

Machine learning for optimizing university campus room stock

Problem



Do you use Innopolis University dorms? If yes, than, answer a couple of questions:

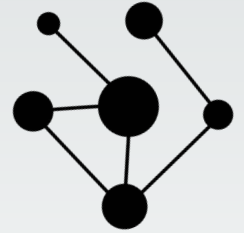
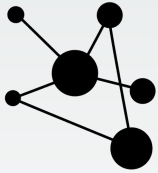
- Was your **check-in** convenient?
- How quickly did you establish **contact** with your roommates?
- Have you ever woken up from a **loud** roommate?
- Have you ever climbed through mountains of **trash** left by a roommate?
- **Are you happy with your roommate at all?**

We are here to fix all that

How is it solved now?



There are no ready-to-use solutions on the market that will allow you to quickly and effectively group people together around common interests

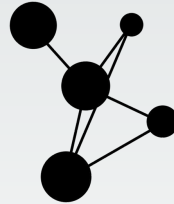


You can group people manually, by collecting information through Google Forms or Typeform, but that would take a lot of time and effort

Business value



The allocation of students to rooms on campus often results in inefficient utilization of room stock



Without us - 3 470 000 ₺*

we cut 1 720 000 ₺

With us - 1 750 000 ₺

* – average cost of accommodating 10,000 freshmen by our estimates



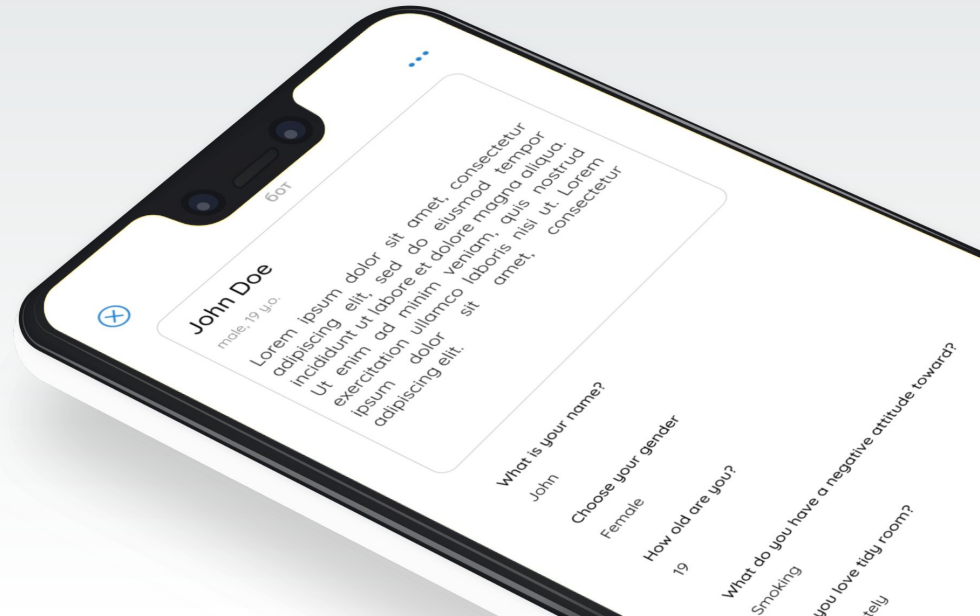
How do we solve this?

0. Questionnaire



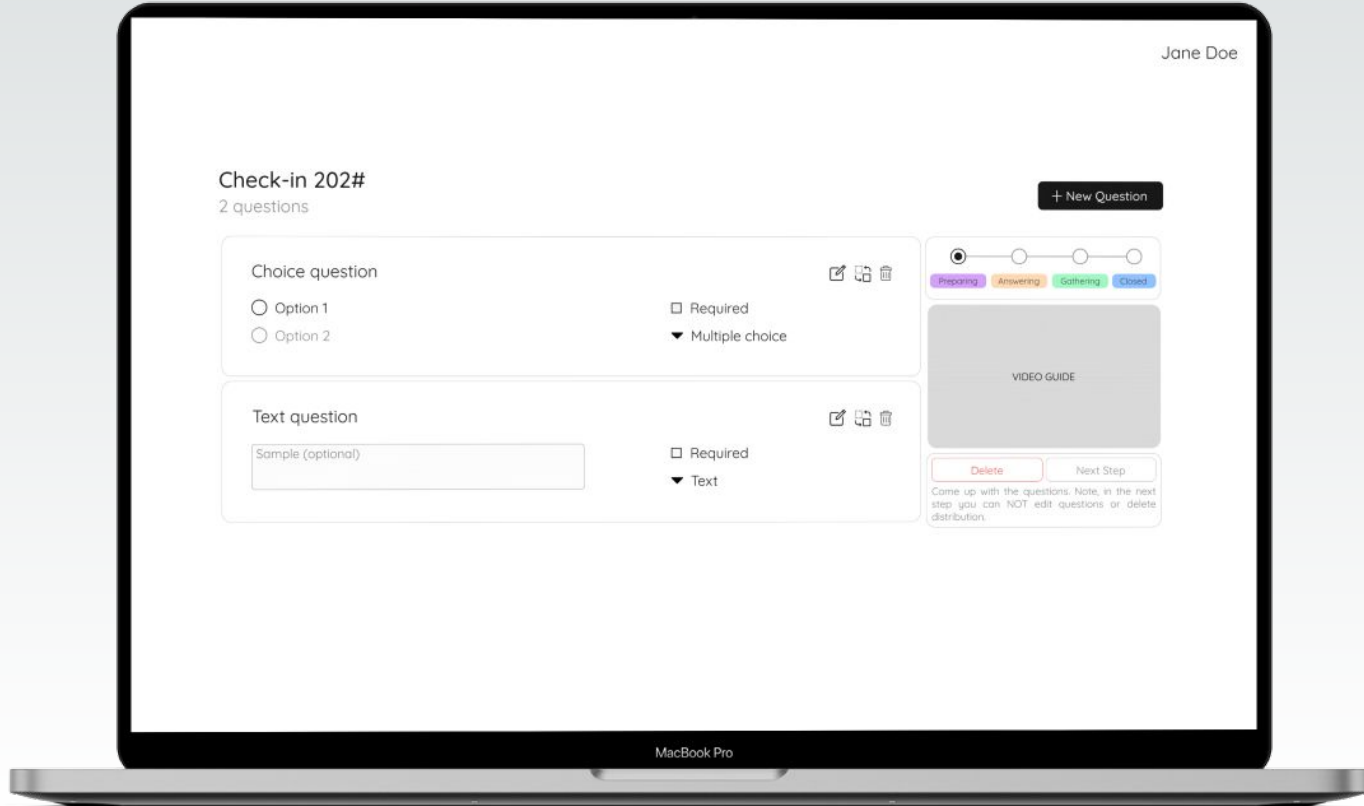
To understand each user's preferences, we ask users to fill a questionnaire about themselves.

- Each organization creates their own questionnaire
- Both multichoice and full-text questions



Questions for all types of events

0. Questionnaire



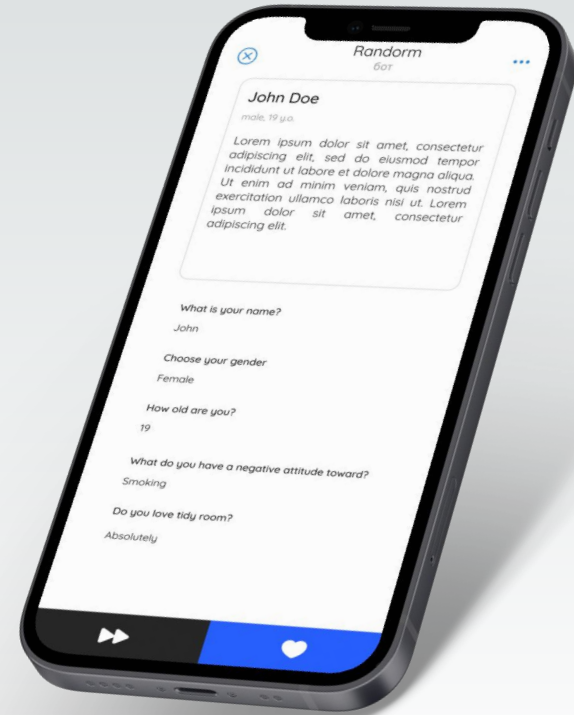
1. Interactive feed



Next phase is the interactive feed, like in dating apps

Like or dislike other profiles, so that our system could learn your preferences

swipe to react

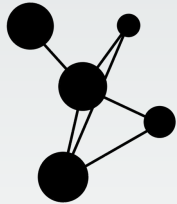


Find your perfect match

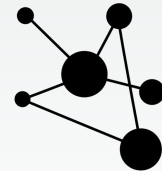
2. Allocation



When all data are collected, our system finds the best combinations of users, with respect to the current room stock. It considers:



- Similarity of questionnaires
- User interactions during the previous phase





Now for the tech stuff

Recommendational system



- FAISS + custom algorithm
- Real-time recommendations
- Accounts both for the questionnaire and user interactions



Fast and flexible hybrid system

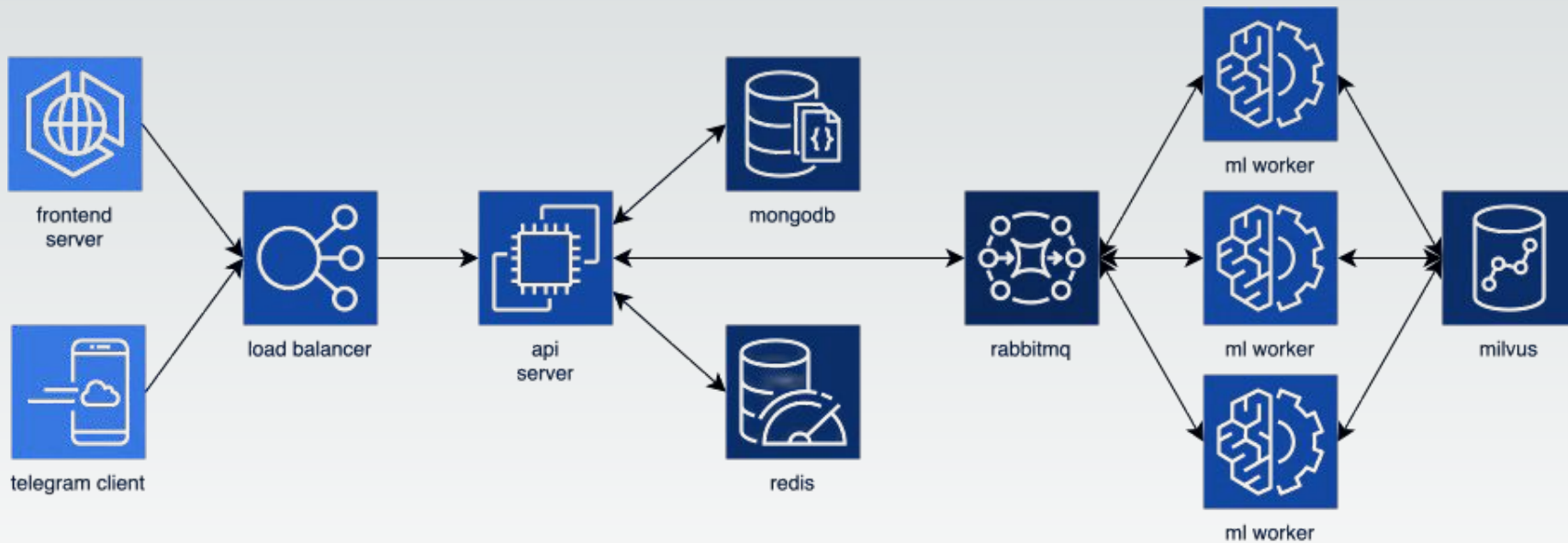
Allocation system



- Initial approximation - algorithm of the Louvain Institute for graph clustering is used. After that we apply the modified simulated annealing algorithm.
- For metric building, three types of metrics are used: a graph-based metric, an ML-inspired metric, and an NLP-based metric for text questions



System architecture



Roadmap



Capstone

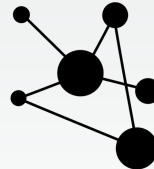
- countless ml-experiments
- new and stable infrastructure*
- reliable recommendation and allocation algorithms

Bootcamp

- collaboration with university administration
- questionnaire launch
- feed start
- participant allocation
- continuous support

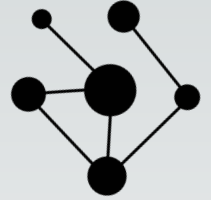
Q4 2024 and beyond

- feedback analysis
- expanding the sales team and increasing the marketing budget
- product release
- scaling to new markets



* – including both ML pipeline and overall backend

We are () random



Web development and
infrastructure team



RnD team,
ML-engineers

We have experience in commercial projects and startups

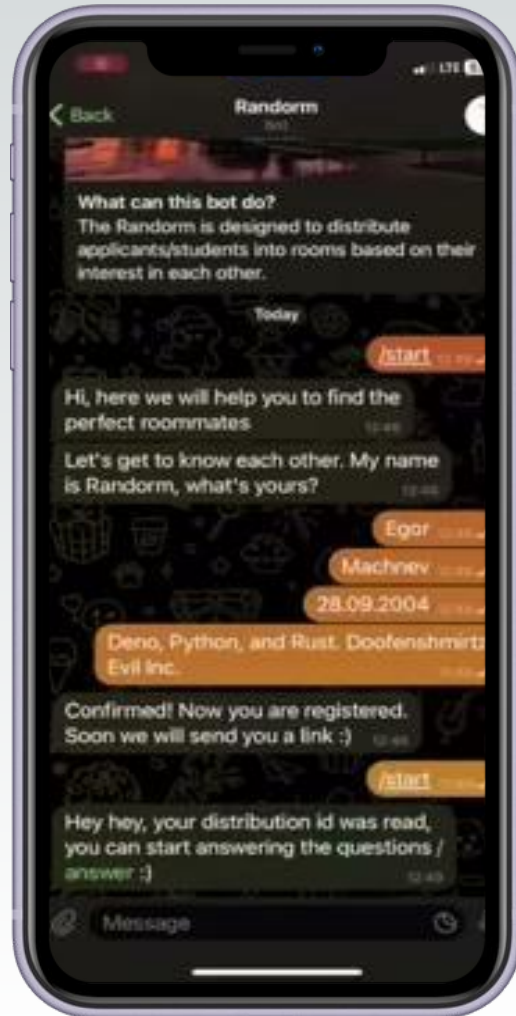
Demo



registration

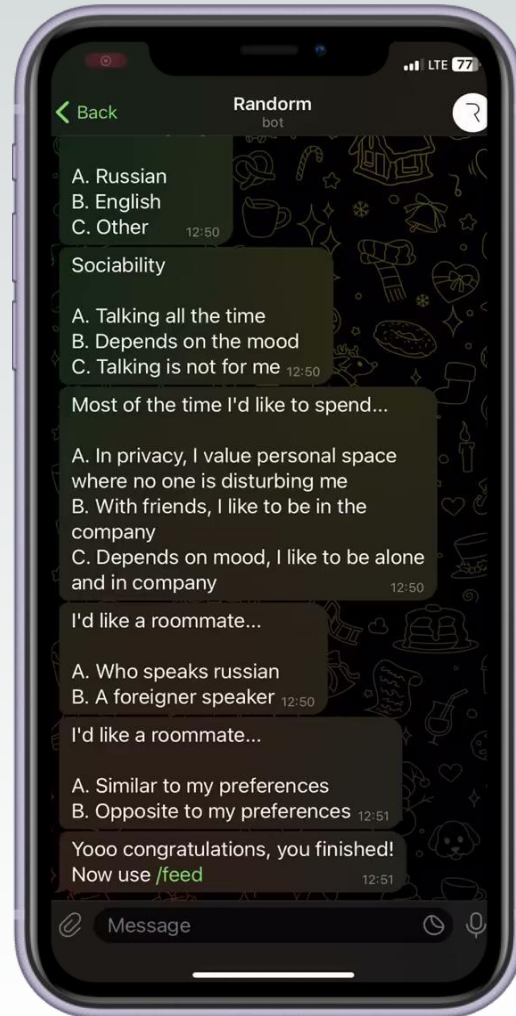


Demo



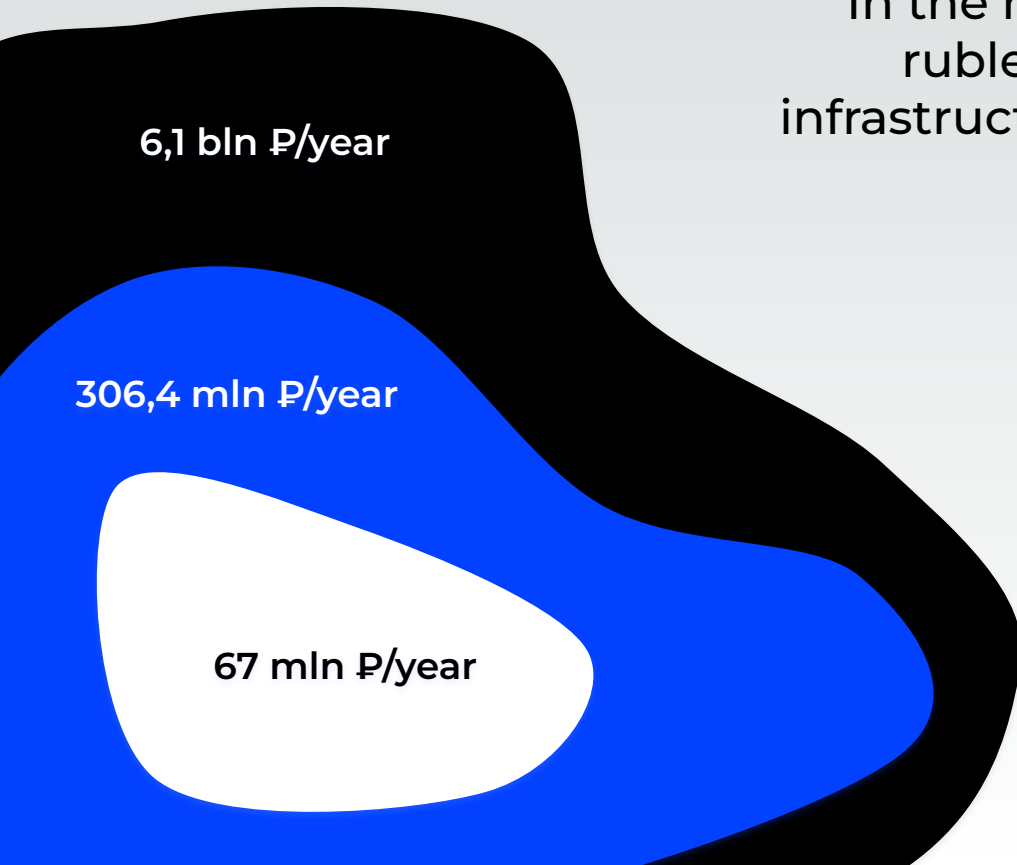
form

Demo



feed

Market



In the next 4 years, more than 36 billion rubles will be invested to develop the infrastructure of educational organizations in Russia

growth 1/5

It is planned to build more than 30 facilities with a total capacity of 150 000