to communicate project results but also to increase understanding of quantum technologies, stimulate collaboration between academia and industry, and support the future deployment of quantum communication infrastructures within Slovakia and the wider EuroQCI initiative.

The dissemination strategy relied on a combination of digital communication channels, participation in scientific and public events, organisation of dedicated workshops and demonstrations, cooperation with industrial stakeholders, and active engagement with national and international partners. Rather than focusing on isolated communication actions, the consortium established continuous outreach activities that accompanied the technical implementation of the project throughout the reporting period.

2. Public Communication and Popularisation

Objective

The communication activities implemented within the skQCI project were guided by the **Dissemination, Communication and Exploitation Plan** (Deliverable D1.2. *Dissemination, Communication and Exploitation Plan*), which established the overall communication objectives, target audiences, key messages, communication channels and performance indicators for the entire project duration.

Building upon this strategic framework, the consortium implemented a coordinated communication strategy throughout the implementation period (1 January 2023 – 30 June 2026). The strategy aimed to ensure continuous visibility of the project, increase awareness of quantum technologies, disseminate project achievements to relevant stakeholders and support the long-term exploitation of project results. Communication activities accompanied all major milestones of the project and were continuously adapted to reflect the project's progress and emerging opportunities.

The communication and dissemination strategy addressed multiple stakeholder groups, including:

- the scientific community;
- students and educators;
- industry and SMEs;
- public authorities and policymakers;
- cybersecurity professionals;
- the general public;
- European quantum technology initiatives and international partners.

To maximise outreach and engagement, the consortium adopted a multi-channel communication approach combining digital communication, media engagement, public events, educational activities, stakeholder meetings and visual communication. This ensured that project information reached different audiences through appropriate communication channels while maintaining a coherent visual identity and consistent messaging across all dissemination activities.

2.1 Visual Identity and Promotional Materials

To ensure consistent project recognition, the consortium developed a unified visual identity applied across all dissemination activities.

Communication materials included:

- posters;
- roll-up banners;
- brochures;
- flyers;
- presentation templates;
- exhibition graphics;
- promotional videos;
- branded merchandise.

These materials were used during conferences, exhibitions, educational activities, workshops and public engagement events, strengthening the visibility of both the skQCI project and QUTE.sk.

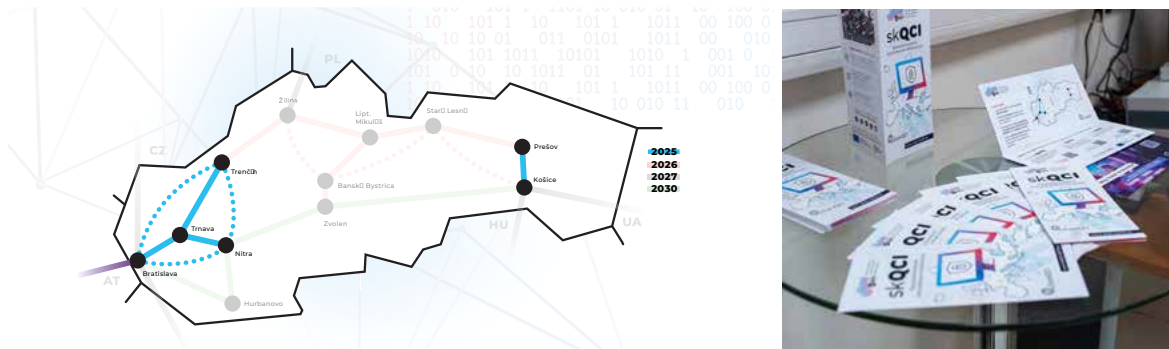


Figure 1 – Map of the infrastructure became the main visual element of the communication

2.2 Project Website and Online Presence

The dedicated **skQCI.QUTE.sk** website served as the primary communication platform dedicated to the project, providing comprehensive information on the project's objectives, consortium, work packages, achievements and dissemination activities. It represented the central information hub for stakeholders seeking detailed information about the Slovak Quantum Communication Infrastructure (skQCI).

Complementing the project website, **QUTE.sk** functioned as the main outreach and communication platform of the Slovak National Centre for Quantum Technologies. It played a key role in promoting the skQCI project to broader audiences by publishing project news, announcing educational and public engagement activities, highlighting scientific achievements and presenting opportunities for collaboration. Through its broader focus on quantum technologies, QUTE.sk significantly increased the visibility of the project among students, researchers, industry representatives and the general public.

Together, the two websites provided complementary communication channels, ensuring both detailed project documentation and broad public visibility. While **skQCI.QUTE.sk** focused on project-specific information and reporting, **QUTE.sk** served as the primary gateway to the wider Slovak quantum ecosystem, integrating educational activities, outreach events, scientific news and stakeholder engagement into a single communication platform.

The websites provided:

- information about the skQCI project and consortium;
- project news and achievements;
- educational opportunities;
- event announcements;
- research highlights;
- project deliverables and publications;
- contact information and collaboration opportunities.

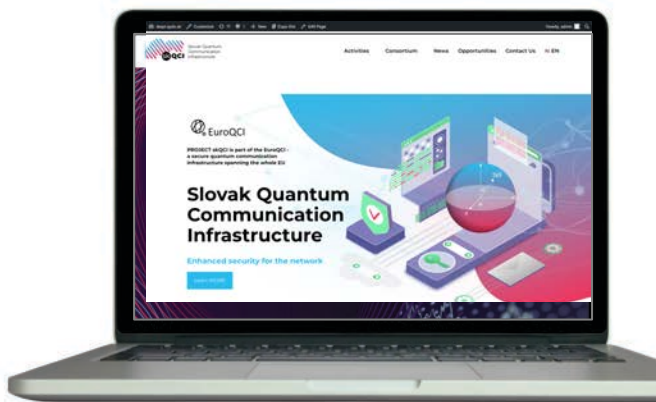
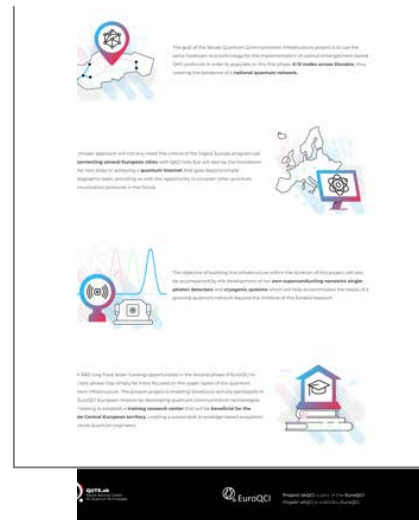


Figure 2 – Homepage of EuroQCI website



During the reporting period, the website was continuously updated to reflect project progress and newly organised activities. In addition to project information, the website became the main gateway to the Slovak quantum ecosystem by presenting educational programmes, industrial collaborations, scientific achievements and international partnerships.

2.3 News and Project Updates

Regular publication of news articles ensured continuous communication of project activities and achievements: <http://skqci.qute.sk/news/>

Throughout the reporting period, the consortium published articles covering

- project milestones;
- educational activities;
- scientific achievements;
- consortium meetings;
- outreach events;
- international collaborations;
- invited lectures;
- workshops and conferences;
- industry cooperation.

News articles were written in an accessible format suitable for both professional audiences and the general public, enabling wider dissemination of project outcomes.

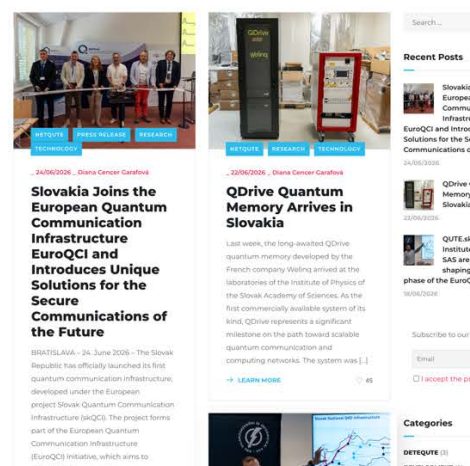


Figure 3 – Examples of published news articles

2.4 Social Media Communication

Social media represented one of the principal dissemination channels for promoting project activities and engaging with different stakeholder groups. Communication was primarily carried out through the established QUTE.sk social media channels, rather than creating dedicated project-specific accounts. By leveraging an existing and continuously growing community interested in quantum technologies, the consortium maximised the reach and impact of communication activities, ensured consistent messaging across all outreach initiatives and strengthened the visibility of the skQCI project within the broader QUTE.sk ecosystem.

Communication was coordinated across multiple platforms:

Platform	Target audience	Main purpose	Indicative results
LinkedIn	Researchers, industry	Professional networking and dissemination	Strengthened professional visibility and facilitated networking with European research and industrial stakeholders.
Facebook	General Local public	Public outreach and event promotion	Increased participation in outreach activities and public engagement
Instagram	Students	Visual communication	Improved awareness of quantum technologies among younger audiences.
X (Twitter)	International scientific community	Scientific dissemination	Enhanced international dissemination and visibility of project activities

Content included:

- promotion of events;
- project news;
- interviews;
- student opportunities;
- conference participation;
- partner achievements.

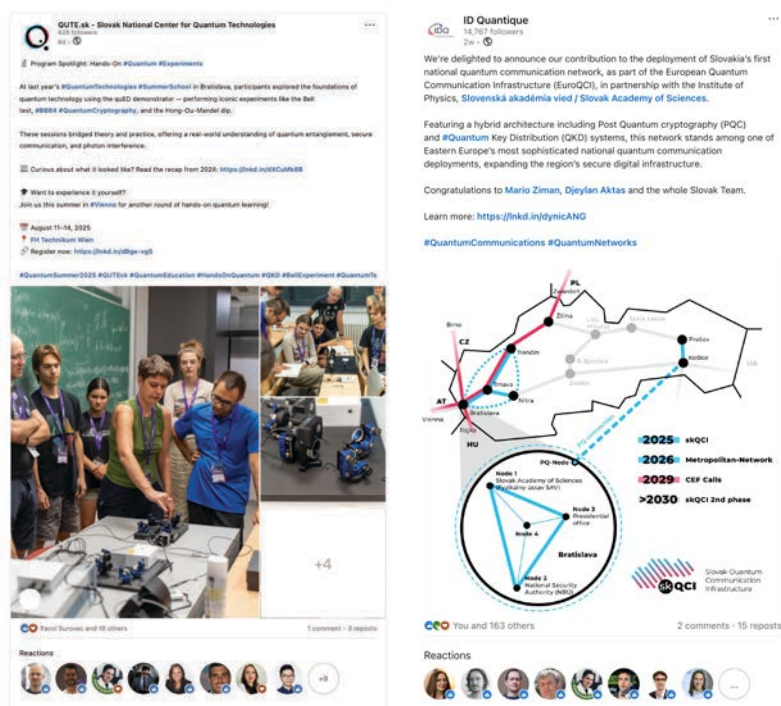


Figure 4 – Examples of social media communication

The use of multiple communication channels enabled the consortium to adapt communication to different audiences while maintaining a coherent project identity.

2.5 Media Communication

Media engagement complemented online communication by increasing awareness of quantum technologies among broader, mostly local audiences.

Project members participated in:

- television interviews;
- radio programmes;
- newspaper articles;
- online magazines;
- podcasts;
- public discussions.

Media appearances addressed topics including:

- quantum communication;
- cybersecurity;
- quantum computing;
- Slovak Quantum Communication Infrastructure;
- International Year of Quantum Science and Technology;
- future applications of quantum technologies.



Figure 5 – 11. 12. 2025, UPJŠ, Košice, During the Press Conference at the occasion of opening the first QKD link Košice-Prešov



Figure 6 – 23. 6. 2026, Vladimír Bužek (IP SAS) in National Television after the skQCI Inauguration

2.6 Multimedia Communication

To complement written communication, the consortium produced multimedia materials documenting educational activities, scientific demonstrations and public engagement events.

These included:

- promotional videos;
- educational recordings;
- interviews;
- laboratory demonstrations;
- professional photography;
- event documentation.

The multimedia content significantly extended the communication reach through digital platforms and social media while providing reusable resources for future dissemination activities.

MAIN ACHIEVEMENTS OF COMMUNITATION

- Continuous communication maintained throughout the entire implementation period.
- Central communication hub established through the QUTE.sk website.
- Active presence across multiple social media platforms.
- Regular publication of project news and educational content.
- Strong media engagement increasing public awareness of quantum technologies.
- Consistent visual identity across all dissemination activities.

- Development of reusable communication and promotional materials supporting long-term project visibility.

All communication, dissemination, and promotional activities related to the skQCI project were incorporate the **acknowledgement of EU Funding**, aligned and confirmed with the National Implementation and Coordination Authority (NIKA).



Contribution to project objectives

The communication and public engagement activities significantly increased public awareness of quantum technologies and strengthened the visibility of the skQCI project at national and international levels. We effectively communicated the objectives, progress and achievements of the skQCI project through a combination of digital communication channels, media outreach and public engagement activities.

3. Public Engagement Activities

Objective

The primary objective of the public engagement and educational activities was to raise awareness about the importance of quantum technologies, especially Quantum Communication and the skQCI project among broader, non-academic audiences, including the general public, school groups, and younger students. Guided by the strategic frameworks of the project, these activities aimed to translate quantum concepts into accessible insights, demonstrate the practical value of a national quantum communication infrastructure, and foster a sustainable knowledge-based ecosystem by stimulating early interest in quantum science.

Rather than treating outreach as isolated events, these initiatives were structured to provide a continuous public presence, successfully reaching thousands of participants across various demographics.

3.1 Large Public Events and Science Festivals

The consortium leveraged established, high-visibility public platforms to maximise outreach efficiency and tap into existing science-focused communities:

- **European Researchers' Night (2023, 2024, 2025):** Serving as a cornerstone of public outreach, the project maintained a highly interactive presence across multiple years. The consortium deployed dedicated booths featuring real-time hands-on demonstrations, allowing school groups and the general public to interact with quantum optical elements and basic cryptography setups.



Figure 8 – Activities during the European Researchers' Night 2024

- **OpenSlava (2023, 2024, 2025):** The project was actively represented at this major regional emerging technology and IT conference. By presenting skQCI's progress, the consortium engaged directly with tech enthusiasts, software developers, and IT professionals, positioning quantum infrastructure within the broader landscape of future digital ecosystems.



Figure 9 – OpenSlava 2024 (workshop, booth and talk)

- **Week of Science and Technology (Týždeň vedy a techniky):** This national event was actively leveraged by the project team to organize open days and presentations aimed at disseminating project achievements to a broad spectrum of the local community.

- **SAS events:** The consortium participated in key local science festivals in cooperation with Slovak Academy of Sciences, including “We are Slovak Academy of Science” (*My sme SAV*), “Science on the castle” (*Veda na zámku*), “Science Fair Prague” (*Veletrh vědy Praha*). These platforms were used to deliver public-facing presentations and demonstration.

3.3 High-schools and Virtual Classrooms

To cultivate the next generation of scientific talent, specific initiatives were launched to target primary and secondary education systems:

- **Virtual Classroom KVANTA (2025–2026):** To overcome geographical limitations and reach schools outside major academic hubs, the hybrid educational platform *KVANTA* was actively deployed. This platform served as interactive bridge, introducing the fundamentals of quantum mechanics through custom-produced educational videos, animations, and learning packages tailored specifically for high-school students. More: <https://qute.sk/sk/kvanta/>



Figure 10 – OpenSlava 2024 (workshop, booth and talk)

- **Lectures at High-schools:** Outreach lectures designed to present quantum technologies in an accessible and engaging way, combining theoretical concepts with practical demonstrations to stimulate students' interest in modern science and technology.



Figure 11 – 11. 12. 2025, Košice, Demonstration of quantum key distribution (QKD) took place between Pavol Jozef Šafárik University in Košice and the University of Prešov, attended by over 200 high school students.

Figure 12 – 4. 9. 2025 – Marián Janík: Starší mladším: About Qunatum Computing, Gymnázium Grösslingová, Bratislava

- **Summer schools for young students, School Visits and Open Laboratories:** Partner research institutions regularly opened their doors to high-school cohorts. These visits combined introductory lectures with safe access to open laboratory spaces, where students observed Photon Pair Source, single-photon detection apparatuses and cryogenic testing environments in action



Figure 13 – Several laboratory visits and practical demonstration of QKD

3.4 The Quantum Experience and Public Lectures

The consortium organized dedicated public lectures and specialized hybrid events to facilitate deeper engagement:

- **World Quantum Day (2023, 2024, 2025):** Annually organizing public event “Quantum Entanglements” (*Kvantové zápletky*) in Bratislava as part of the *World Quantum Day* celebrations. This event marked our participation in the global initiative aimed at raising awareness of quantum science and its practical applications. The positive reception has motivated us to make World Quantum Day an annual event in our public outreach efforts.



Figure 14 – Celcebration of World Quantum Day 2024

- **Quantum Slovakia Expedition:** This initiative continued to bring quantum science closer to the public through interactive sessions and demonstrations. Traveling to multiple locations across Slovakia (Žilina, Nitra, Banská Bystrica, Žiar nad Hronom, Prešov), the program engaged students and general audiences in popular talk and discussions about the future of quantum technologies.



Figure 15 – Quantum Slovakia Expedition

- **UNESCO International Year of Quantum Science and Technology:** Aligning with the global UNESCO initiative, the consortium expanded its public lecture portfolio. Project members delivered accessible talks in public science cafes, libraries, and online streaming platforms, explaining how secure quantum key distribution (QKD) links protect private citizen data in the modern digital age. Web page dedicated to our activities during IYQ 2025: <https://www.qute.sk/quantum2025/>



Figure 16 – Overview of the activities during International Year of Quantum Science and Technology 2025

- **Quantum Experience (2024):** This career-oriented flagship outreach event combined introductory scientific talks, laboratory tours, and informal panel discussions. It was strategically designed to reveal academic and industrial career paths within the emerging quantum ecosystem, targeting early undergraduate and university students.

3.5 Popular Science Articles

- **Quantum World at Magazine Quark:** To further strengthen public awareness of quantum technologies, the IP SAS and QUTE.sk monthly contributed to the *Quantum World* section of the Slovak popular science magazine *Quark*. The published articles presented the principles, applications and societal relevance of quantum technologies in an accessible manner, helping to increase quantum literacy among the general public while promoting the activities and achievements of the skQCI project and QUTE.sk. All articles listed here: <https://www.qute.sk/quniverse-en/quantum-world/>



Figure 17 – Popular articles in Magazine Quark

CONTRIBUTION TO PROJECT OBJECTIVES

The public engagement and educational activities successfully advanced the core strategic missions of the skQCI project:

- Increasing Public Awareness by combining digital tools with direct face-to-face engagement at major public festivals and media-supported events, the consortium
- built clear public understanding and national visibility for the skQCI project and the wider EuroQCI initiative.
- Building Future Human Capacity as a crucial recruitment and education funnel, stimulating interest among younger students
- establishing a coordinated national platform for future quantum technology education.
- Involving doctoral students and early-stage researchers in preparing and running the knowledge transfer equipping the next generation of engineers with both technical and communication skills needed to maintain the infrastructure in the long term.

4. Scientific Dissemination and Knowledge Exchange

Objective

Distinct from general public communication, scientific dissemination strictly targeted academia, specialized researchers, and advanced hardware engineers.

The primary objective was to share the concrete technical and scientific breakthroughs generated within the skQCI project, thereby embedding the Slovak quantum research community firmly within the wider European scientific landscape.

4.1 Scientific Conferences

Throughout the project implementation, consortium members actively disseminated research results at national and international scientific conferences. Participation in scientific events enabled the presentation of project achievements, exchange of knowledge with the international research community and establishment of new collaborations supporting the objectives of the skQCI project.

4.2 Invited Talks and Lectures

- **Invited Expert Talks:** Senior project researchers delivered numerous invited lectures at foreign universities and specialized research institutes, detailing the unique deployment challenges of building a national six-node QKD backbone.



Figure 18 – 30. 11. 2025, LinkedIn, Online invitation to a lecture

4.3 Specialized Workshops and Meetings

Beyond traditional publishing, scientific knowledge transfer was achieved through direct peer interaction:

- **Scientific Meetings and Technical Workshops:** The consortium regularly hosted and participated in technical workshops, including dedicated *QuantERA* meetings. These smaller, highly focused working groups allowed

for detailed technical benchmarking, interoperability tracking across European quantum network layers, and the sharing of experimental data on photon source efficiencies.

4.4 Scientific Publications

The consortium actively disseminated scientific results through peer-reviewed publications in international journals, conference proceedings and preprints, contributing to the advancement of quantum communication, quantum optics and quantum information science.

- **Peer-Reviewed Publications:** Scientific papers regarding entanglement-based QKD protocols, superconducting nanowire single-photon detectors (SNSPDs), and cryogenic optimization were submitted to high-impact international journals.

MAIN ACHIEVEMENTS

- Throughout the project implementation, the consortium successfully:
 - presented project results at numerous national and international scientific conferences;
 - delivered invited talks at universities and research institutions;
 - organised scientific workshops supporting collaboration within the quantum community;
 - published research results in peer-reviewed journals;
 - strengthened collaboration with European quantum initiatives;
 - increased the international visibility of Slovak quantum research.
- Contribution to project objectives

Scientific dissemination activities ensured that the knowledge generated within the skQCI project was effectively shared with the international research community. These activities strengthened the scientific excellence of the project, facilitated international collaboration, supported technology transfer and contributed to the broader objectives of the EuroQCI initiative by promoting interoperability, knowledge exchange and the development of quantum communication technologies across Europe.

5. Industry, Stakeholder and Policy Engagement

Objective

Throughout the project implementation, the consortium actively collaborated with industry partners, public authorities, cybersecurity experts and European initiatives to promote knowledge exchange, identify application opportunities and strengthen the national quantum ecosystem. Stakeholder engagement activities complemented the scientific and educational objectives of the project by facilitating dialogue between researchers, technology developers, future users and policymakers. These interactions contributed to increasing awareness of quantum technologies, supporting technology transfer and aligning the project outcomes with national and European strategic priorities.

Stakeholder Group	Representative Partners	Expected Impact
Industry	Accenture, Aricoma, IBM, technology companies	Increased awareness and adoption of quantum technologies through technology transfer, training, workshops
Public Authorities	MIRRI, NSA, ministries, NASES	Support for national quantum communication infrastructure via policy dialogue, cybersecurity, infrastructure deployment
European Initiatives	EuroQCI, Petrus, European Commission	Alignment with European quantum infrastructure with strategic cooperation, interoperability, networking
Research organisations	Universities, research institutes, innovation organisations	Strengthened national and international scientific collaboration and knowledge exchange

5.1 Industry Collaboration and Technology Transfer

Collaboration with industry played an important role in increasing awareness of quantum technologies and promoting their future adoption. The consortium actively engaged with technology companies and industrial partners through workshops, networking events, expert discussions and collaborative activities. These interactions facilitated knowledge transfer between research organisations and industry while creating opportunities for future cooperation in quantum communication and cybersecurity.

- **Accenture Technology Solutions:** The consortium established collaboration with Accenture through specialised workshops, expert discussions and educational activities focused on quantum technologies, quantum-safe cybersecurity and future workforce development. These interactions strengthened the exchange of knowledge between academia and industry while promoting awareness of quantum communication technologies among IT professionals.
- **Aricoma and IBM:** The consortium actively engaged with leading ICT companies through workshops, consultations and networking activities to discuss the potential applications of quantum communication technologies, including Quantum Key Distribution (QKD), quantum-safe cybersecurity and the future integration of quantum technologies into enterprise ICT infrastructures.

5.2 Industry Collaboration and Technology Transfer

To prepare non-academic sectors for the post-quantum transition, Work Package 4 directly implemented commercial and policy outreach:

- **Tailored Training Packages:** The consortium developed a modular portfolio of training resources hosted on the QUTE.sk portal. These packages provided highly targeted introductions to quantum computing and quantum-safe cybersecurity, designed specifically for software developers, banking professionals, and data security officers. Available online: <https://qute.sk/trainings/>
- **Expert Consultation Services:** Throughout the project implementation, the consortium promoted knowledge exchange between academia and industry by providing expert consultations, specialised training and stakeholder workshops. These activities facilitated dialogue on future applications of quantum technologies, strengthened connections with industrial stakeholders and contributed to the long-term exploitation potential of the project's outcomes.

5.3 Public Authorities and Policy Support

The successful deployment of the Slovak Quantum Communication Infrastructure requires close cooperation between research organisations, public authorities and national stakeholders responsible for cybersecurity, digital transformation and critical infrastructure. Throughout the project implementation, the consortium actively engaged with relevant ministries, governmental organisations and public institutions to promote awareness of quantum communication technologies and support their future deployment within Slovakia.

Representatives of the consortium participated in expert meetings, consultation activities and strategic discussions addressing the implementation of the national Quantum Communication Infrastructure (QCI), quantum-safe cybersecurity and the integration of Slovakia into the broader EuroQCI initiative. These activities provided an opportunity to present the project's progress, discuss technological developments and exchange expertise with organisations responsible for national digital infrastructure and cybersecurity.

In addition to policy dialogue, the consortium delivered specialised presentations and consultation activities tailored to the needs of public authorities and governmental stakeholders. These activities focused on explaining the principles of quantum communication, the strategic importance of Quantum Key Distribution (QKD), and the expected impact of quantum technologies on secure communications and critical infrastructure protection.

A significant milestone was the signing of a Memorandum of Cooperation with the **Office of the President of the Slovak Republic** and the **National Security Authority of the Slovak Republic**, establishing a strategic framework for cooperation in the development of the national quantum communication infrastructure. The memorandum reflected the growing recognition of quantum technologies as a strategic priority for the security and digital resilience of Slovakia and strengthened cooperation between the scientific community and the country's highest public institutions.



Figure 19 – 28. 10. 2025, Before signing the Memorandum of Cooperation with the Chief of Staff the Office of the President of the Slovak Republic, Peter Vodráška.

Figure 20 – 8. 12. 2025, QUTE.sk signed a memorandum of cooperation with, the National Security Authority (NBÚ)

The continuous engagement with public authorities strengthened the alignment of the skQCI project with national priorities and created a solid foundation for the future deployment, operation and long-term sustainability of the Slovak Quantum Communication Infrastructure.

5.4 European Collaboration and Strategic Networking

The skQCI project was implemented as an integral part of the broader European effort to establish a secure quantum communication infrastructure across Member States. Throughout the project implementation, the consortium actively contributed to the European quantum ecosystem through scientific collaboration, strategic networking and participation in international initiatives supporting the deployment of quantum communication technologies.

Beyond EuroQCI, the consortium established and strengthened collaborations with leading European research institutions, universities and industrial partners. Key collaborators included FH Technikum Wien, ZeroThird, qtlabs, Single Quantum, ID Quantique / IonQ, Welinq, Quantum Optics Jena and partners participating in European initiatives. These collaborations supported joint research activities, educational programmes, scientific workshops, technology demonstrations and the exchange of expertise in quantum communication, quantum photonics and quantum networking.



Figure 21 – Collaboration with different companies (ZeroThird, ID Quantique, Welinq)

International networking was further strengthened through active participation in European conferences, specialised workshops and invited lectures, where consortium members presented project achievements and established new collaborations with research organisations, technology providers and industrial stakeholders. The project also contributed to discussions on the future deployment of quantum-safe communication technologies, interoperability of national quantum communication infrastructures and the development of a skilled European quantum workforce.



Figure 22 – 2. 7. 2025, Prof. Vladimír Bužek as a member of the High-Level Advisory Board, alongside Henna Virkkunen – Executive Vice-President of the European Commission for Technological Sovereignty, Security, and Democracy.

The consortium actively promoted the Slovak quantum ecosystem within Europe by presenting the activities of QUTE.sk and the skQCI project at international events and by fostering long-term collaborations between academia, industry and public institutions. These partnerships significantly increased the international visibility of the project, supported knowledge exchange and created new opportunities for future collaborative research, education and innovation beyond the duration of the project.

MAIN ACHIEVEMENTS

- strengthened collaboration with European partners supporting the implementation of the EuroQCI initiative;
- established long-term partnerships with leading research institutions, universities and technology providers;
- actively participated in European workshops, conferences and strategic networking activities;
- promoted the Slovak quantum ecosystem within the European quantum technology community;
- facilitated international knowledge exchange supporting research, education and future deployment of quantum communication technologies;
- reinforced the long-term sustainability and international impact of the skQCI project through strategic European collaborations.

Contribution to project objectives

Stakeholder engagement activities significantly strengthened the impact of the skQCI project by connecting research, education and innovation with future users of quantum technologies. The established collaborations supported knowledge transfer, increased awareness of quantum communication infrastructures and contributed to preparing the conditions for the future deployment of quantum-safe communication technologies in Slovakia. Furthermore, the active involvement of industrial partners, public authorities and European initiatives reinforced the long-term sustainability of the project outcomes and strengthened the position of Slovakia within the emerging European quantum ecosystem.

6. International Visibility and Networking

Objectives

International collaboration was vital to ensuring that the skQCI network architectural standards remain fully interoperable with neighbouring national infrastructures across Central Europe. The consortium utilized multiple European funding frameworks and collaborative research channels to amplify its international footprint.

6.1 Key Cross-Border Collaborations and Industrial Partnerships

- **FH Technikum Wien (Austria):** The consortium established an institutional educational and technical alliance with FH Technikum Wien. This bilateral cooperation served as a primary conduit for joint training initiatives, curriculum development, and cross-border knowledge exchange.
- **Single Quantum (Netherlands):** To support the development of proprietary superconducting single-photon detectors, the project engaged in targeted technical exchanges with industry-leading European quantum hardware manufacturers, including *Single Quantum*, facilitating advanced component benchmarking and technology insights.

- **ZeroThird & qtlabs (Austria):** The consortium collaborated with Austrian companies ZeroThird and qtlabs through technical consultations, educational activities and stakeholder engagement. These interactions strengthened links between academia and industry while supporting knowledge transfer and raising awareness of emerging quantum technologies.
- **ID Quantique (Switzerland):** The consortium established collaboration with ID Quantique, a leading provider of quantum communication technologies, mostly through technical discussions and knowledge exchange. The cooperation provided valuable insights into state-of-the-art Quantum Key Distribution (QKD) technologies and supported alignment with industrial best practices.
- **Quantum Optics Jena (Germany):** Collaboration with Quantum Optics Jena focused on scientific networking and technical exchange in the fields of quantum optics and photonic technologies. These interactions facilitated the sharing of expertise, promoted international cooperation and supported the development of advanced quantum communication components.
- **EuroQCI:** Project representatives maintained continuous participation in European coordination meetings, technical workshops and stakeholder discussions supporting the implementation of the EuroQCI initiative. These activities ensured alignment of the Slovak Quantum Communication Infrastructure with the evolving European architecture, facilitated knowledge exchange with national QCI projects and strengthened collaboration within the European quantum communication community.



Figure 23 – 16.–17. 9. 2025 – Pavol Surovec presenting the project at an international meeting in Tallinn

Figure 24 – 28.–30. 4. 2025, QCI Days, Athens

6.3 Cross-Border Mobility and Academic Exchanges

- **The mobiQUTE Scheme:** Funded and organized via the QUTE.sk association, the *mobiQUTE* scheme actively supported international

mobility for young researchers. It provided travel grants for doctoral candidates and postdocs to conduct collaborative research visits at elite foreign universities and international research facilities. This program significantly expanded the professional networks of Slovak researchers within the wider European quantum technology community.

- **International Invited Talks:** Project representatives regularly presented skQCI's technical breakthroughs as invited speakers at foreign academic institutions, cementing Slovakia's reputation as a rapidly emerging center of excellence for quantum engineering in the Central European region.

7. Impact and Sustainability

Objective

The skQCI project significantly strengthened the international visibility of Slovak quantum research and innovation by actively participating in European and international collaborations, scientific networks and strategic initiatives. International networking activities supported knowledge exchange, promoted the Slovak quantum ecosystem abroad and established long-term partnerships contributing to the sustainability of the project beyond its implementation period.

7.1 Measurable Communication and Dissemination Impact

The comprehensive communication, dissemination and outreach activities implemented throughout the project have generated a lasting impact on the visibility of quantum technologies in Slovakia and strengthened the recognition of the skQCI project at both national and European levels.

- **Increased Public and Media Awareness:** Through continuous communication activities, the consortium significantly increased public awareness of quantum technologies and their societal relevance. Project representatives were featured in leading Slovak media, including STVR (Experiment, :24 Ekonomika, Veda zblízka, VAT) TV JOJ (Spektrum), Markíza (Teleráno), Radio Devín, TA3 as well as in national online media and popular science magazines. These appearances successfully transformed quantum technologies from a highly specialised research topic into a subject of broader public interest, reaching audiences of hundreds of thousands to millions of viewers, listeners and readers across Slovakia.



Figure 25 – 22. 9. 2025 – Presenting LEGOratorium in Telerano at TV Markíza

Figure 26 – 22. 2. 2025, Mário Ziman in Aktuálne :24, STVR

- **Sustainable Online Communication Infrastructure:** The establishment of the websites – skQCI.QUTE.sk and the broader communication platform QUTE.sk – created a sustainable digital infrastructure for disseminating project results, promoting educational opportunities and communicating with students, researchers, industry representatives and policymakers. Together with the project's social media channels, these platforms continue to serve as the primary gateway to quantum technologies in Slovakia.
- **Recognition by National and European Stakeholders:** The visibility and relevance of the project were further demonstrated through visits of high-level representatives from both the **European Commission** and the **Slovak Republic**. The consortium welcomed the official delegation of the European Commission, which visited the project to review its progress, infrastructure and educational activities. In addition, the project and the QUTE.sk initiative were presented during the visit of the President of the Slovak Republic Peter Pellegrini, highlighting the strategic importance of quantum technologies for the country's future research, innovation and digital security.

Beside that IP SAS lab accommodated the visit of His Excellency Mr. Gabriel Boff Moreira, Ambassador of Brazil to Slovakia.



Figure 27 – 12. 3. 2025, During his visit to the Quantum Communication Laboratory at the Institute of Physics, Slovak President Peter Pellegrini discussed the project with its leader, Djeylan Aktas, and the institute's director, Mário Ziman.

Figure 28 – 5. 12. 2024, The skQCI project was included in the program of the official visit of the European Commission delegation to Slovakia, under the auspices of

Peter Kmec, Deputy Prime Minister of the Slovak Republic for the Recovery Plan and Knowledge Economy.

Figure 29 – 9. 7. 2024, Visit of His Excellency Mr. Gabriel Boff Moreira, Ambassador of Brazil to Slovakia.

- **Growing National Quantum Ecosystem:** The communication and outreach activities successfully established QUTE.sk as a recognised national platform for quantum technologies, connecting academia, industry, public authorities and the wider public while supporting the long-term development of the Slovak quantum ecosystem.

7.2 Human Capacity and Long-Term Educational Sustainability

Rather than focusing on ephemeral events, the project successfully prioritized the establishment of permanent institutional structures within Work Package 4 (*eduQUTE*):

- **Permanent Academic Curriculum Integration:** The preparation of the novel university study (jointly designed by Comenius University Bratislava and QUTE.sk), along with localized course expansions at UPJŠ Košice and STU, ensures that quantum engineering remains embedded in formal higher education indefinitely.
- **Sustainable Career Schemes (*phdQUTE* & *fellowQUTE*):** The recruitment of 11 doctoral positions under *phdQUTE* has injected a new generation of researchers directly into active laboratory environments. Furthermore, by securing long-term funding for the *fellowQUTE* international postdoctoral scheme directly through the QUTE.sk organizational budget rather than relying solely on the temporary project lifespan, the consortium ensured a permanent mechanism for attracting elite international research talent to Slovakia.

7.3 Long-term Impact and Commercial Exploitation

The ultimate sustainability of skQCI rests upon its transition into a fully functional, self-sustaining ecosystem:

- **Ecosystem Foundation:** By combining state-of-the-art national hardware deployment (the six-node QKD backbone) with a robust training and education center, the project has built a self-replenishing workforce of qualified engineers capable of operating, expanding, and maintaining the infrastructure far into the future.
- **Exploitation Pathway:** The established technology transfer channels, ongoing market surveys, and continuous strategic consultations with consulting giants like Accenture provide a clear, operationalized roadmap for commercializing in-house prototypes. This ensures that the technical

expertise generated by the European Union's funding will sustainably support European technological independence and industrial sovereignty for years to come.

SUSTAINABILITY

The sustainability of the project is supported through:

- the continued operation and development of the **QUTE.sk** platform;
- established national and international partnerships;
- reusable educational resources and training materials;
- long-term cooperation with schools, universities and industry;
- continued participation in European quantum initiatives;
- integration of project outcomes into future research, education and outreach activities.

These activities provide a solid foundation for the continued development of quantum technologies in Slovakia and contribute to the long-term objectives of the European Quantum Communication Infrastructure.

Conclusion

The outreach and dissemination activities implemented throughout the skQCI project successfully supported the communication objectives defined in the Dissemination, Communication and Exploitation Plan and significantly contributed to increasing the visibility of quantum technologies in Slovakia. Through a comprehensive programme of public communication, educational outreach, scientific dissemination, stakeholder engagement and international collaboration, the consortium established a strong and recognisable national quantum ecosystem centred around the QUTE.sk platform.

The project effectively connected researchers, students, educators, industry representatives, public authorities and the wider public, promoting a broader understanding of quantum technologies and their future applications. The communication strategy ensured continuous visibility of the project, while the educational and outreach activities inspired future talent, strengthened collaborations and facilitated knowledge transfer across different sectors.

Beyond the immediate project objectives, the activities established sustainable communication channels, educational resources and strategic partnerships that will continue to support the development of quantum technologies in Slovakia. Together, these achievements have strengthened the country's position within the European quantum community and created a lasting foundation for future research, innovation, education and the deployment of secure quantum communication infrastructures.

Overall, the outreach and dissemination activities transformed the skQCI project from a national infrastructure initiative into a recognised platform for quantum education, communication and stakeholder engagement, creating a lasting impact on the Slovak quantum ecosystem and contributing to the broader objectives of the European Quantum Communication Infrastructure (EuroQCI).