

SNS-OPS 2024 Questionnaire for Call 1 Projects Review

Disclaimer: The information presented here is based on survey results, so the conclusions and insights drawn are dependent on the responses received. Please consider these factors when interpreting the findings.

Jan 2023

35 PROJECTS

→ Dec 2023

EVENTS

 **100** Organised
314 Supported or contributed

TESTS & TRIALS

 **46** Proof of concepts & lab tests
25 Trials & pilots

PUBLICATIONS

 **129** Peer reviewed articles
14 White papers
230 Conference papers

CONTRIBUTIONS TO STANDARDS

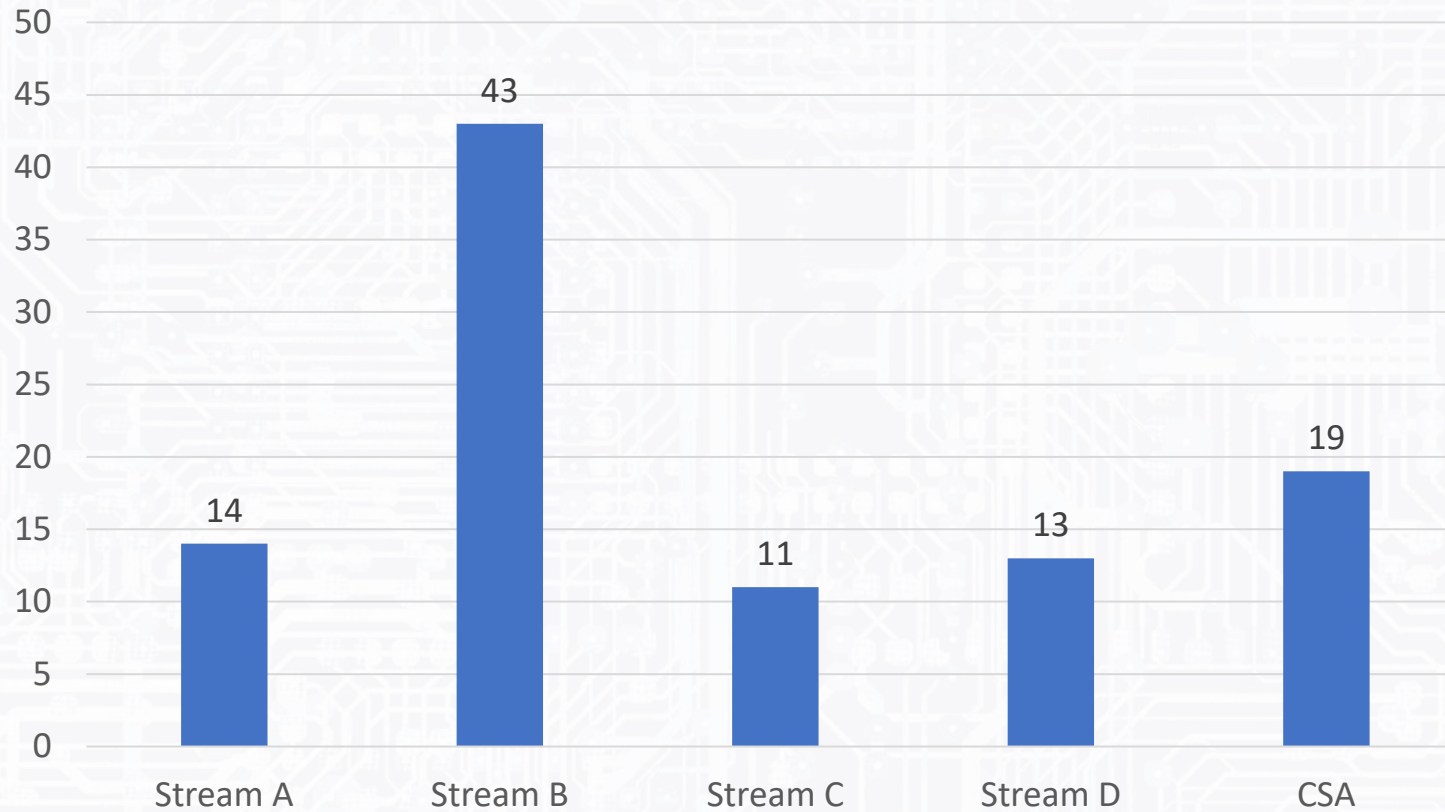
 **308**

 **32** PATENT APPLICATIONS

OPEN SOURCE

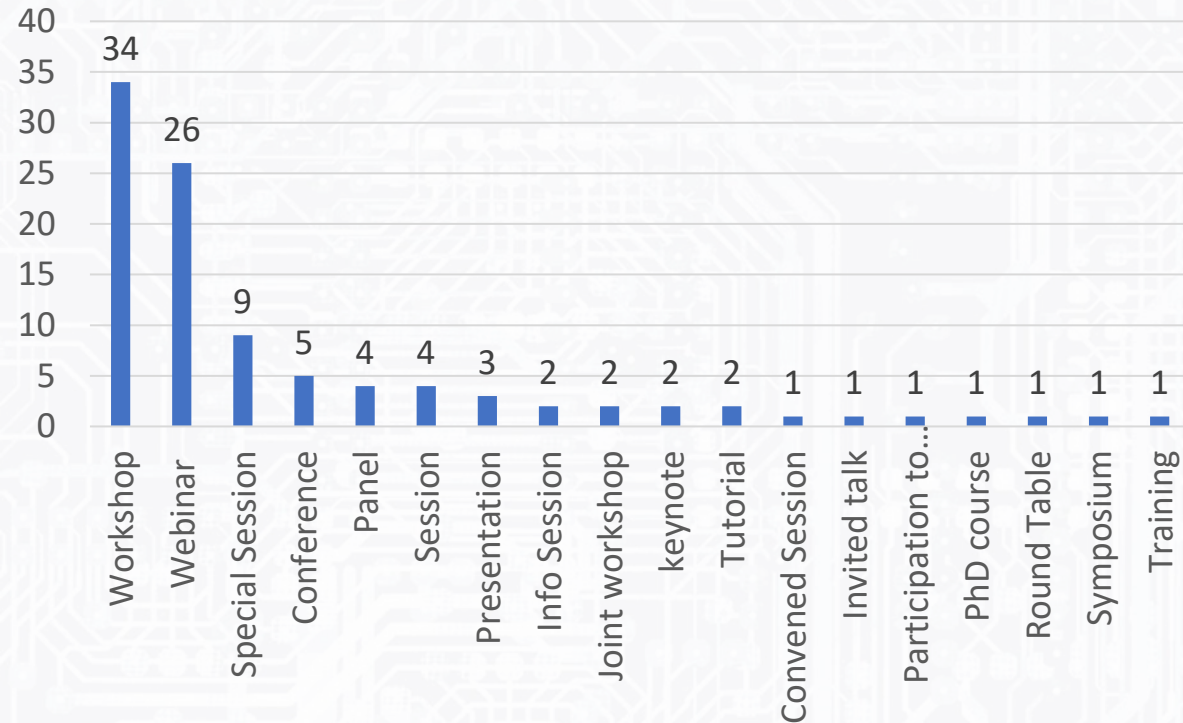
 **132** Solutions used
CONTRIBUTIONS
29 Submitted
23 Accepted

Q1. How many events (webinars, workshops, sessions, panels, keynotes) has your project organised in 2023? (Per Stream)



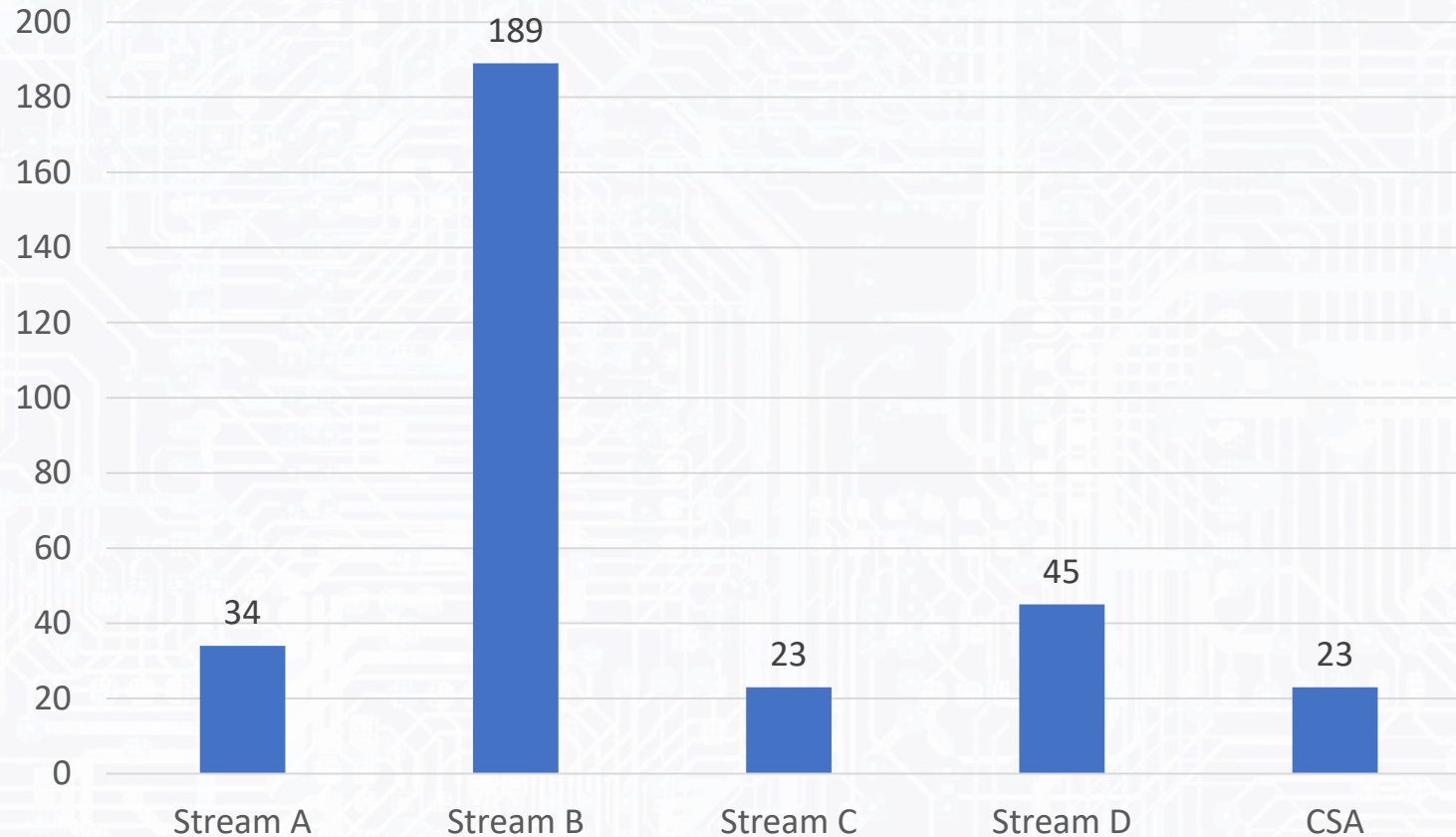
- Total events organized 100.
- Stream B is the leading stream with organized 43 events.
- SNS ICE (CSA) project has the highest event organization with 13 events.

Q1. How many events (webinars, workshops, sessions, panels, keynotes) has your project organized in 2023? (Per Event)



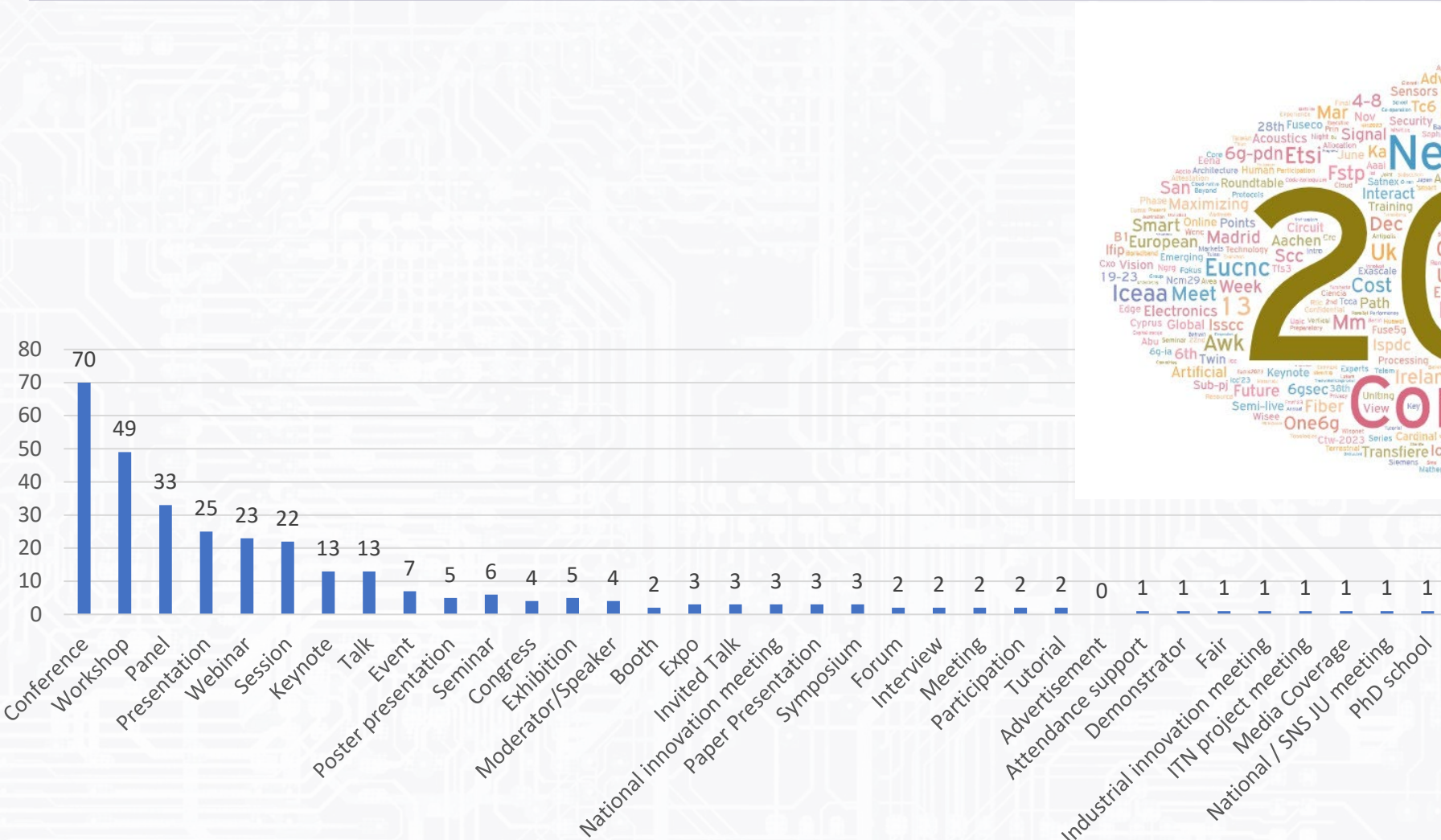
Event Names / Titles

Q2. How many events (webinars, workshops, sessions, panels, keynotes), NOT organized by your project, has your project supported/contributed to? (Per Stream)



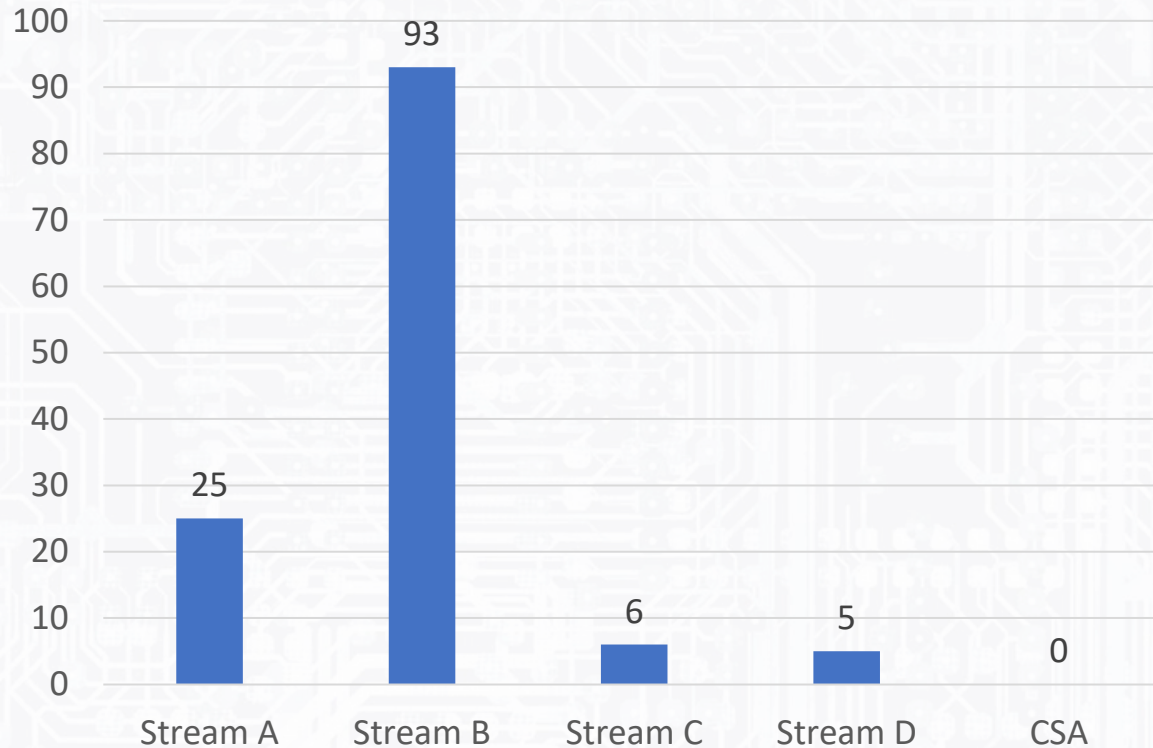
- Total events supported/contributed are 314.
- Stream B is the leading stream with supporting /contributing to 189 events.
- ADROIT6G (Stream B) project has the highest event support / contribution with 22 events.

Q2. How many events (webinars, workshops, sessions, panels, keynotes), NOT organized by your project, has your project supported/contributed to? (Per Event)

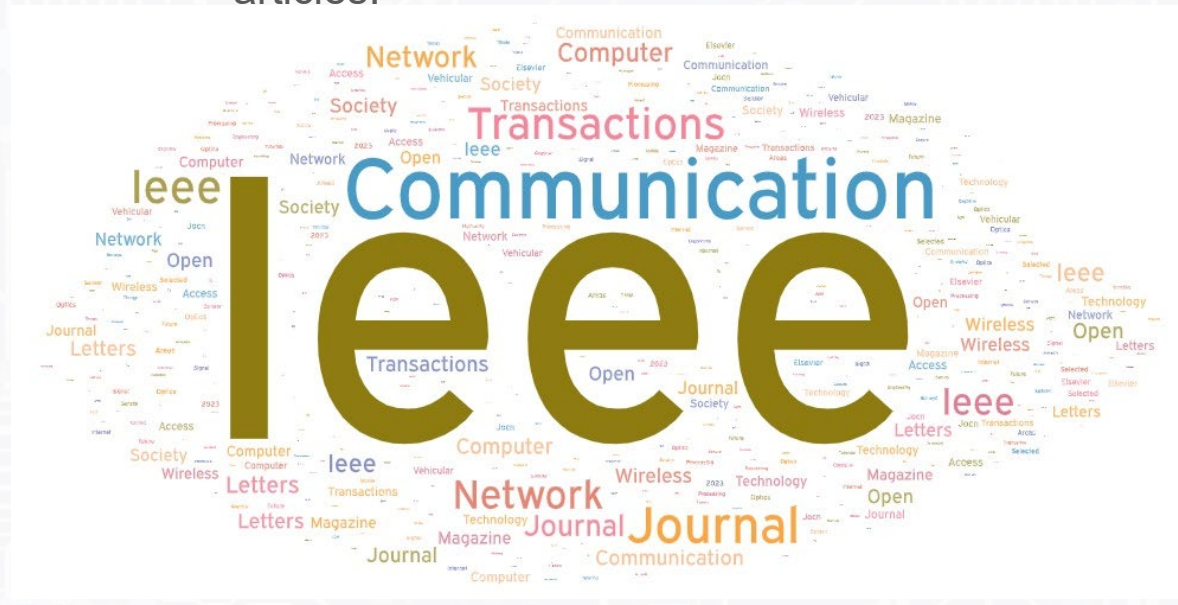


Event Names / Titles

Q3. How many peer-reviewed journal/magazine articles has your project authored?

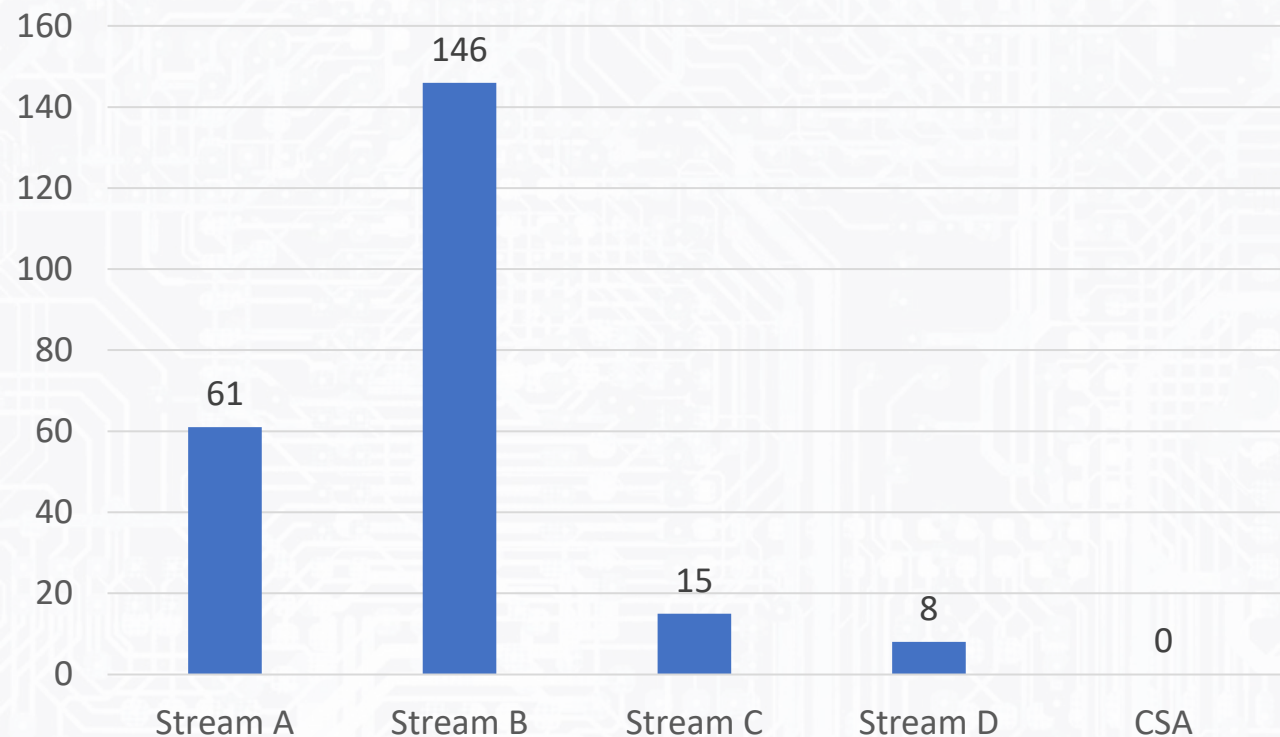


- Total authored peer-reviewed journal/magazine articles are 129.
- Stream B is the leading stream with authoring to 93 peer-reviewed journal/magazine articles.
- Hexa-X-II (Stream B) project has authored highest, 14 peer-reviewed journal/magazine articles.



Journal / Magazine names / titles

Q4. How many conference papers has your project authored?

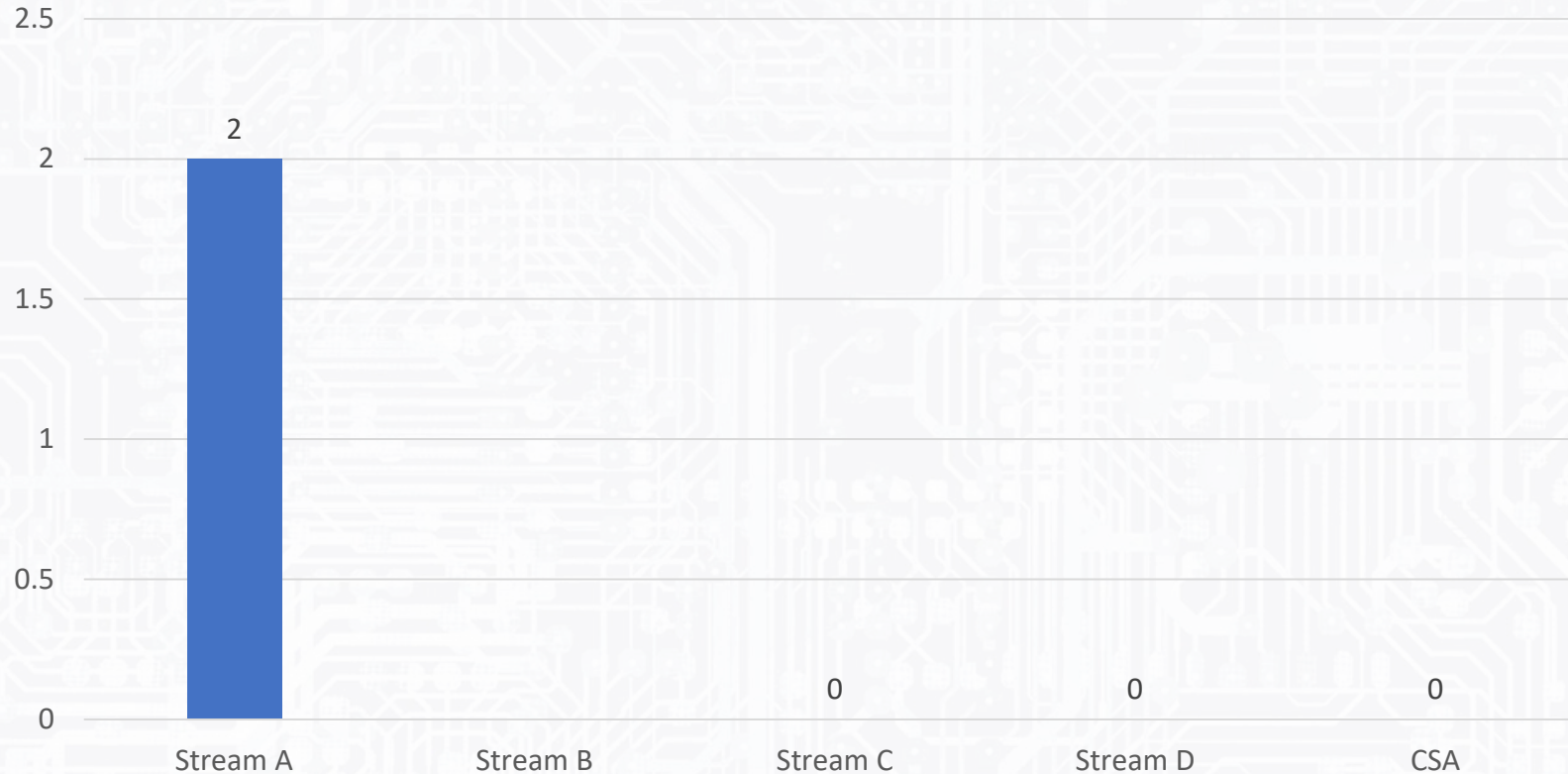


- Total conference papers that have projects authored are 230.
- Stream B is the leading stream with 146 authored conference papers.
- SEASON (Stream A) project is the highest authored project with 33 conference paper.



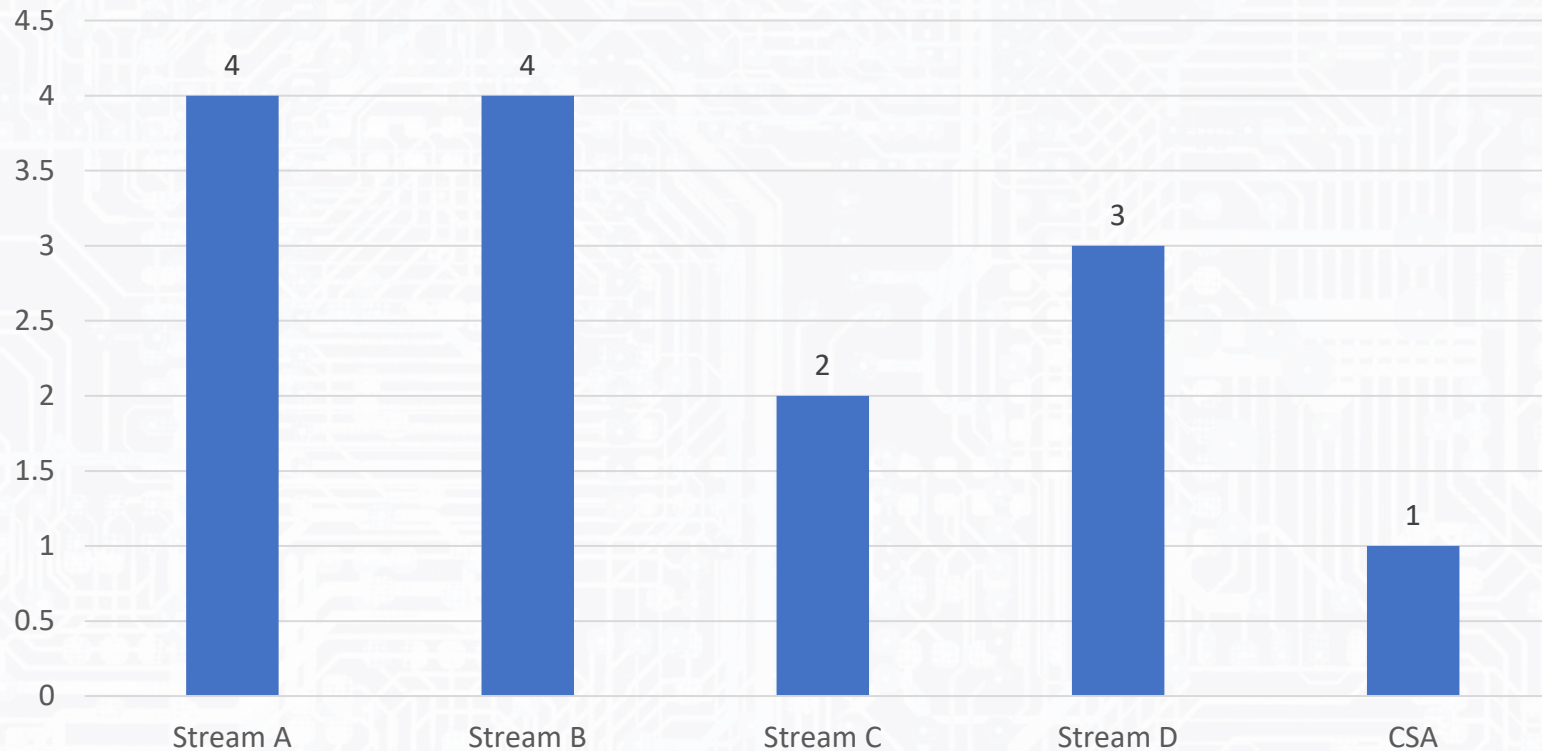
Conference Names

Q5. How many book chapters has your project authored or contributed to?



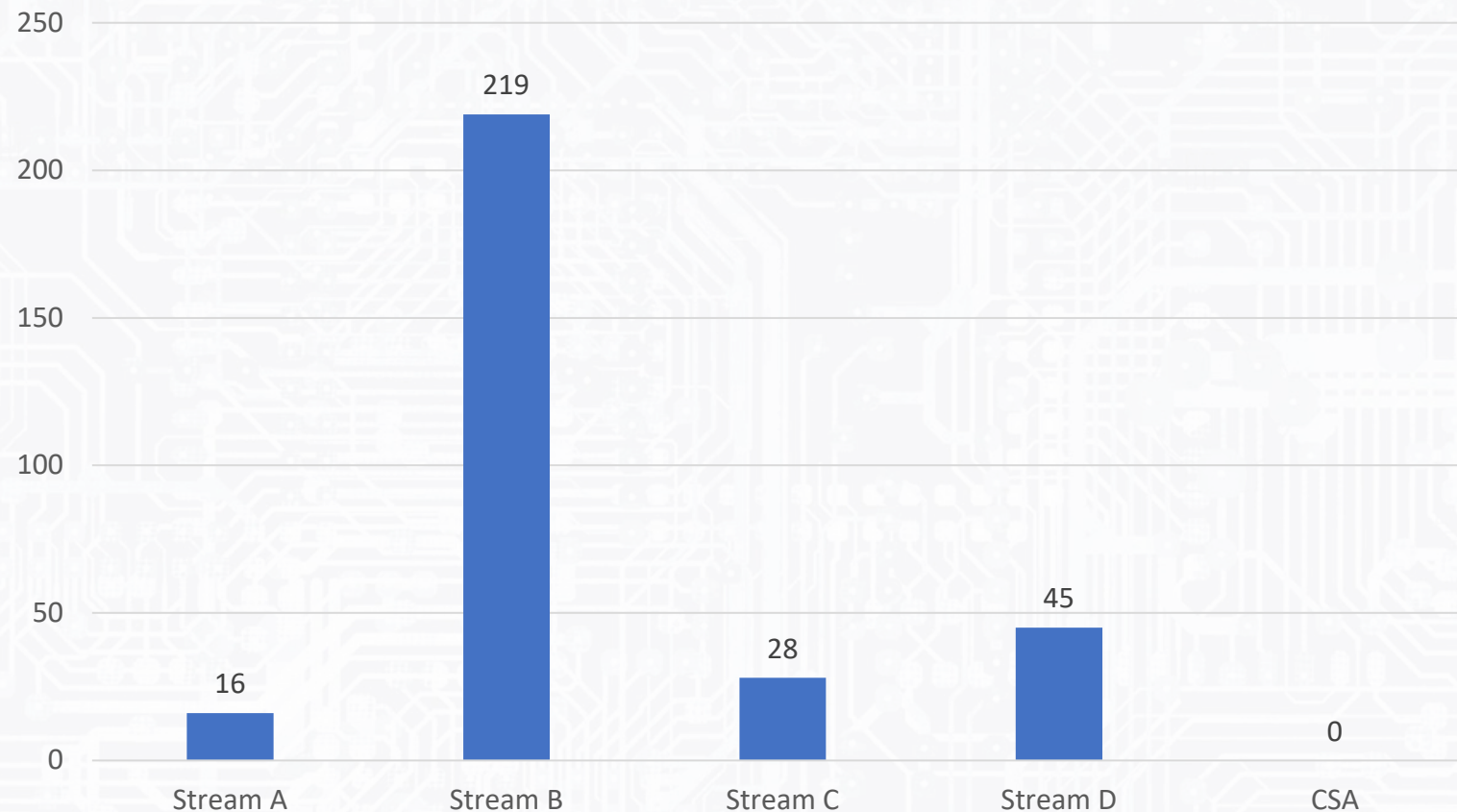
- Total book chapters that have projects contributed are 2.
- NANCY (Stream A) project contributed to 2 book chapters.

Q6. How many whitepapers has your project authored or contributed to?



- Total whitepapers projects have authored or contributed are 14.
- Stream A and B projects contributed or authored highest with 4 whitepapers.
- SEASON (Stream A) project has authored or contributed to 4 whitepapers highest amongst other projects.

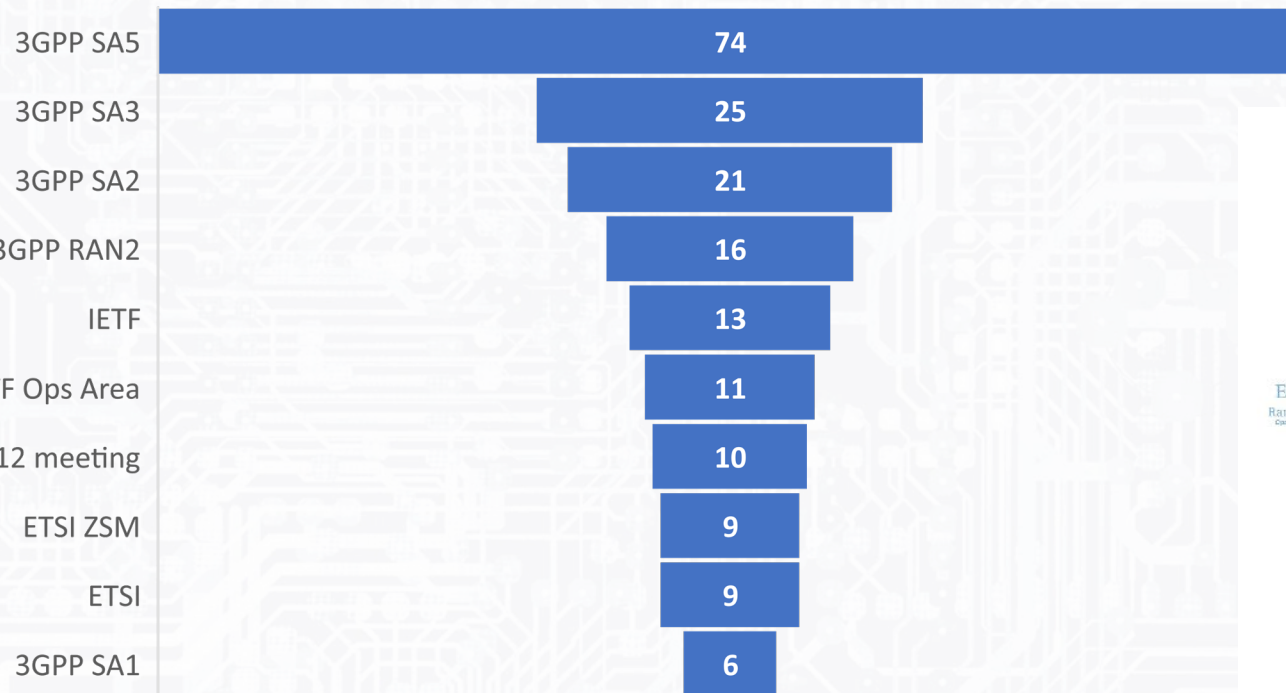
Q7. How many contributions to standards organizations have been submitted by project partners, stemming directly from project related activities? (Per Stream)



- Total contributions to standards organizations from the projects are 308.
- Stream B contributed highest to the standards with 219.
- Hexa-X-II (Stream B) is the highest contributing project by 103.

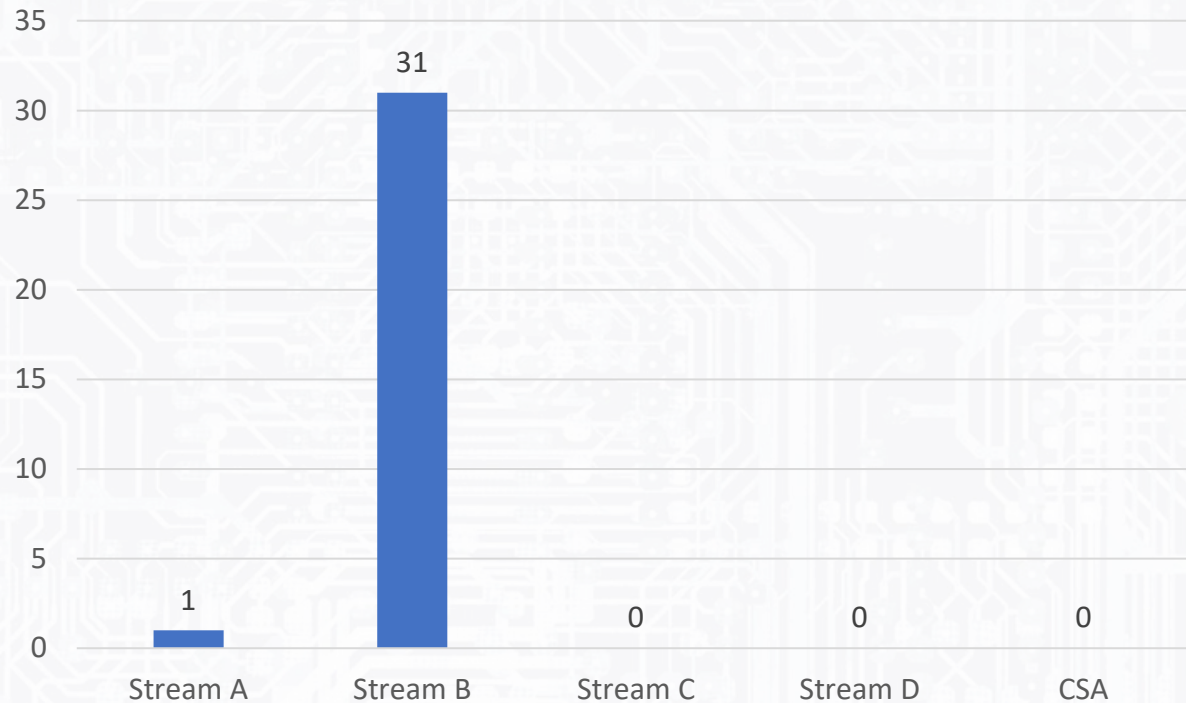
Q7. How many contributions to standards organizations have been submitted by project partners, stemming directly from project related activities? (Per Standardization Org)

Top 10 ranked standardization organizations that projects contributed to.



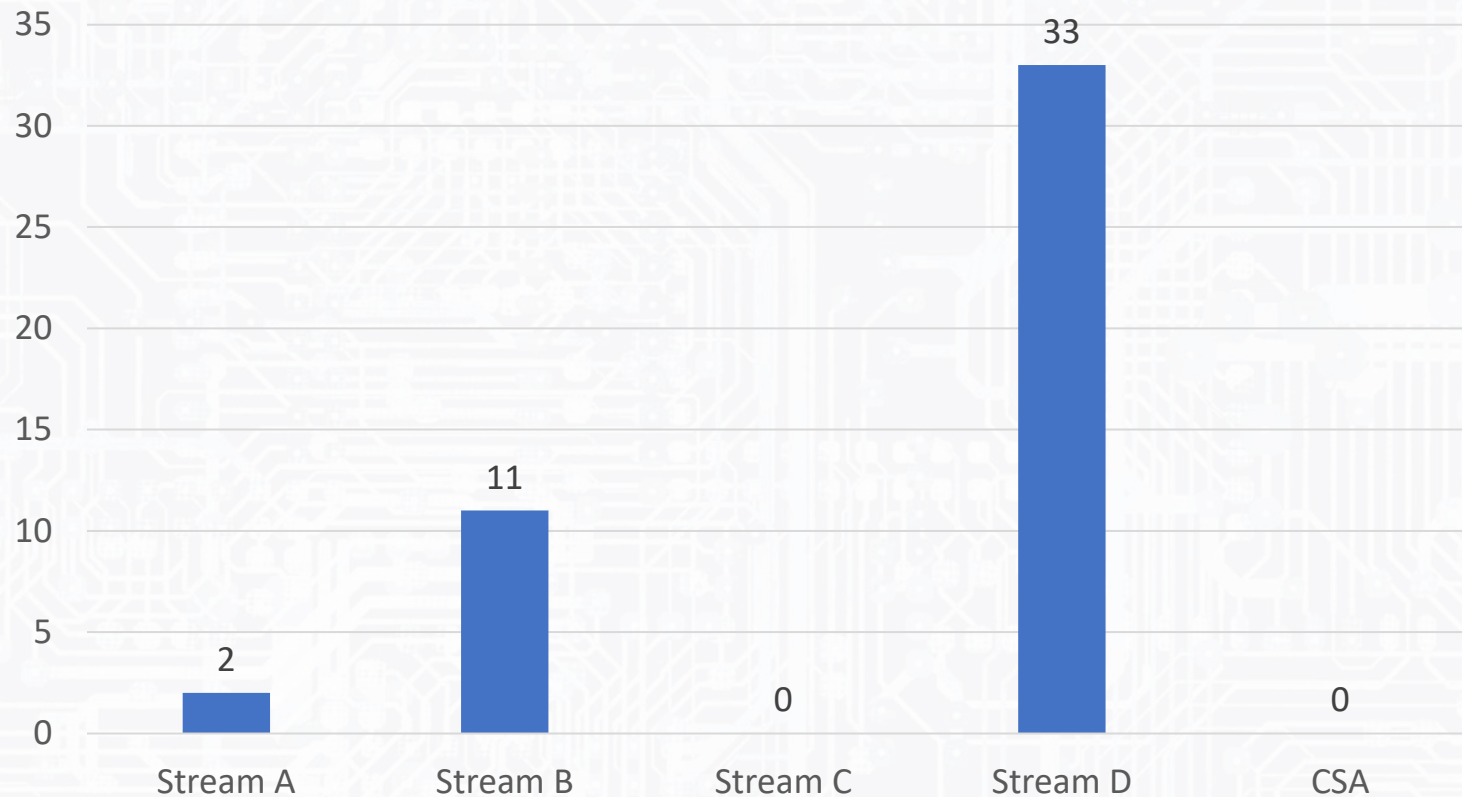
Standards organizations names

Q8. How many IPR (patent) applications, stemming directly from project related activities, have been submitted by project partners ?



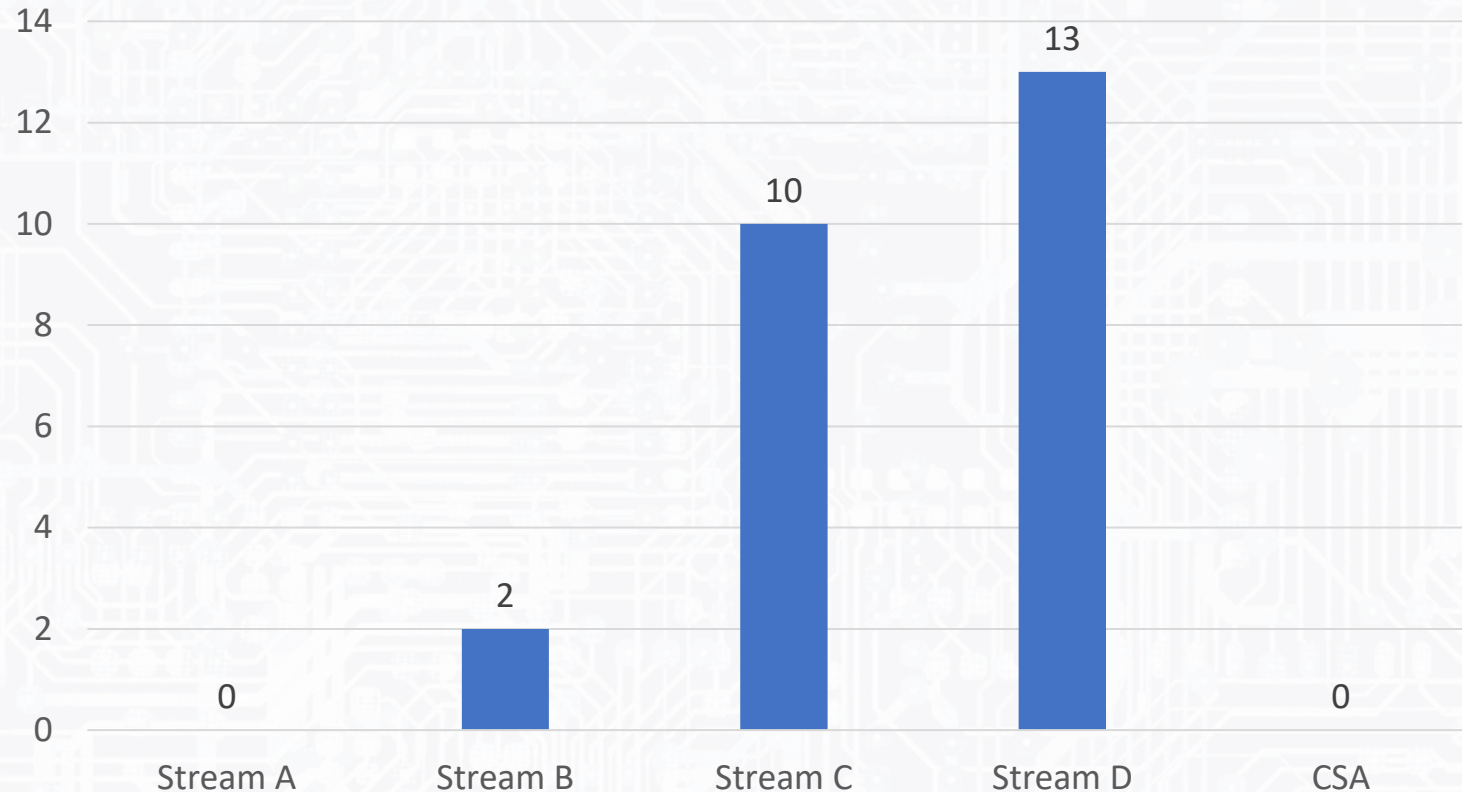
- Total IPR (patent) applications are 32.
- Majority of the IPR patent applications are coming from Stream B.
- CENTRIC (Stream B) project is the highest IPR (patent) submitting project with 14 IPR applications.

Q9. How many Proof of Concepts (PoCs) (TRL3) and/or Lab Tests (TRL4) has your project executed?



- Totally 46 Proof of Concepts (PoCs) (TRL3) and/or Lab Tests (TRL4) have been executed.
- Stream D is the highest contributor to Proof of Concepts (PoCs) (TRL3) and/or Lab Tests (TRL4) by 33.
- TrialsNet (Stream D) is the highest contributing project with 15 PoC/Lab tests.
- Projects that have commented mostly mentioned that this is an ongoing activity for their projects.

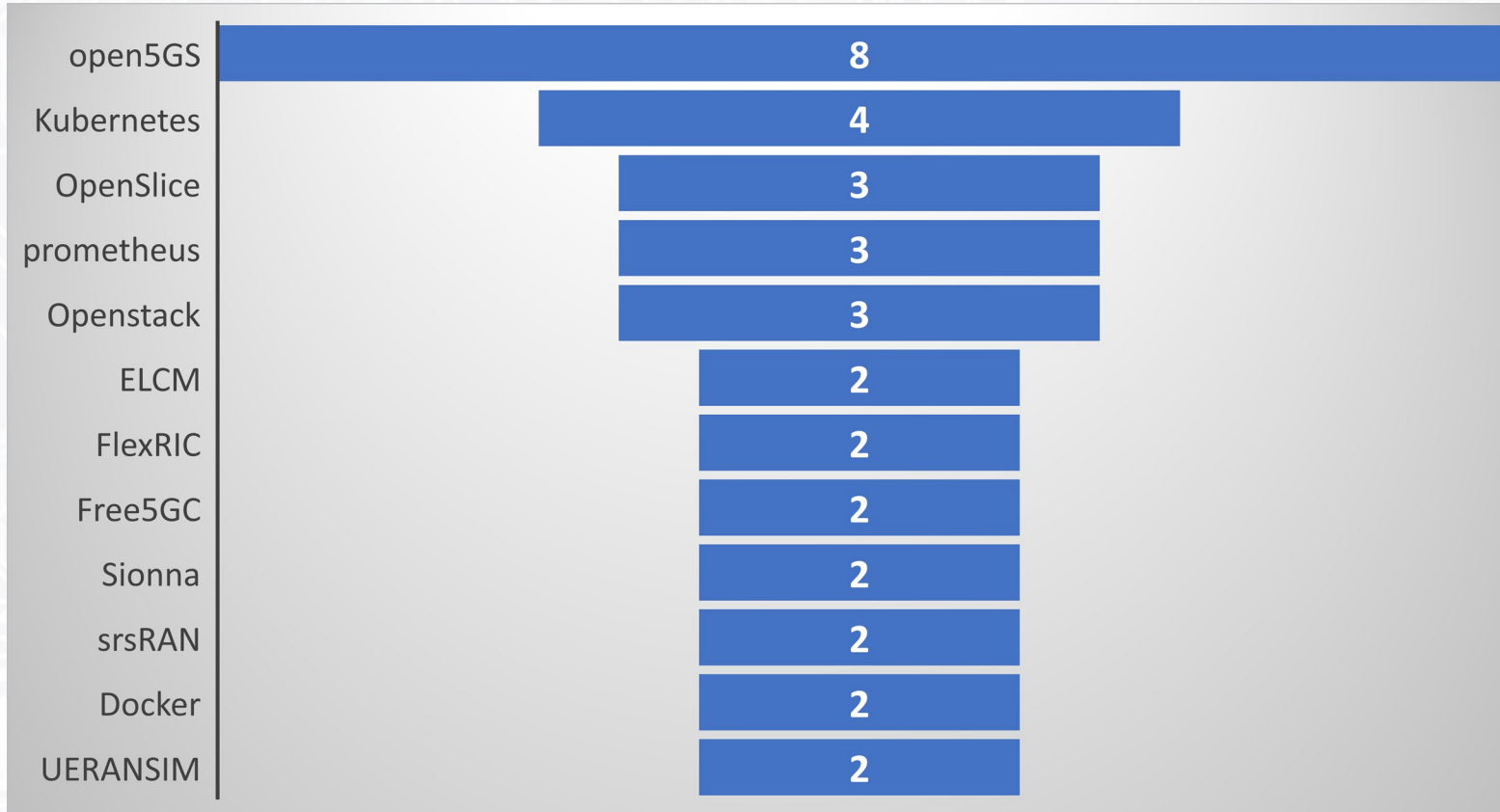
Q10. How many Trials (TRL5/6) or Pilots (TRL7) has your project executed?



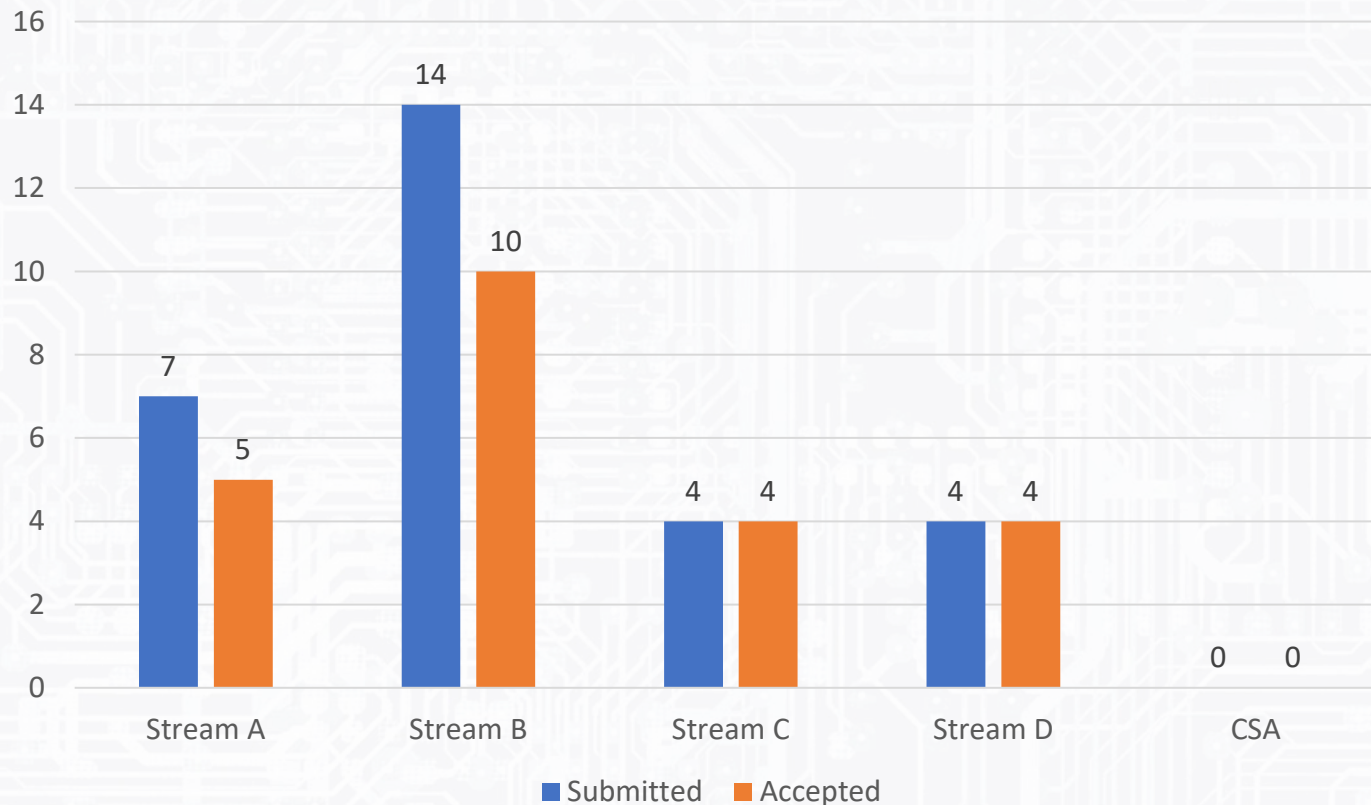
- Projects executed totally 25 trials and pilots.
- Stream D has executed highest trials / pilots with 13.
- 6G-SANDBOX (Stream C) has executed the highest number of trials / pilots by 10.
- Projects that have commented mostly mentioned that this is an early phase for their project to execute trials / pilots.

Q11. How many open-source solutions has your project made use of?

Top ranked open-source solutions that projects made use of.



Q12. How many open-source contributions has your project generated & submitted and how many were accepted in the relevant communities?



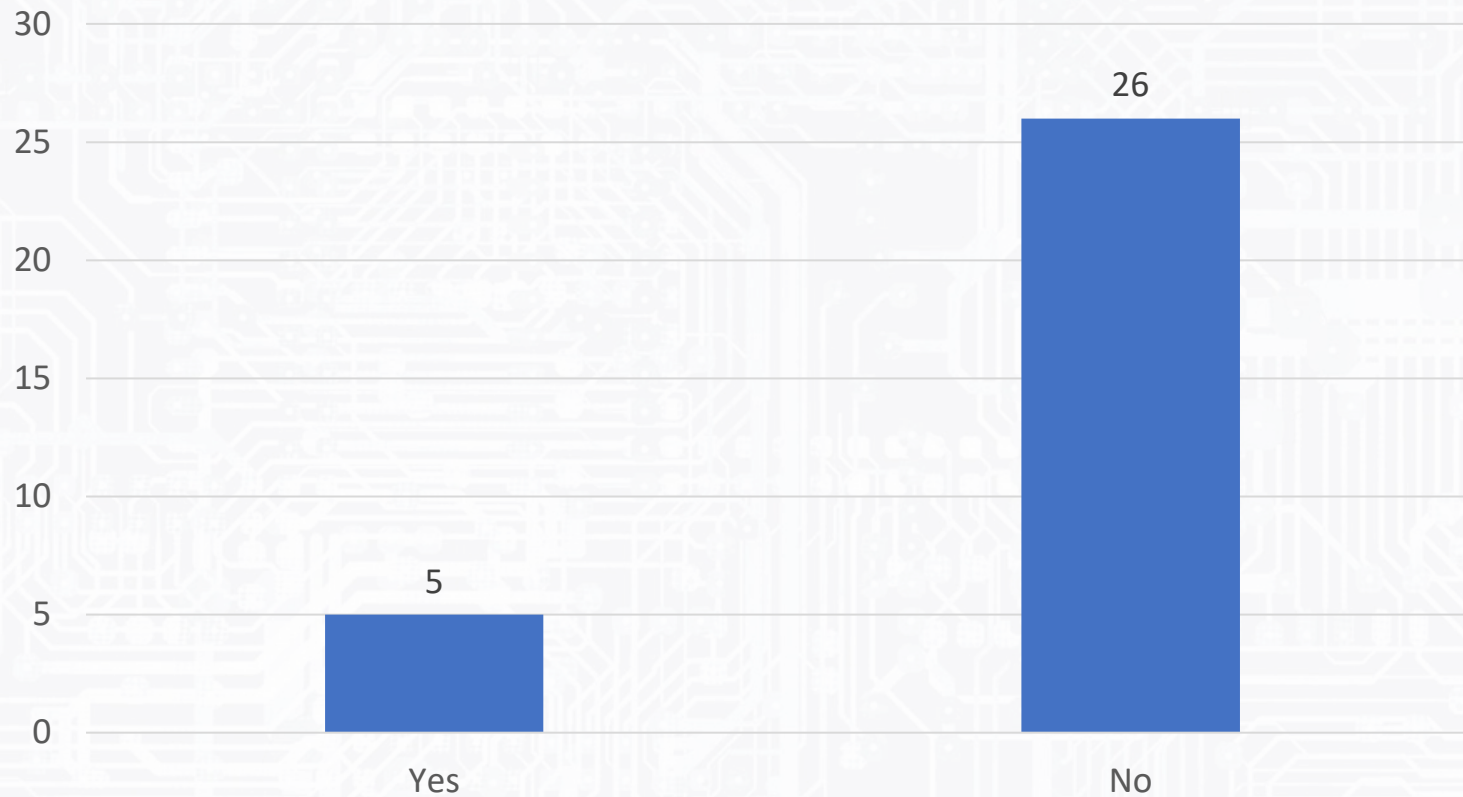
- In total, call 1 projects have submitted 29 open-source contributions and 23 of them has been accepted.
- Open-source contributions came mostly from Stream B with 14 contributions and also the highest accepted contributions came from Stream B with 10 contributions.
- SEASON (Stream A) is the project that has provided highest open-source contributions with 5 contributions and CENTRIC (Stream B) project has the highest accepted open-source contributions by 4 contributions.

Q12. How many open-source contributions has your project generated & submitted and how many were accepted in the relevant communities?



Open-source contributions that has projects generated & submitted

Q13. A) Has your project experimented with Energy Efficiency (EE) solutions?



- Only 5 projects have experimented with energy efficiency solutions.
- 26 projects have not stated their experiment with energy efficiency solutions.
- Some projects commented that they will have EE solutions: currently they run simulation studies, or measurements are pending, or it is expected in period 2 of the project.

Q14. High-risk research: What percentage (in terms of budget share) of activities in your project are at levels TRL 1 and 2, and therefore correspond to "high-risk" research?



Risk % in Terms of Budget Share	Project Number	Risk Topics
%0 - %25	7 Projects	Human-machine interfaces, quantum architecture, RF power transfer, zero-crossing modulation, enhancing radio protocols, mobility, intent-based management, security, intelligent radio design, energy-neutral protocols, defining use cases, requirements, and architectures for RIS and THz systems, developing cross-layer algorithms, energy-efficient network architectures, and security solutions.
%25 - %50	4 Projects	AI-driven management and orchestration frameworks, scalable and secure data sharing, energy-efficient AI models, network control frameworks, and the development of new transceivers, network protocols, security frameworks, and hybrid RAN/Core functions.
%50 - %75	4 Projects	Novel hardware solutions for ultra-high capacities with ultra-low power consumption, 6G architectures, wireless transmission, time synchronization, edge cloud solutions, and security-by-design, sub-THz systems, ultra-short transmissions, and RIS enhancements.
%75 - %100	-	-

Q15. What obstacles/ challenges did you face during your first year of operation? Were you able to overcome/resolve them?



Managerial obstacles/ challenges

- Human resource recruitment. Difficult to find qualified engineers in the B5G/6G and ethics expert in research area.
- Change in the Technical Management of the project
- Delays in deliverable completion due to internal discussions
- The management and organization of the first Open Calls for Stream D project.
- Since UK was not associated at the time, and they needed to apply for their government funding, that created some delays in certain activities.

Q15. What obstacles/ challenges did you face during your first year of operation? Were you able to overcome/resolve them?



Technical obstacles/ challenges

- Quantum-safe cryptographic algorithms have particular requirements in terms of computing and storage resources, as well as timing constraints.
- The integration of the various project components requires the identification of common interfaces and integration points.
- The applicability of some AI models in other environments/testbeds is limited.
- Achievement of high accuracy in modelling the Blockchain interactions through Markov chain approaches.
- Identification of the appropriate semantic communication techniques that fit in the scope of the project.
- Definition of the quantum key distribution simulator aspects to achieve high precision.
- Achieving good performance in terms of throughput for the in-lab 5G testbed.
- The complexity of the Photonic Integrated Chips implementing the transmitter and receiver modules.
- Subsystem fabrications issues/delays.
- Meaningful datasets for AI use, to be later openly published.
- Lack of hardware implementing baseline approaches
- The novel concepts with sub-THz over PMF and dual-frequency "tandem" approach, where many basic questions were essentially still open at the beginning of the project.
- The co-design of the communication system and transmission approach with innovative HW does create extra complications as they need to progress in parallel with inter-dependencies, and multiple technological disciplines need to establish models to ensure progress at different abstraction levels and find a common language.

6G SNS OPS

THANK YOU FOR YOUR ATTENTION



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Funded by the Horizon Europe research and innovation programme

THIS PROJECT
IS PART OF **6G SNS**
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