

CASE in Tools Hackathon Reflections (working title)

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INNOPOLIS
UNIVERSITY

**Thanks to the
team Maria,
Inna, Mansur,
Vladimir and
Sasha**



Hackathons in Education

CASE in Tools

Reflections and further steps

Outline

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CASE in Tools ...

Andrey's Background



- Experience

- Project Manager, Coordinator – 14 years

- Worked for

- SWsoft, AIRBUS, SOFTEAM

- Worked with

- European Space Agency
- Thalès, Scania, Volvo, Nokia, SAP, Bombardier, ATOS, IBM, SIEMENS, EDF

MSc MIPT

PhD AIRBUS / Sorbonne Uni.

MBA HEC Paris

- Areas of Interest

- Distributed Systems
- Model-driven Engineering applied ...
 - Software and services
 - Cyber-physical systems
- Digital Innovation

Professional life

- Biggest project: 20M€ / 20 Man Years
- Biggest team: 100+ people, 26 companies,
- Biggest challenge: juggling 6 projects at the same time + family.
- Biz Travels: 404 days, 26 countries, 90 cities





Hackathons in software engineering education – lessons learned from a decade of events

J. Porras, J. Khakurel, J. Ikonen, A. Happonen, A. Knutas, A. Herala, and O. Drögehorn.

In Proceedings of ACM ICSE conference, Gothenburg, Sweden, 2018

DOI: 10.1145/3194779.3194783

What is a Hackathon?



hackathon

NOUN

informal

An event, typically lasting several days, in which a large number of people meet to engage in collaborative computer programming.


‘a series of 48-hour hackathons to build new web and mobile services’

+ More example sentences

Origin

1990s: from hack, on the pattern of marathon.

Pronunciation

hackathon /'hakəθɒn/ 

Why hackathons in education? Soft skills, engagement

- Team work
- Leadership
- Communication
- Management of Expectations
- Requirements Management
- End-user awareness
- Creativity
- Presentation skills
- Business domain knowledge
- Critical thinking, justification
- Quick learning

Some history

1999

- Open innovation, Inter-disciplinary teams, Foster creativity

2003

- Students code camps, 24-hours events, New technologies by companies, Recruitment

2007

- Week long code camps

2010

- Industry hacks, Crowdsourcing, Business-oriented, Startups.

Basic taxonomy

Hackathon	Aims	Stakeholders	Outcomes
24-hour	Fast intro to new topics (e.g. those not available in current curricula). Learning by doing.	Universities, students, companies	Implementation, improved skills, new knowledge, fast prototypes
Week-long	Understanding the workings of selected topic. Learning by doing.	Universities, students, companies	Deep knowledge and skills of the event theme, working prototypes
Team building (Freshmen)	Bonding and acquaintance. A good start on studies.	Universities, students	Understanding of own strengths and weaknesses in programming.
Specialization	Getting a glimpse of multiple different technologies.	Universities, students, citizens	Technology and operability knowledge
Hack as an exam	Testing skills in a real project environment.	Universities, students	Knowledge of the skills each student has
Competition	Innovating solutions to a given challenge and first implementation. Emphasizing innovativeness.	Students, mentors	Skill to work with a real-world challenge, innovation capabilities, implementation, competition entry
Industry hack	Working and providing solution to a company-defined theme.	Companies, students	Ability to work on a real-world challenge and operation environment

Benefits and Challenges

- Extend core content without overstressing the curriculum
- Evaluate skills in real environment
- Teach soft skills in real settings
- **Intensify stakeholder collaboration**
- Fast track in studies
- Appreciation and recognition
- Hiring perspectives
- **Product development, crowdsourcing**

- Additional effort on faculty
- Participant's health
- Study-life balance
- Free-rider problem
- Uncertain outcome for companies



CASE in Tools

Origins – Managing Software Development

©David Root, Eduardo Miranda

- People Management
- Processes
- Planning

- Case Studies
- Group work
- Tons of writing

- Exhausting workload
 - 51.5 front hours / 22.5 hs
 - Up to 20 hours / week home work

- Masters in Software Engineering
 - 1+ years of experience in industry
- Masters in Data Science
 - No experience requirements

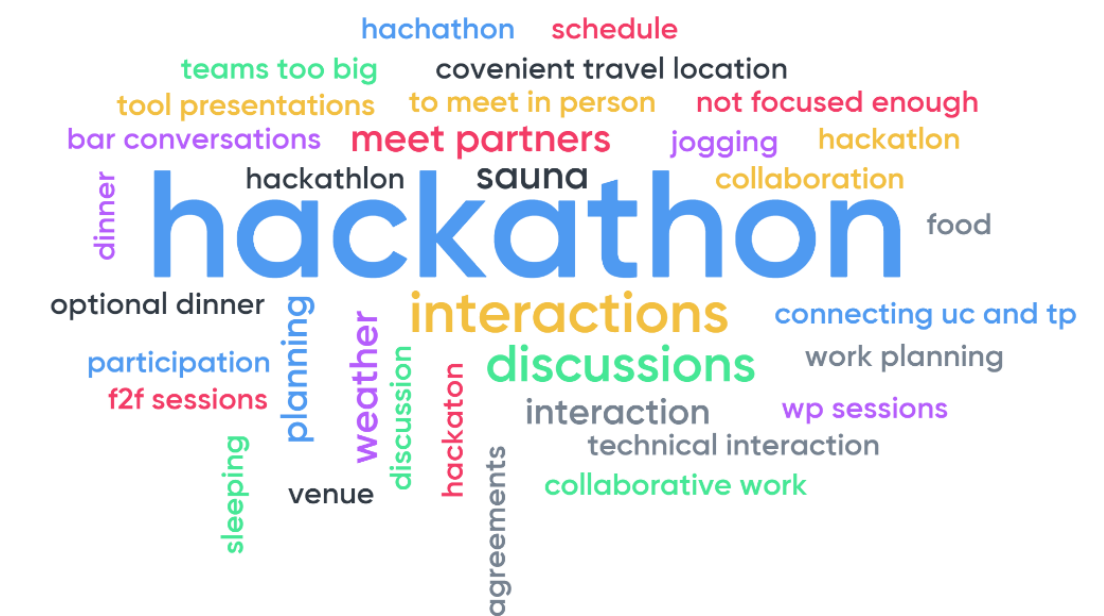
- Challenges
 - Students lacking experience
 - Motivating
 - Conveying relevance
 - Real-life practice

Origins. Hackathons in Research Projects

A. Sadovykh et al., “On the Use of Hackathons to Enhance Collaboration in Large Collaborative Projects : - A Preliminary Case Study of the MegaM@Rt2 EU Project -” 2019 Design, Automation & Test in Europe Conference & Exhibition (DATE). 2019.

- Replacement to workshops
- Limited to 8 working hours
- Extensive preparation, remote homework
- Diverse challenges
- Teams include “customers”
- “Safe” and motivating environment
- “Home” internal competition
- On-line and fun voting among teams
- Frugal design

the best thing with the plenary?



Overall successful.

CASE in Tools ...

Design for Education Purposes

■ Goals

- Expose to business domains
- Force soft skills development
- Maximize communication with real “customers”
- Expose to modern challenges in Soft. Engineering
- Maximize benefits to “customers”
- Re-enforce communication Faculty-Industry

■ Constraints

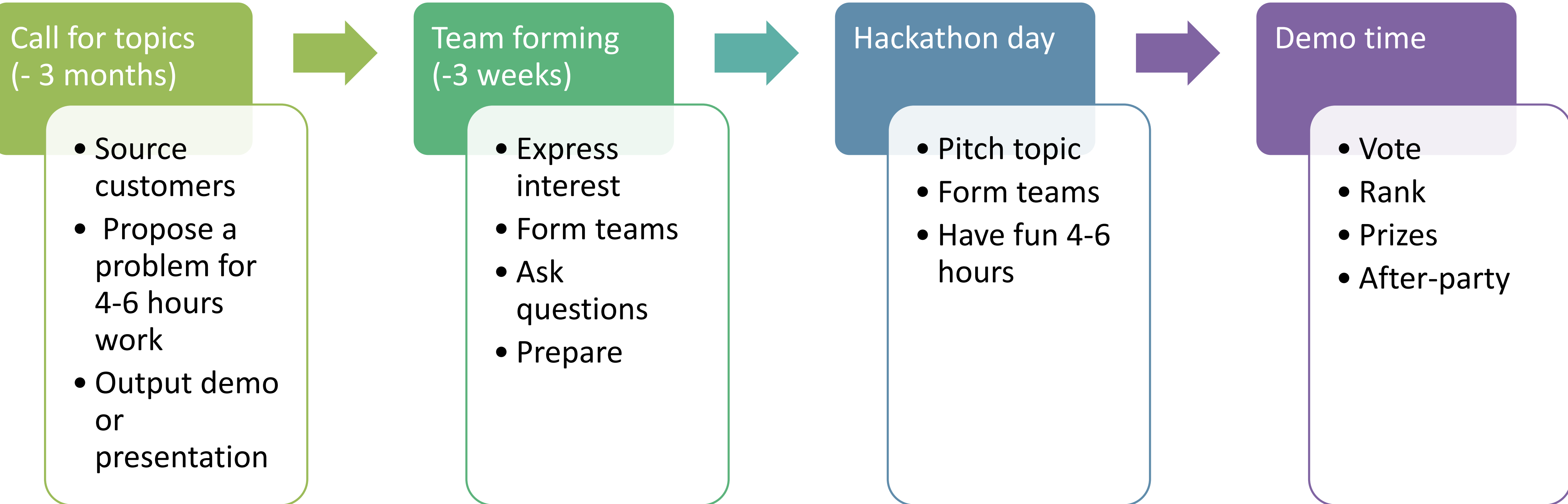
- Study/work – life balance
- Limited admin resources

■ Design

- Scope
 - Tool and methods in Soft. Engineering
 - Final result = presentation. Show business motivation, tech contribution, future collaboration
 - Customer is a part of the team
 - Entertainment is the necessary part of the event
- 8 hours working day even
 - Good for students, companies, organizers
- Home work
 - Contact “customer” and “mentor”
 - Re-define the scope
 - Do as much as you can before
- Frugal admin organization
 - sharing admin resources with Tools 50+1 conference
 - basics for working space, breaks, lunch
 - low equipment requirements

Educational “Hackathon” process

- Stakeholders – all in each team
 - Customers - proposes topic, expert knowledge on the business domain
 - Students – driving force
 - Mentors – expert in the area, observer role



Sourcing paying customers (-3 months)

- Direct connections
 - Mailing to IU network
 - Interviews
 - Polling on benefits
 - Explaining the process and organization
 - Defining feasible scope
 - Following up
- 8 customers found
 - Direct connections worked only
 - Difficult to convey benefits to customers
 - No reply to cold mails
 - Scoping worked fine
 - Required 1-3 hours per customer
 - Results published at the web-site

Topics published (-3 weeks)

- Product Lines Engineering in Application
- Analysis of Enterprise Architecture Models
- Quality Analysis of Requirements
- Trace and Routing Optimization for HW design
- Continuous Integration of HW/SW systems
- Reverse Engineering Tools Usability
- API Usability
- Prediction of cloud resources utilization for optimal deployment
- Metrics and Dashboards for Mangement



REVaMP²



Acronis

SOFTEAM GROUP



Team forming and home work (-2 weeks)

- Students expressed their interest – 1st, 2^d, 3rd choice
 - Organizers selected teams
 - Organizers pulled IU mentors in related areas
 - Organizers connected teams
 - 4 Customers proposed related tutorials
- 34/44 students joined the event
 - Extra grade help to pull attention
 - Manual balancing of teams
 - 1 company disappeared at the moment of payment
 - Mentors pulling “almost” didn’t work
 - Tracking was required
 - Contacted customer?
 - Had interview with customer?
 - Had meeting with mentor?
 - Deployed infrastructure need for the hack?
 - Low mentor involvement

Day H Plan

Time	Session	Lead	Duration
9:00	Morning coffee, and warm up.	organizers	0:20
9:20	Welcome and organizational intro	organizers	0:10
9:30	Case challenges - pitches	customers	1:00
10:30	Coffee break		0:15
10:45	Hackathon part 1	Teams	1:45
12:30	Lunch		1:00
13:30	Hackathon part 2	Teams	2:15
15:45	Coffee break		0:15
16:00	Presentations, voting and award ceremony	orgs+teams	1:00
17:00	End of the day		

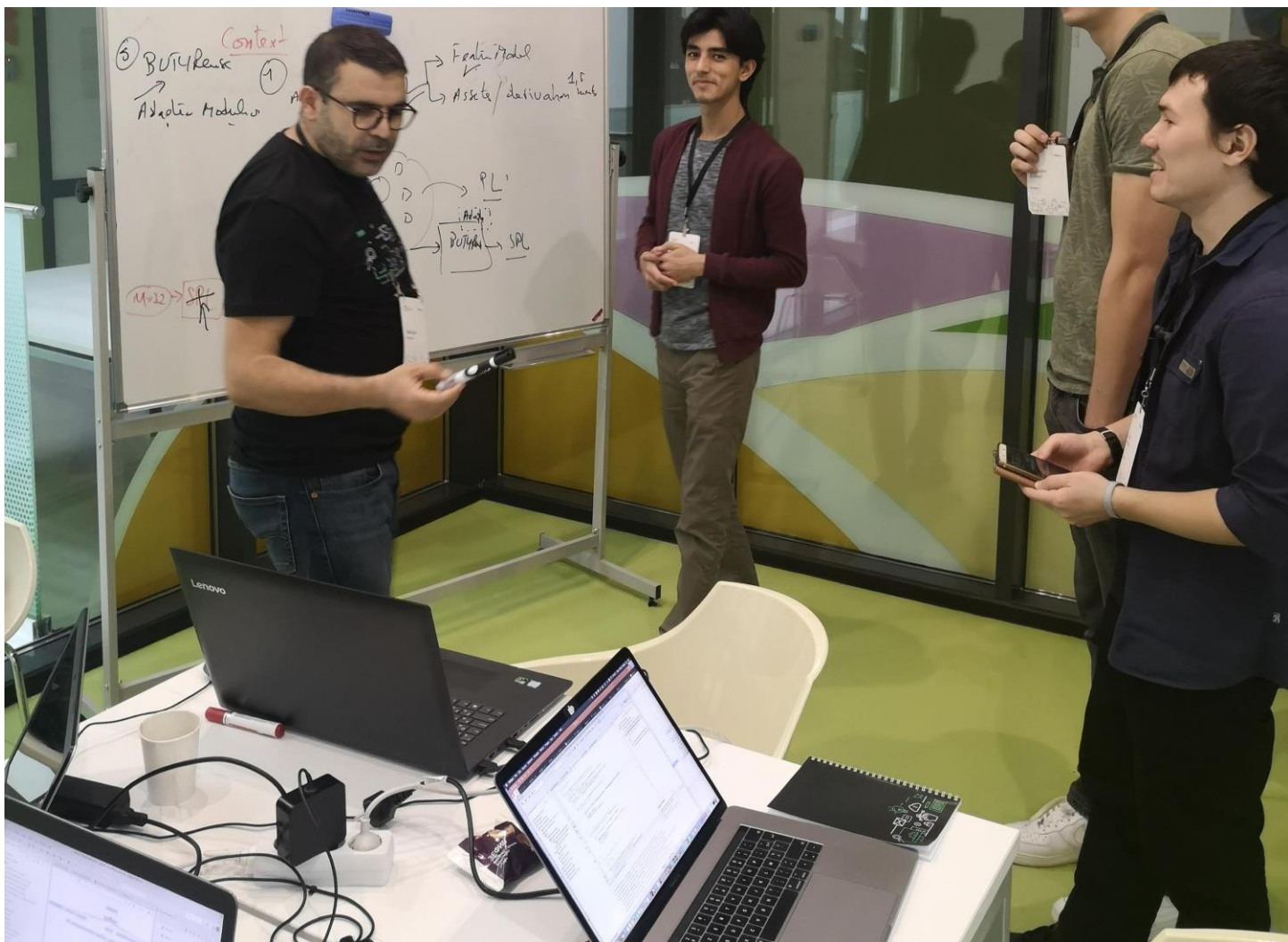
Day H (plan)

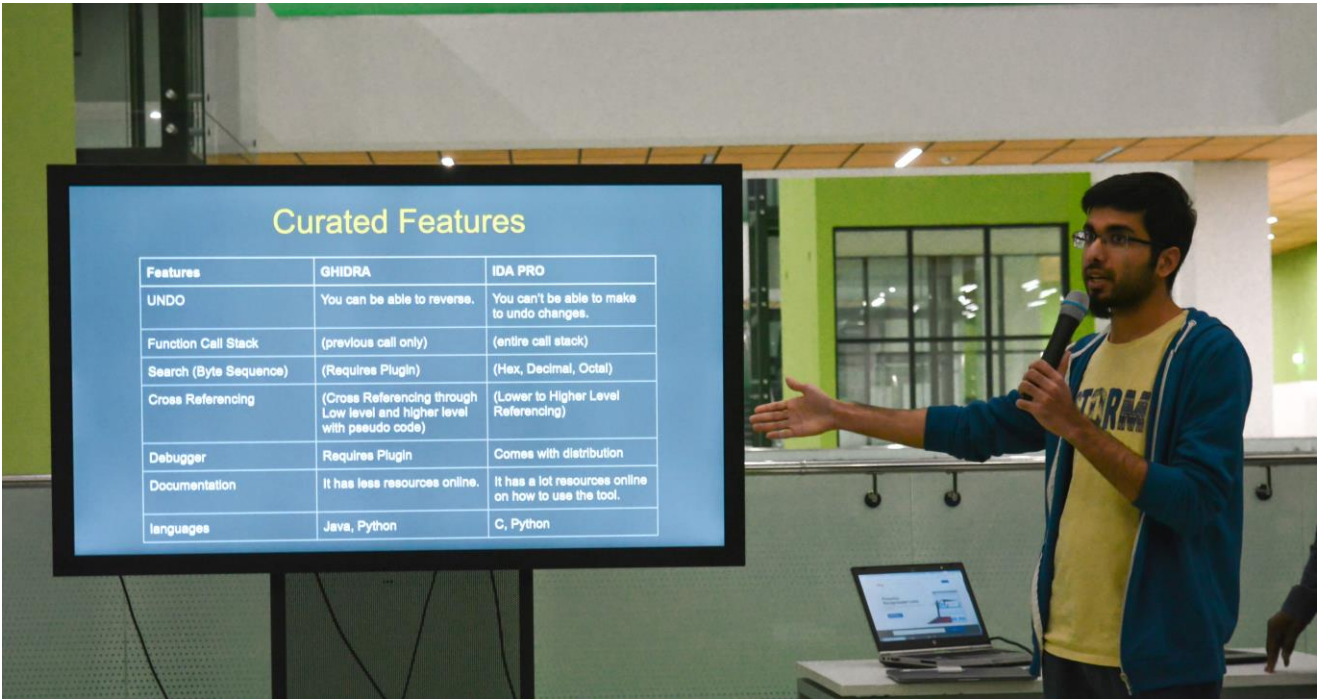
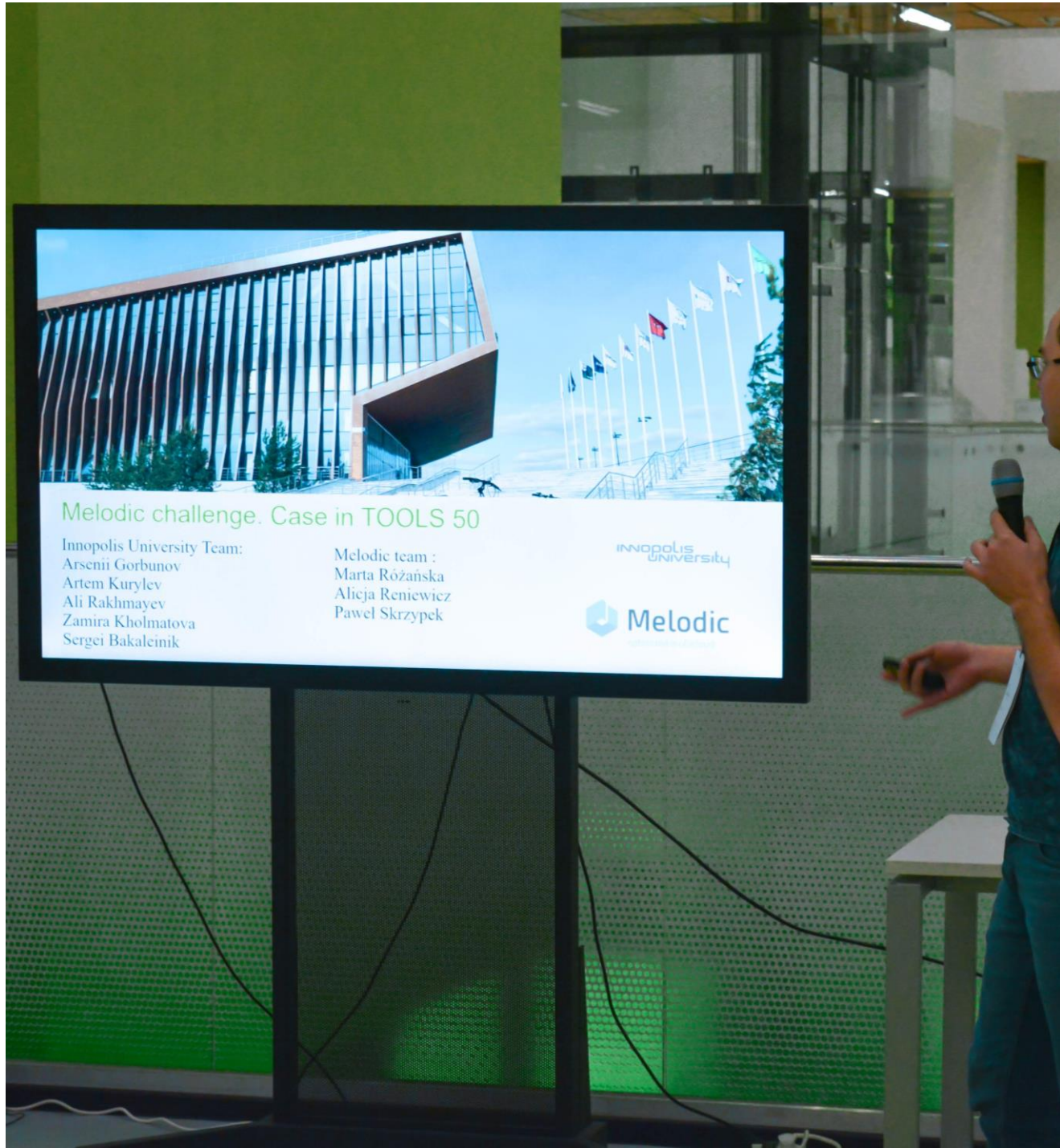
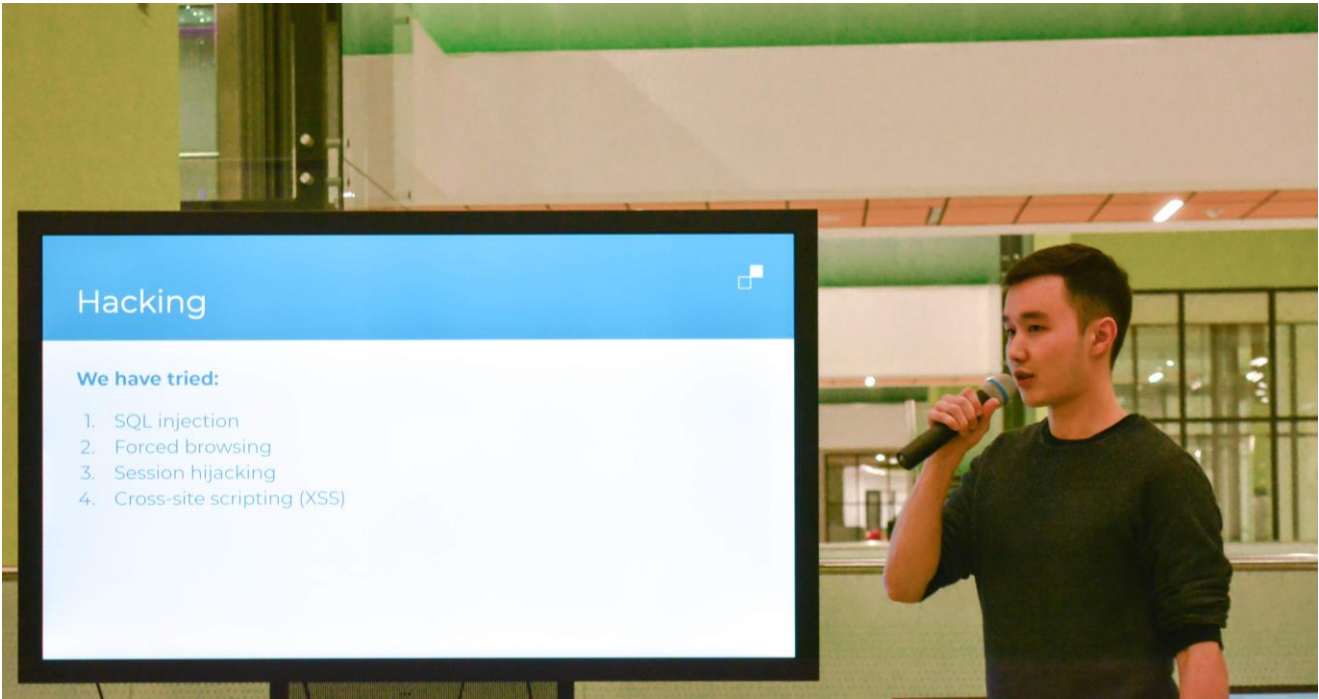




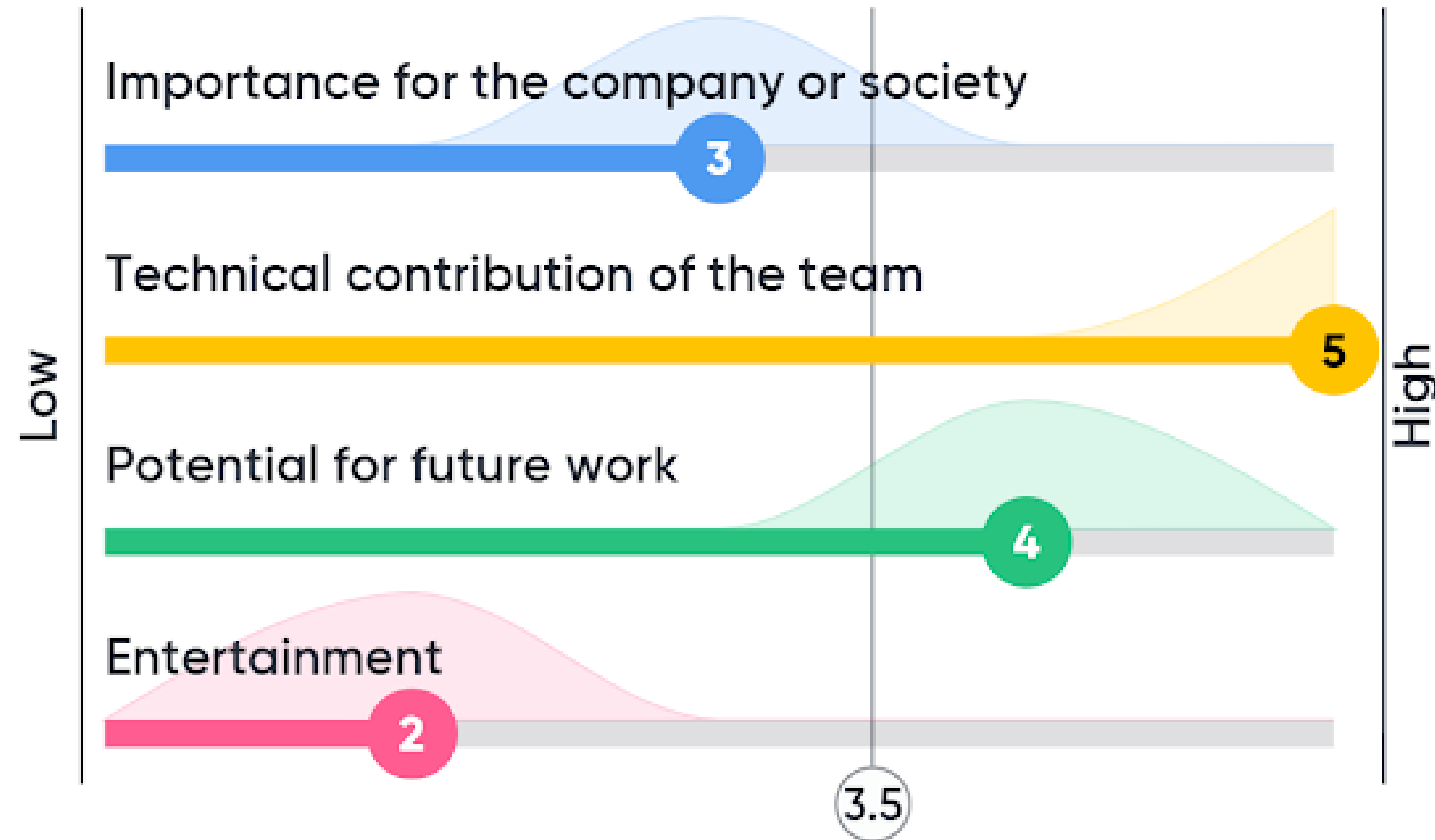


Team work





Final presentations



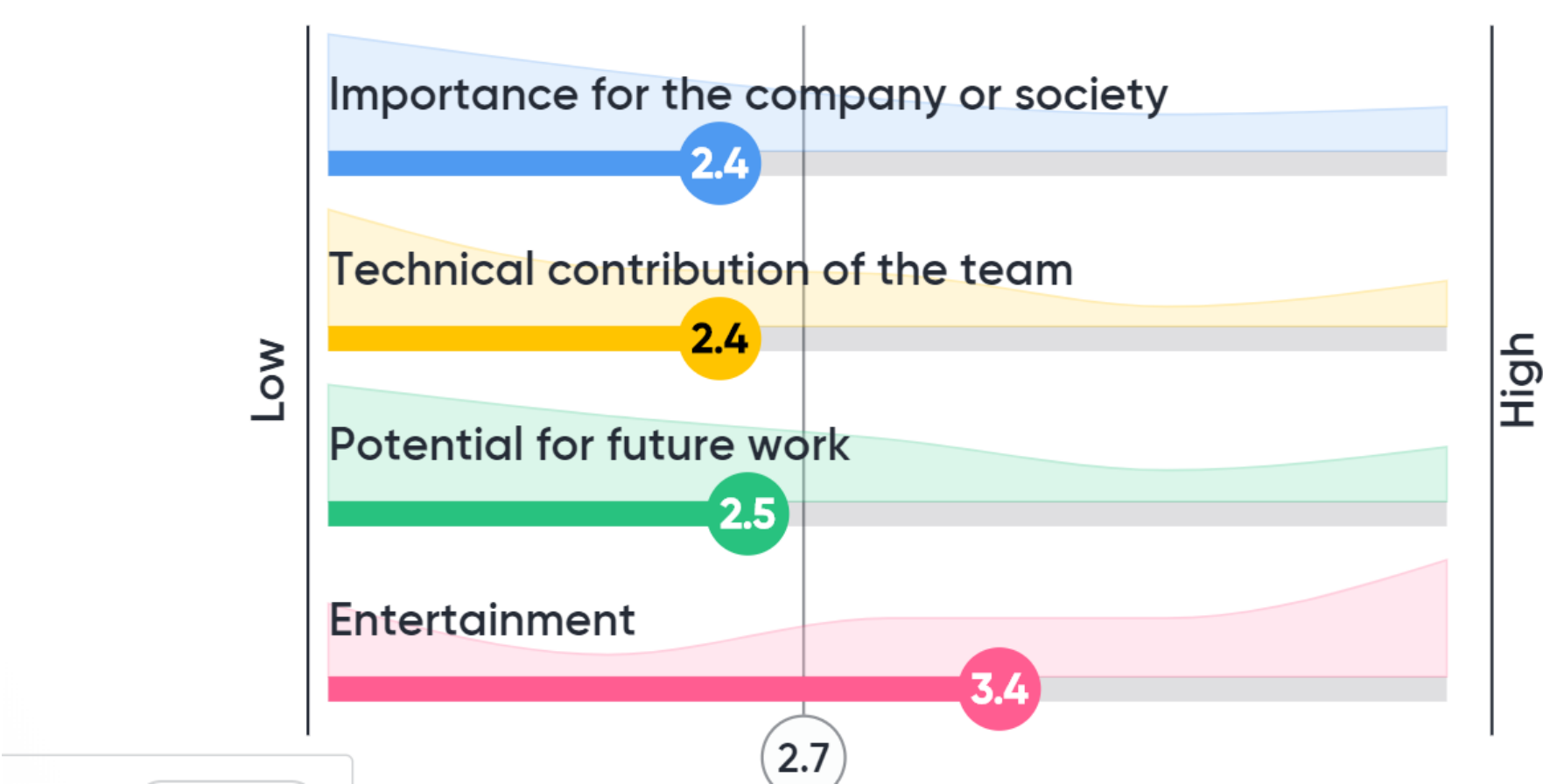
Voting

- Importance of the topic for the company or/and society
- Technical contribution of the team towards the objectives of the challenge
- Potential for the future work based on the results of the hackathon
- Overall entertainment level of the final presentation
- The team with the **best average score win.**

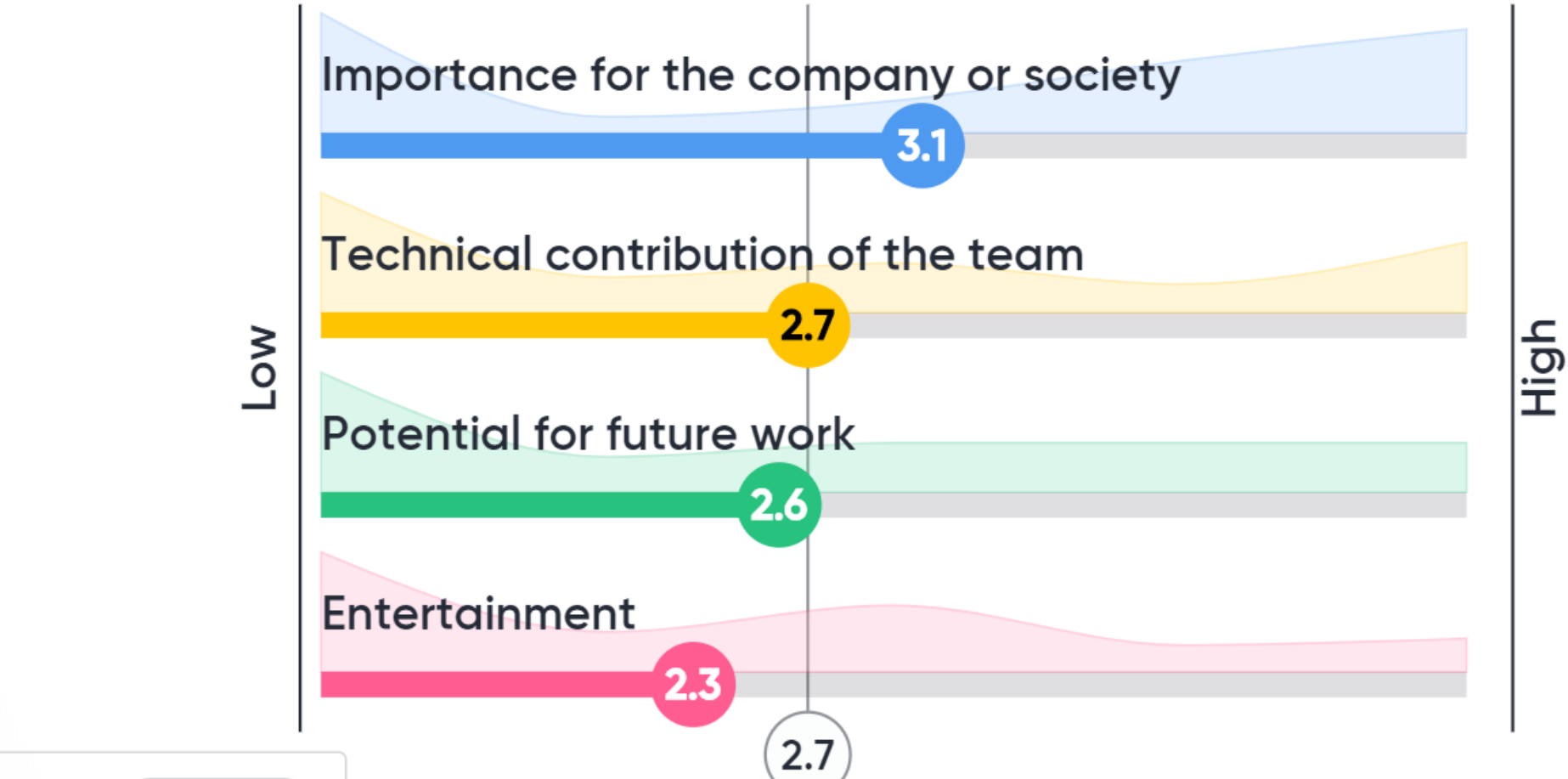


Voting

Reverse Engineering



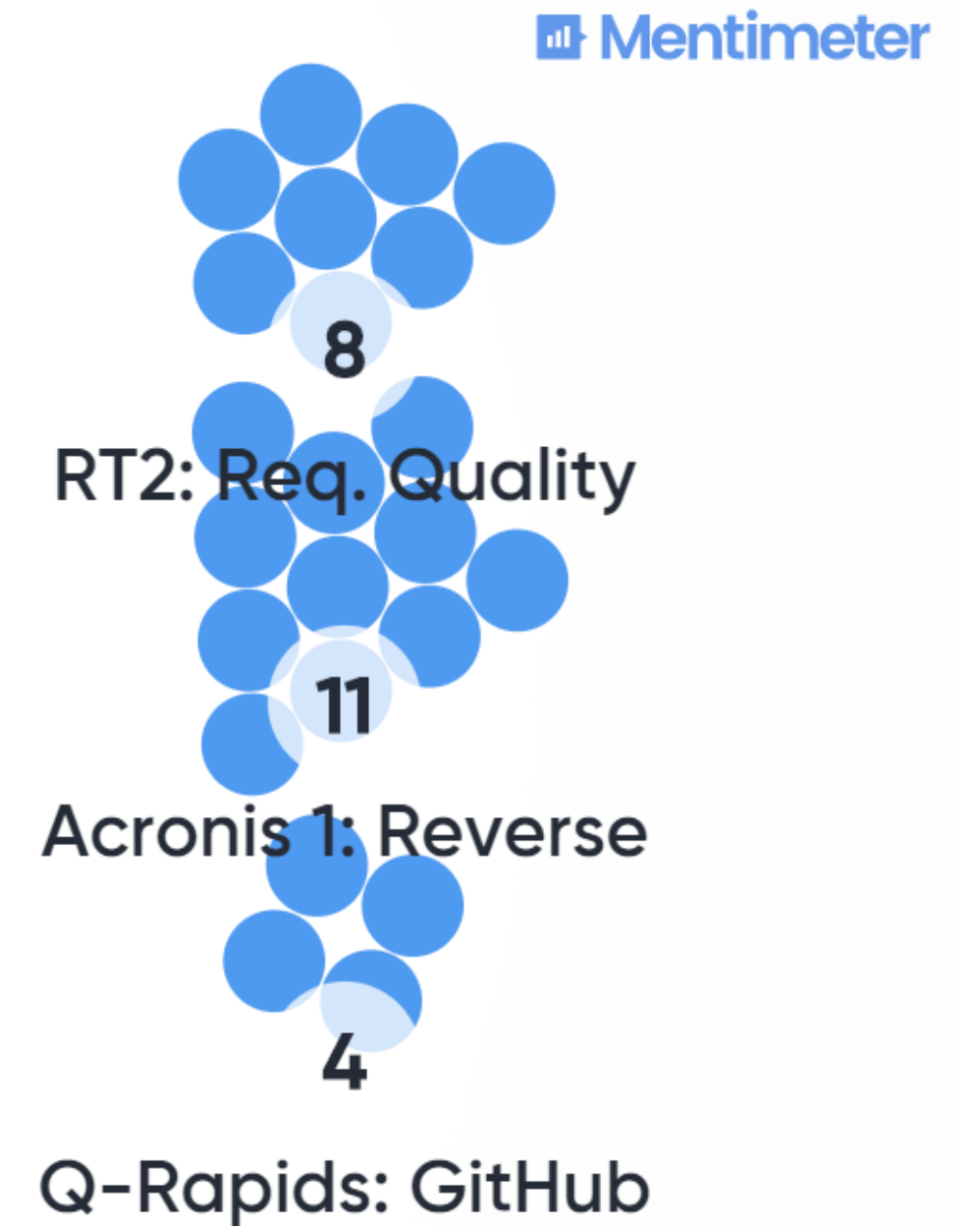
API usability




Tie case

Tie case, audience favorite vote

Multiple Choice



 Voting is closed [Open voting](#)

 64



Award ceremony and after party



Reflections

Challenges

1. Sourcing customers
2. Communicating benefits
3. Defining the scope
4. Remote customers
5. Admin effort
6. Equipment problems
7. Final presentation took too much of time
8. Cross fertilization among teams was very limited (= non-existent)
9. Voting procedure was unclear
10. Scalability concerns

Meeting the expectations

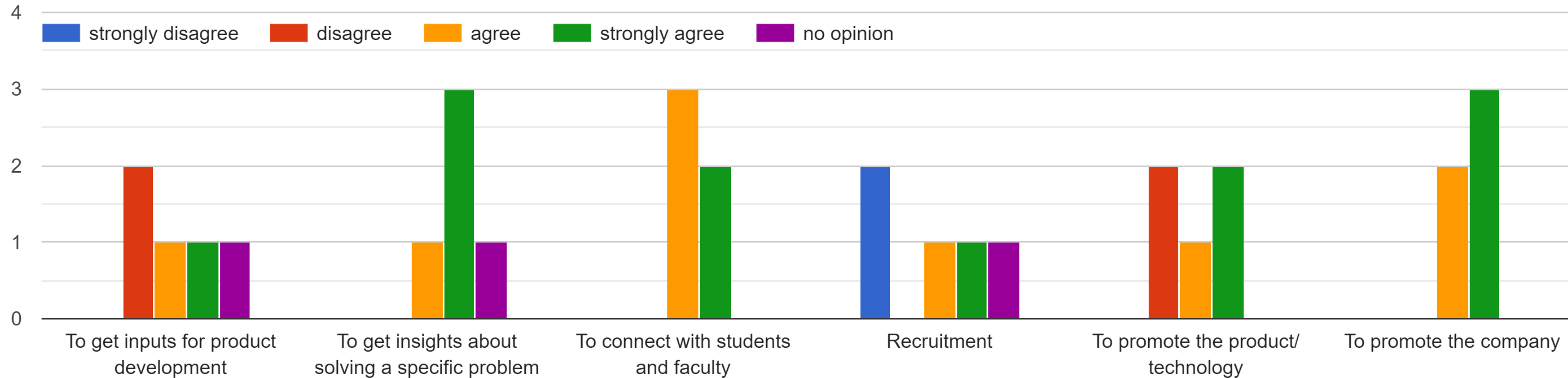
- Expose to business domains
- Force soft skills development
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Unintended results

Students attend the main conference
Students attend workshops and tutorial

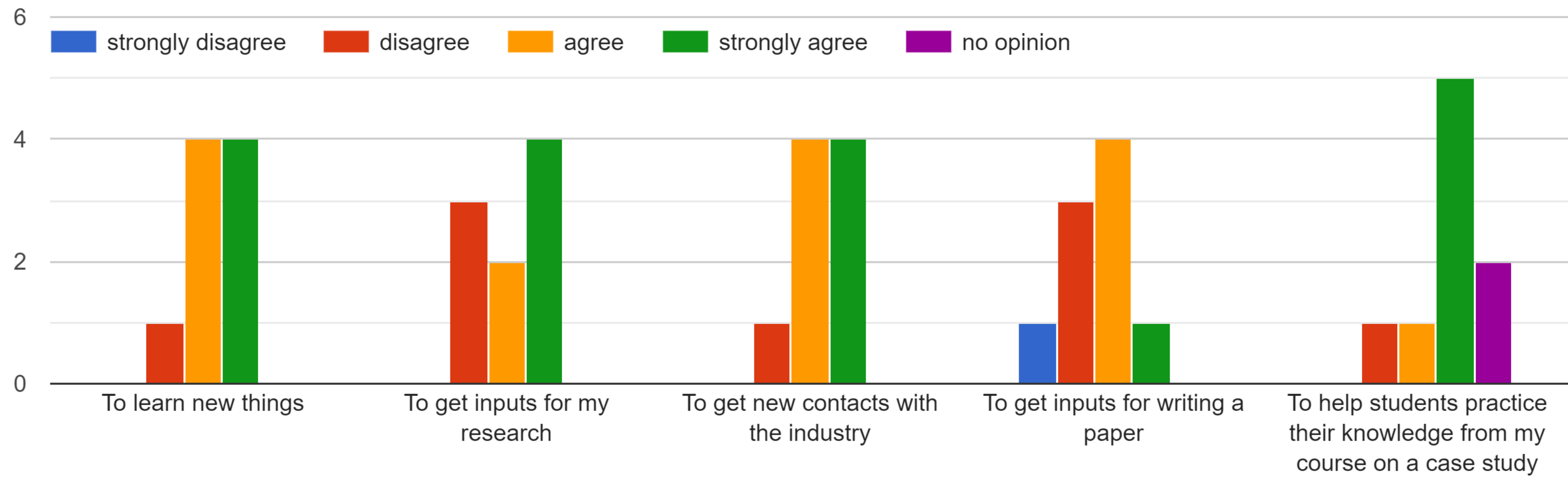
Customers (5/7) - highlights on INITIAL expectations

What were your INITIAL expectations from the event?



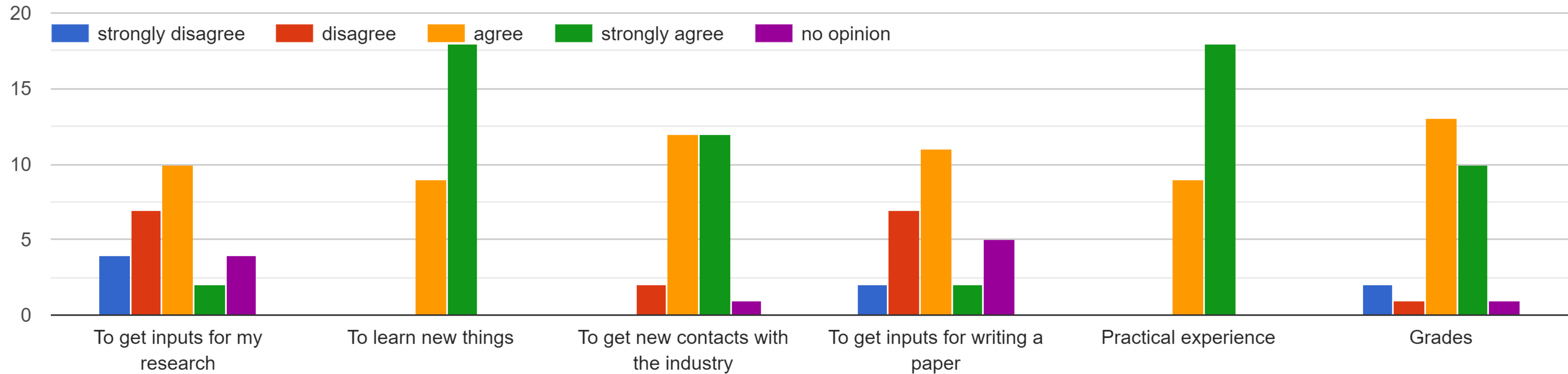
Researchers (9) - highlights on INITIAL expectations

What were your INITIAL expectations from the event?



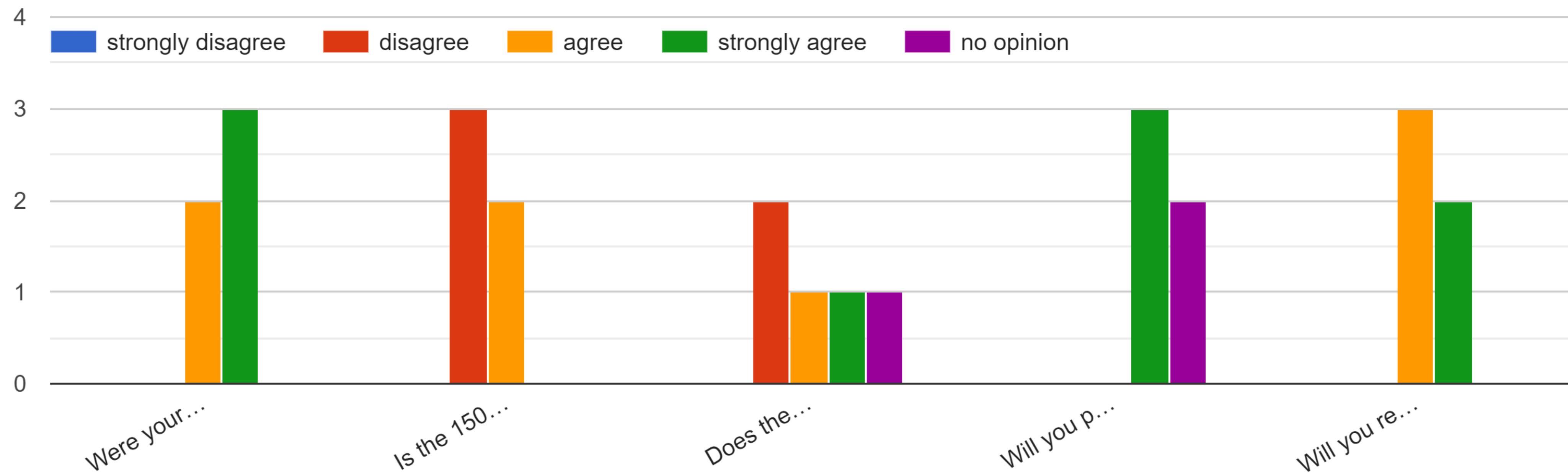
Students (27) - highlights on INITIAL expectations

What were your INITIAL expectations from the event?



Customers - highlights on OUTCOMES

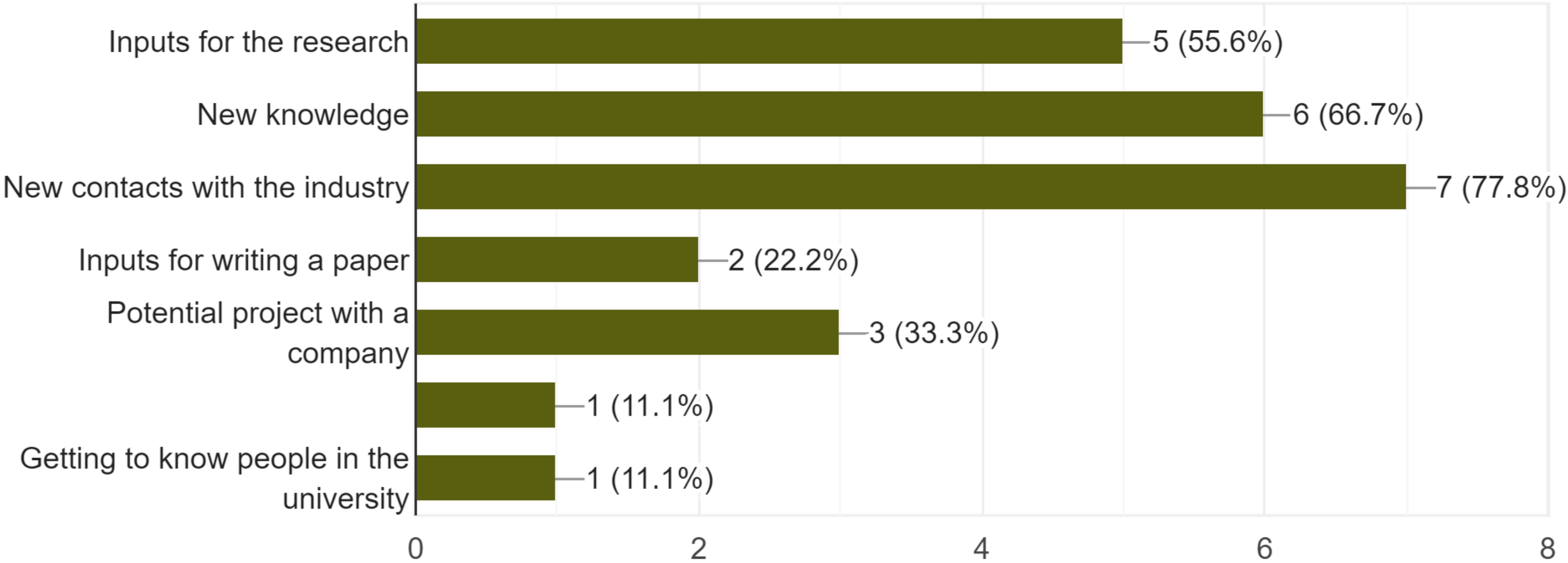
Were you satisfied with the event?



Researchers - highlights on OUTCOMES

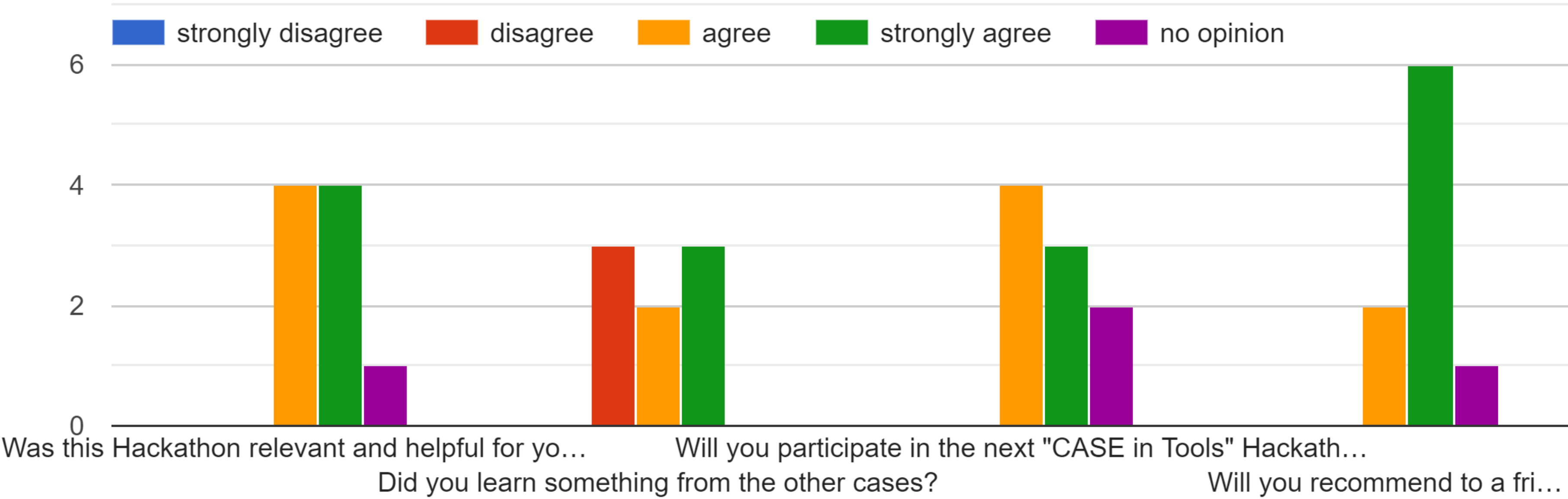
What are the outcomes for you from the event?

9 responses



Researchers - highlights on OUTCOMES

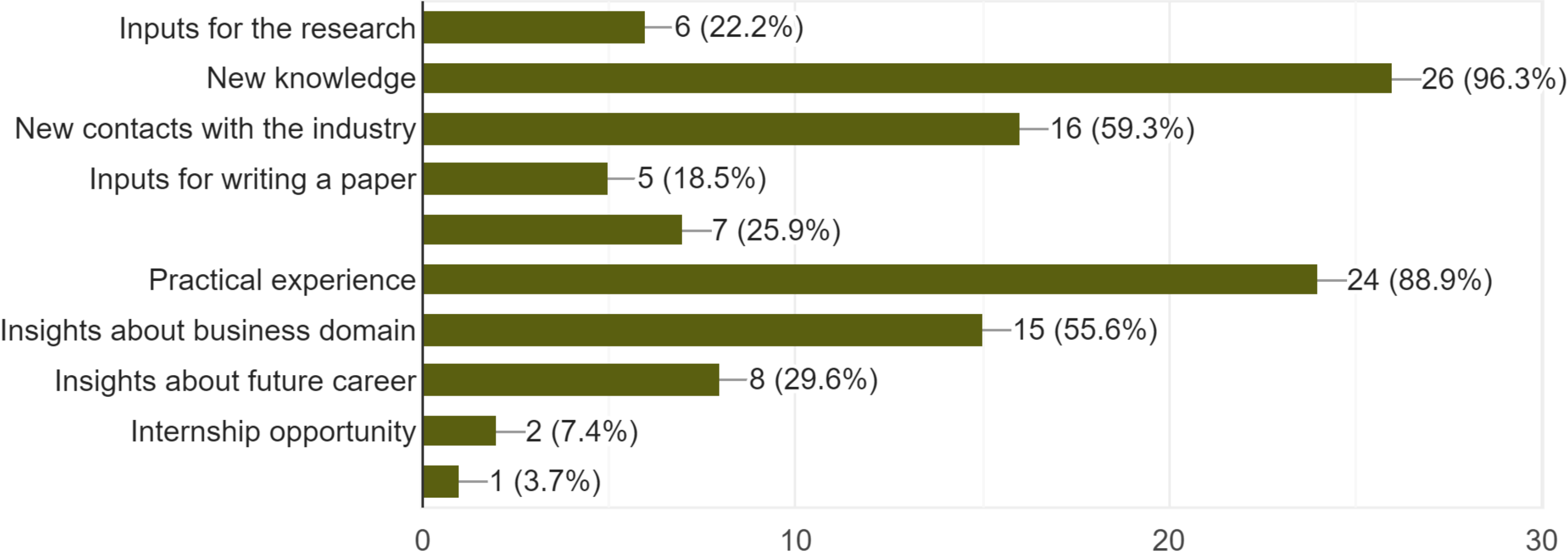
Were you satisfied with the event?



Students - highlights on OUTCOMES

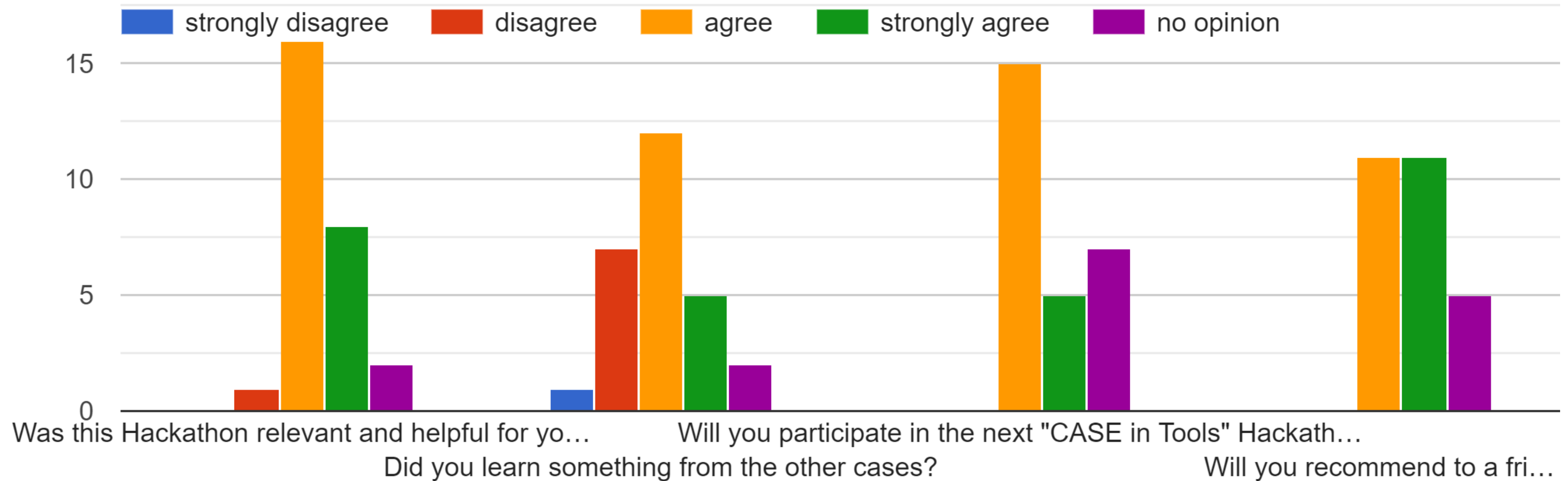
What are the outcomes for you from the event?

27 responses



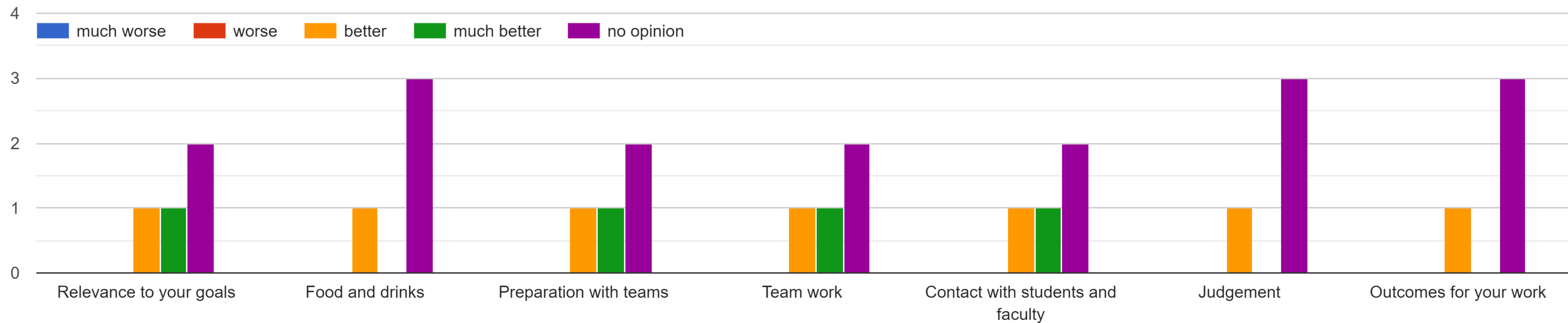
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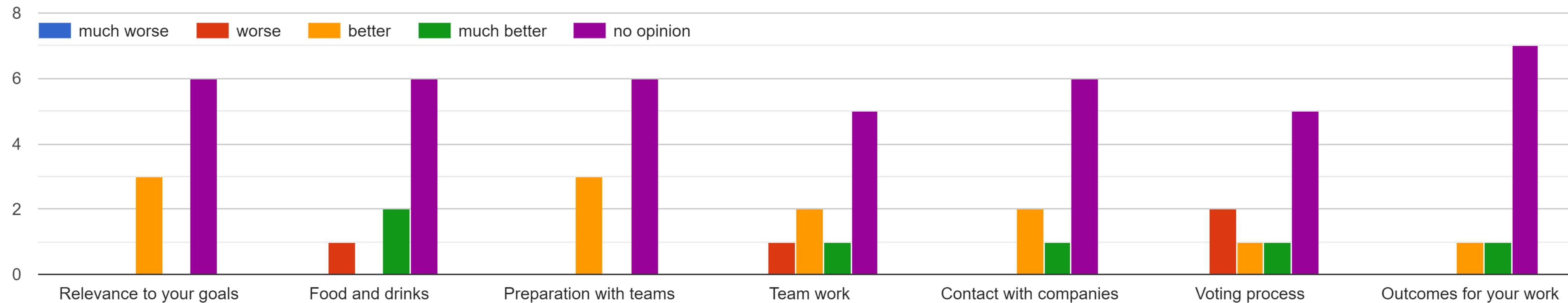
Customers. How do we differ from other Hackathons?

If you participated in other Hackathons, tell us how CASE in Tools differs.



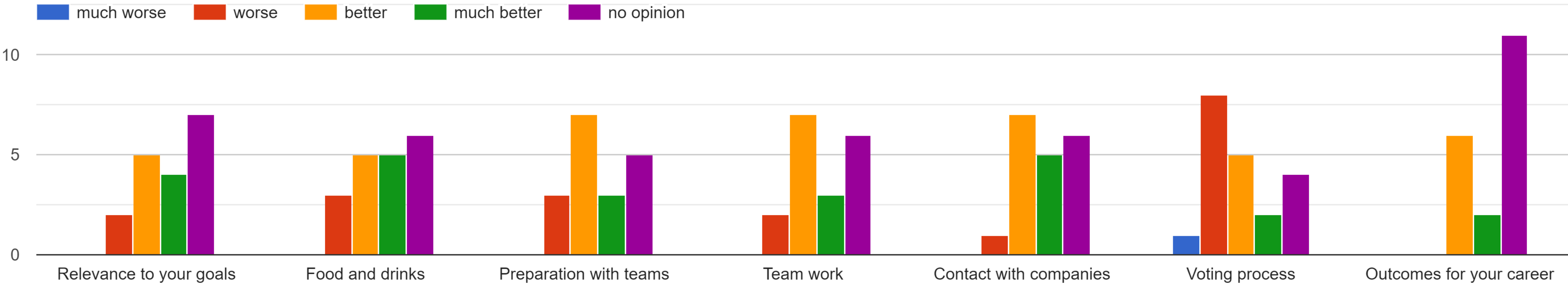
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Students. How do we differ from other Hackathons?

If you participated in other Hackathons, tell us how CASE in Tools differs.



What is next?

- Further post-mortem analysis
- Hackathon at MSD next year
- Extending Hackathon to
Software Quality and Reliability
course
- Checking quality of open source
software used by customers

- Hopes and dreams
 - Easier sourcing of customers
 - Easier admin organization
 - Thorough planning for educational
experiment
 - Follow up research projects with
industry

QU Hack: Quality In Use Hackathon

■ Cases from industry

- Analyse the quality of the open-source software package from a company
- Use any appropriate techniques: Quality Model, Metrics, Static Analysis, Dynamic Analysis, Process Quality, etc.
- Prepare presentation to convince the customer about the overall quality of the software package.

■ See QU Hack

<https://www.qualityinuse.info/finals>

<https://www.qualityinuse.info/2020/finals>

■ Evaluation

- Quality model appropriateness
- Soundness of analysis
- Nb of techniques applied
- Level of presentation / Team work











Thanks and come with us ...

More References

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