Technology of development of the low-cost indoor-navigation services

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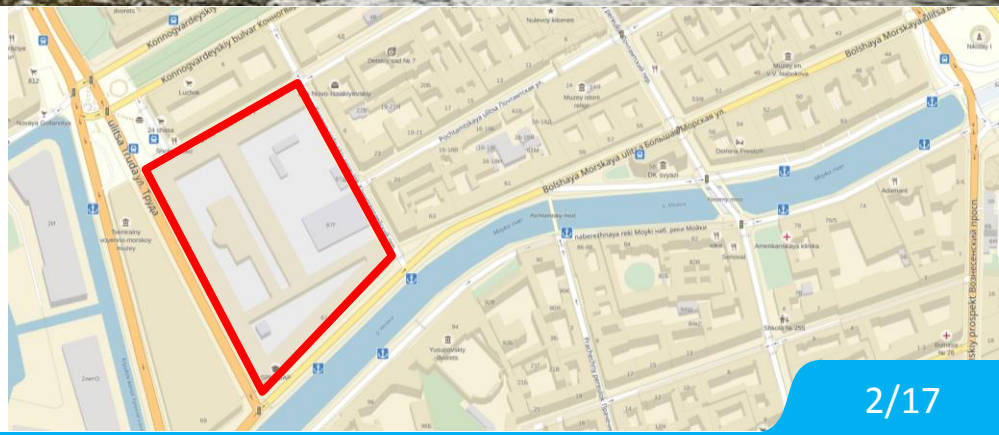
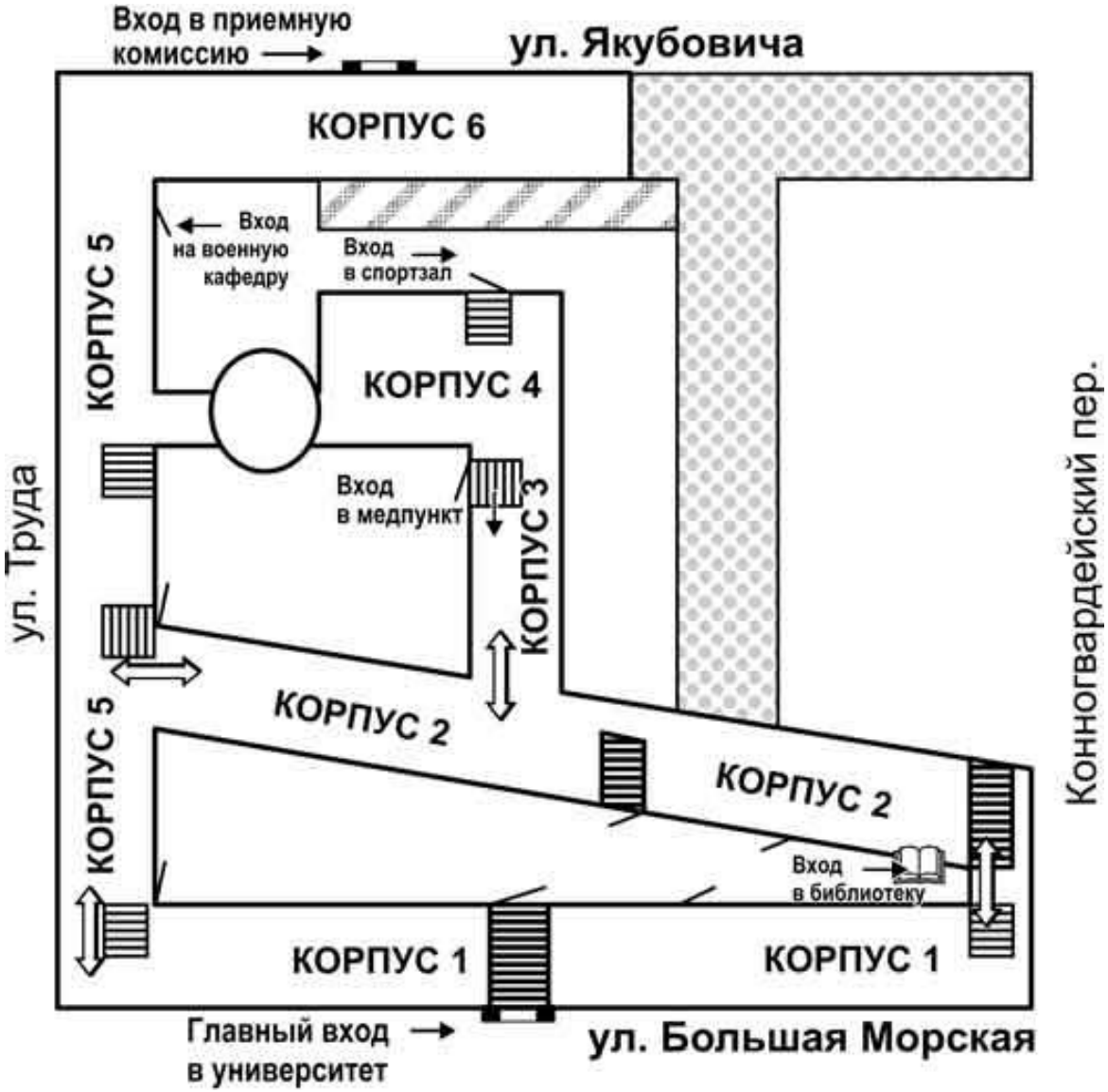
Task

SUAI building

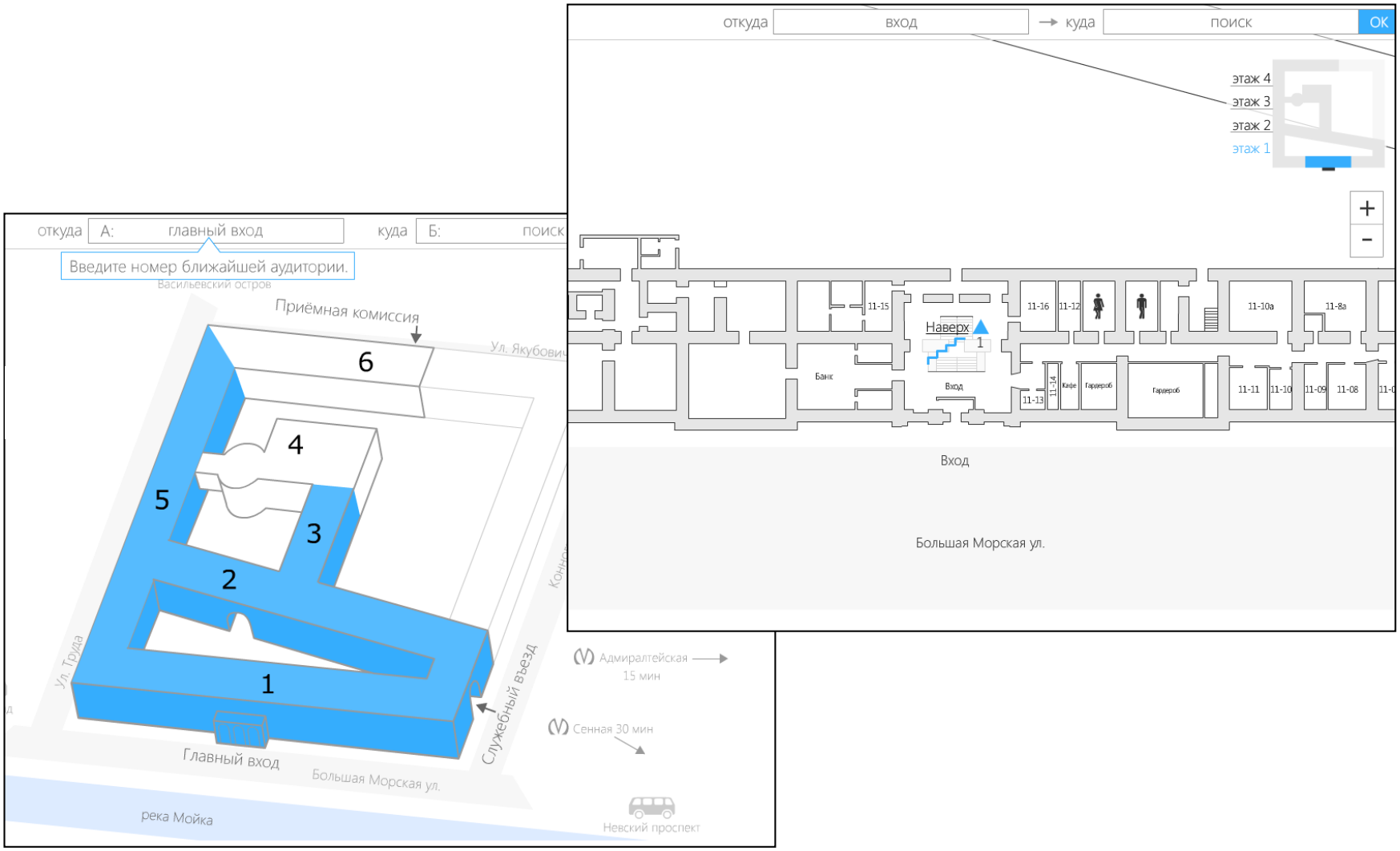
- 4 floors
- more then 500 auditoriums



Task


Вход в приемную комиссию
ул. Якубовича
КОРПУС 6
Вход на военную кафедру
Вход в спортзал
КОРПУС 5
КОРПУС 4
Вход в медпункт
КОРПУС 3
ул. Труда
КОРПУС 5
КОРПУС 2
КОРПУС 2
Конногвардейский пер.
Вход в библиотеку
КОРПУС 1
КОРПУС 1
Главный вход в университет
ул. Большая Морская

First prototype



Technologies for indoor positioning

- Satellite technologies (GPS, GLONASS)
- Inertial navigation systems (INS)
- Wireless LAN
- Short range communication technologies
  - Bluetooth
  - RFID
  - NFC
- QR (Quick Response Codes)

Technologies for indoor positioning

Technology	Required infrastructure	Cost
INS	• Smartphone with various sensors (+-) • Reference map of the place (-) • The compass needs an accurate recalibration (-) • Initial orientation is needed (-) • No floor detection (-)	Nothing Everything is inside smartphone
WLAN	• Smartphone with Wi-Fi support (+) • Wi-Fi infrastructure (+-) • Reference map of the place (-) • Reference map of the Wi-Fi signal (-) • No floor detection (-)	Middle ~20$ per one router
Bluetooth	• Smartphone with Bluetooth beacons support (+-) • Every Beacons has a battery (-) • Floor detection (+)	High ~20$ per one ibeacon
NFC	• Smartphone with NFC reader (-) • Sticker (+-) • No battery (+) • Floor detection (+)	Low ~1.25$ per one sticker
QR	• Smartphone with camera (+) • QR-codes posters (+-) • No battery (+) • Floor detection (+)	Lowest Less than 0.25$ per one sticker

Low-cost positioning

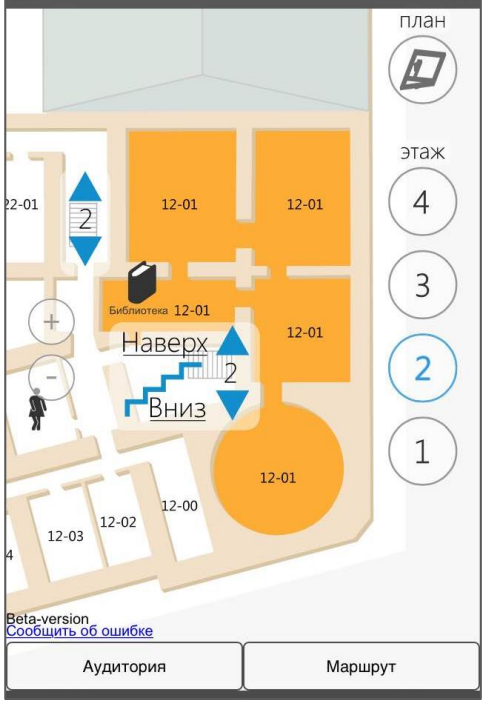
SUAI indoor navigation

You are here

scan or enter «2303» in the box «From»

From: 2303

Scan location



SUAI indoor navigation

Route to 52-33

scan or enter «enter» in the box «From» «5233» in the box «To»

From: enter To: 5233

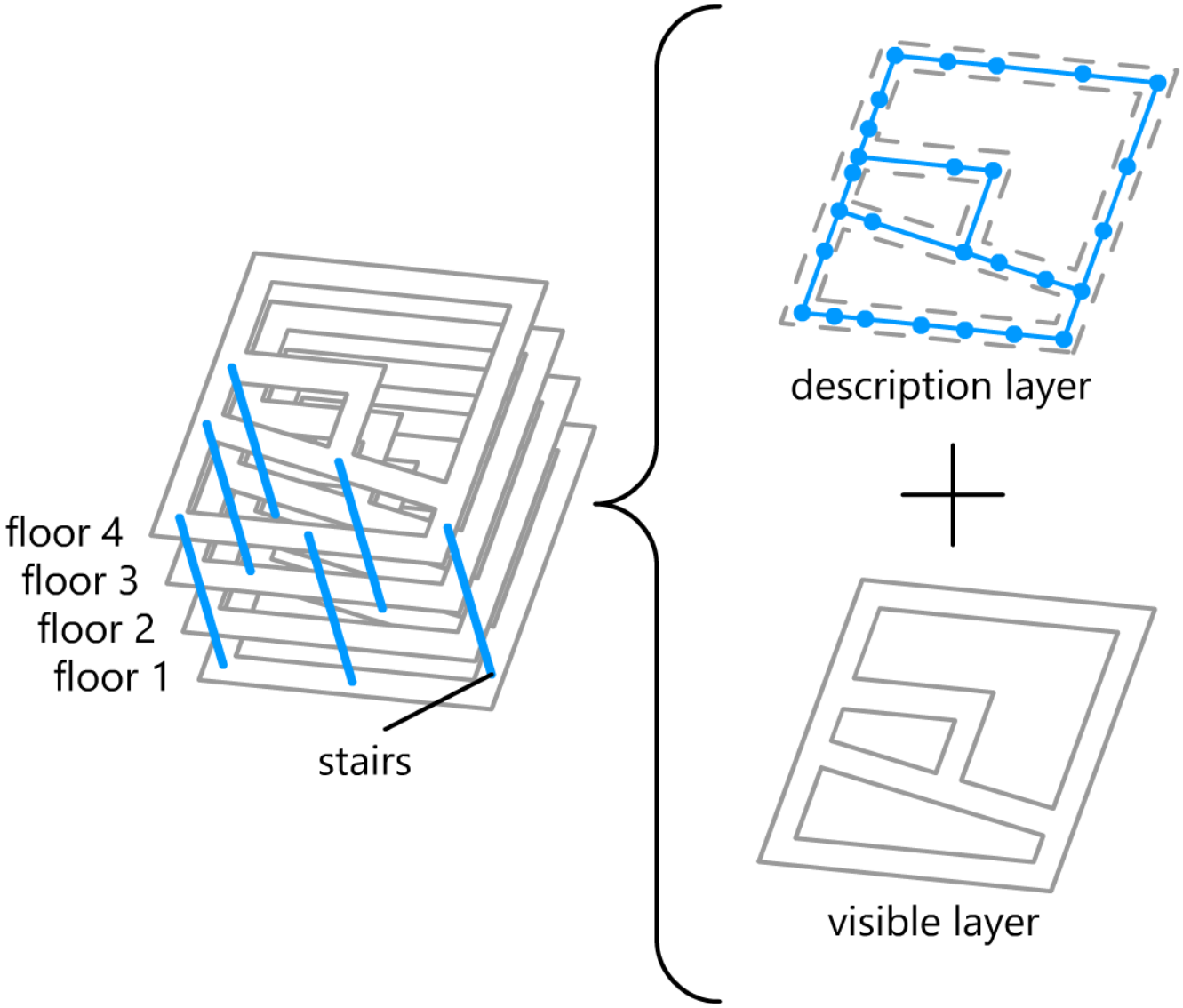
Scan path

SUAI Navigation

Android WinPhone Web version

more info: purecreation.ru/suainav/about.html

Components

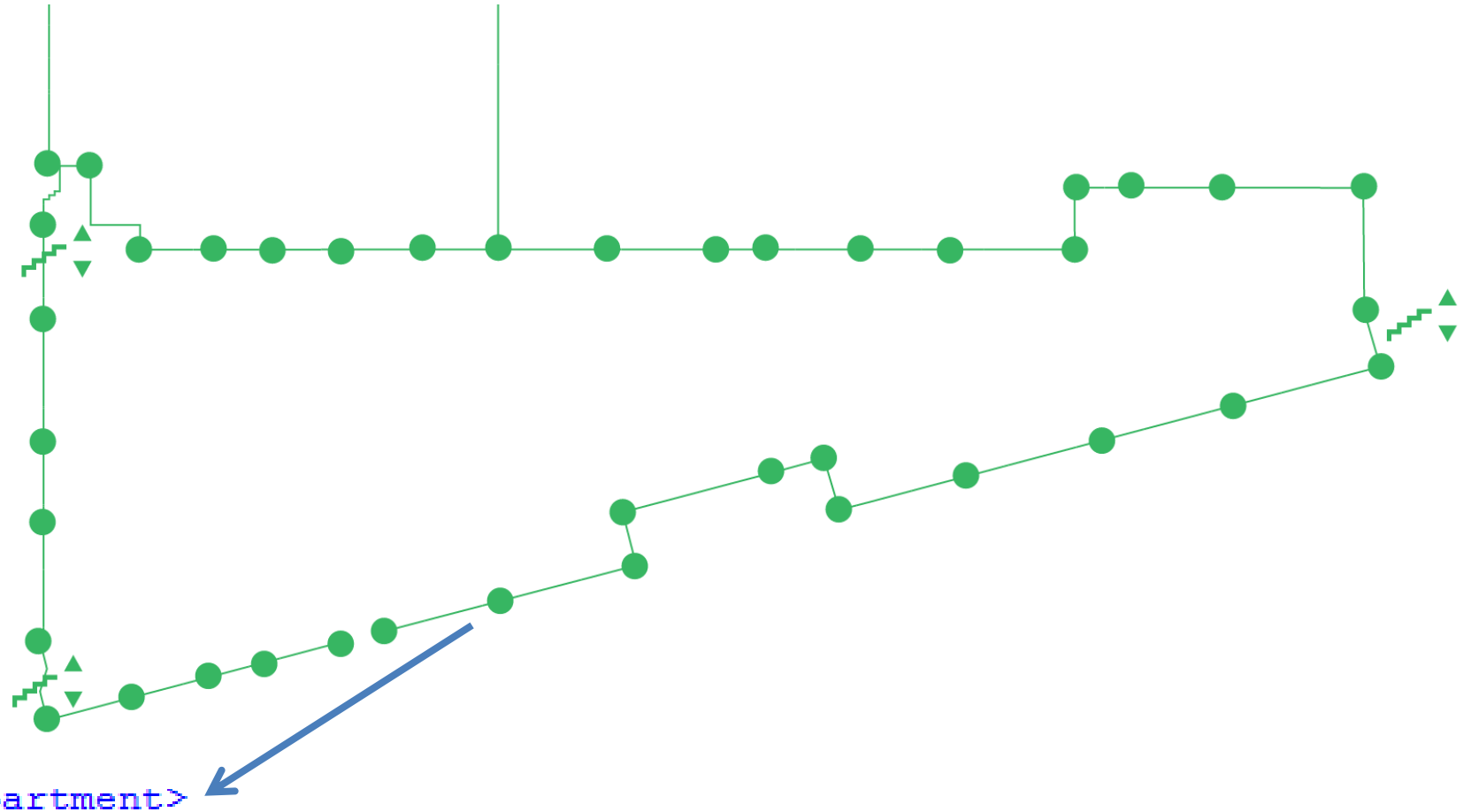


For each floor:

- Graphical representation
- Description

Components. Graphical representation

Components. Description



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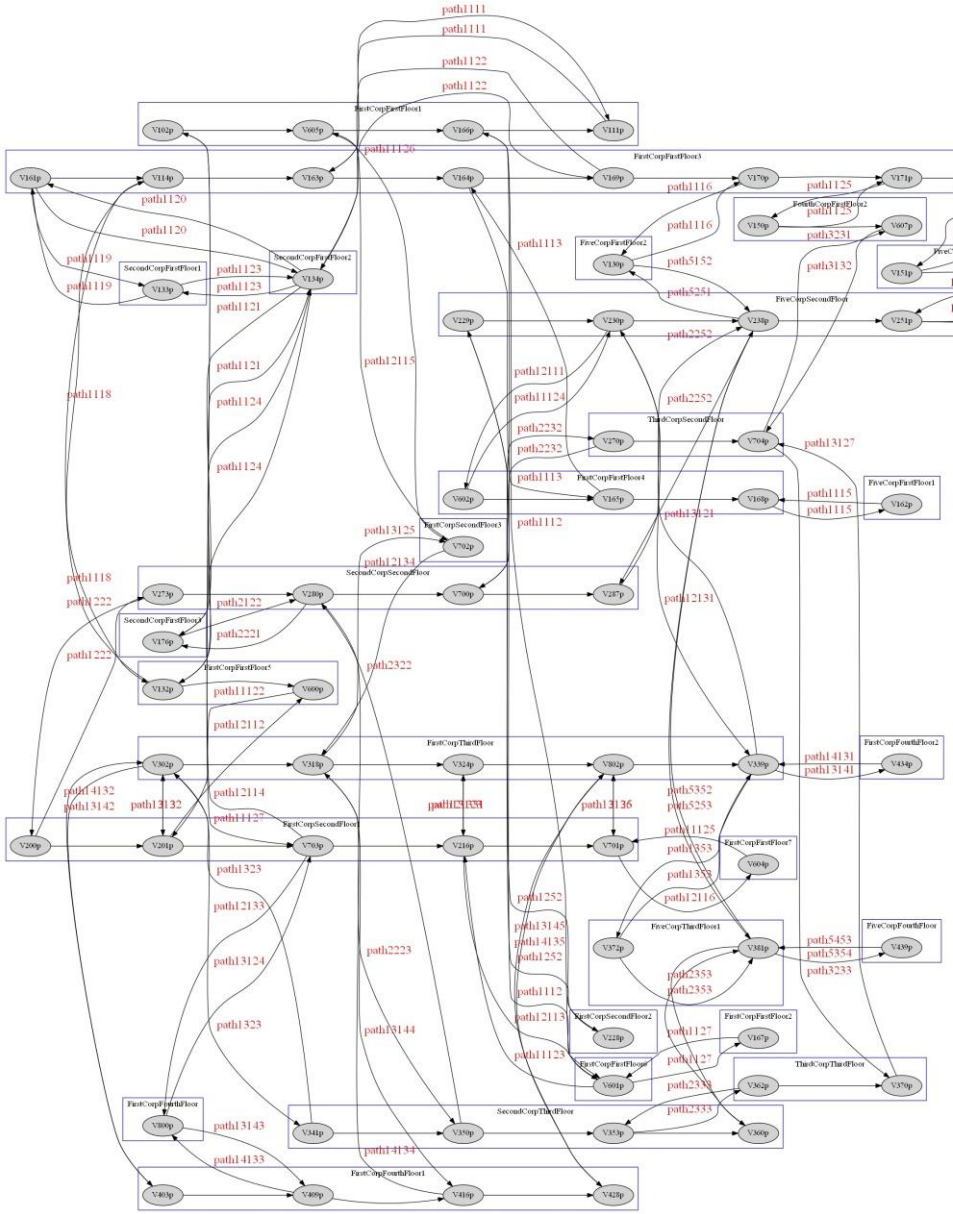
<Department>
    <number >14</number>
    <name>Department of aerospace and computer software systems</name>
    <Auditorium>52-33</Auditorium>
    <Telephone>+7 812 710-62-34</Telephone>
</Department>
```

Components. Routing search algorithm



"scalable" variation of

A* algorithm

(based on Dijkstra's algorithm)

Automated build of indoor services

1

Building description

Graphic

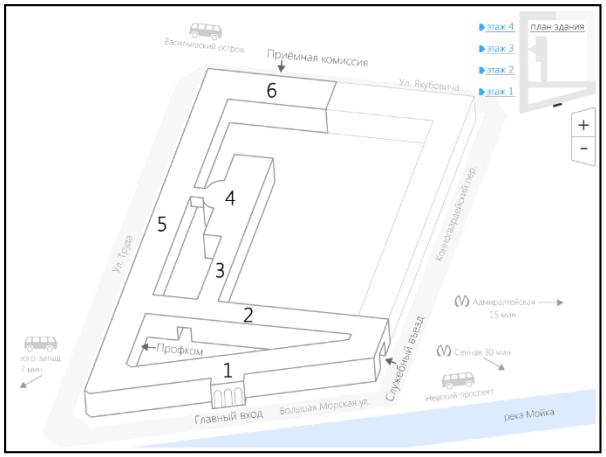
Route algorithm

2

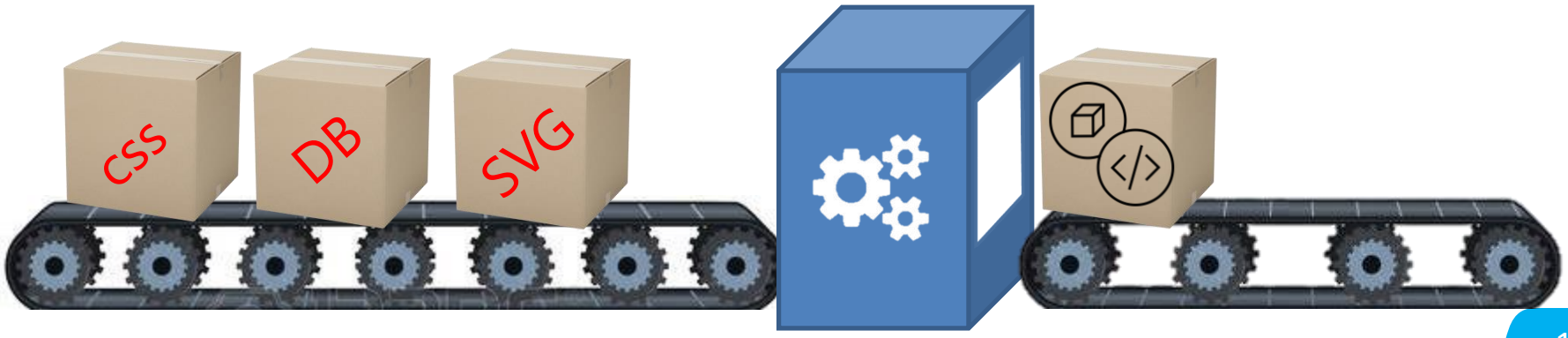
Map Creator

One click!

3



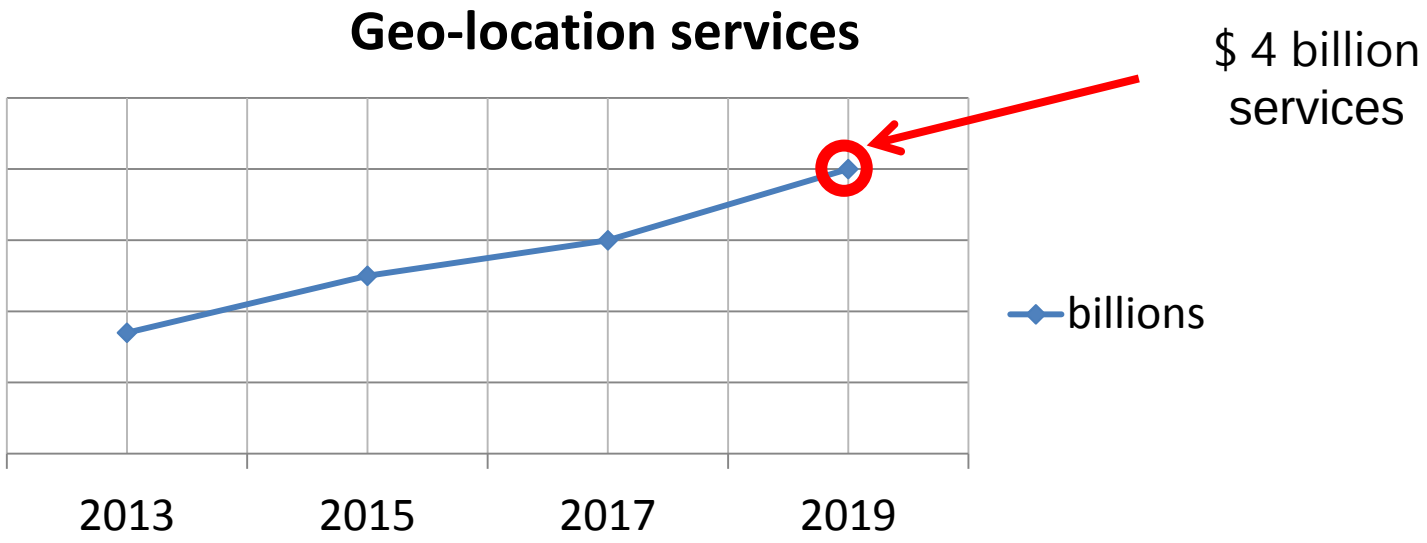
Embeddable web-version



Automated build of indoor services

Perspective

Indoor navigation – popular and promising business directions.



Use case: SUAI Navigation

914 users

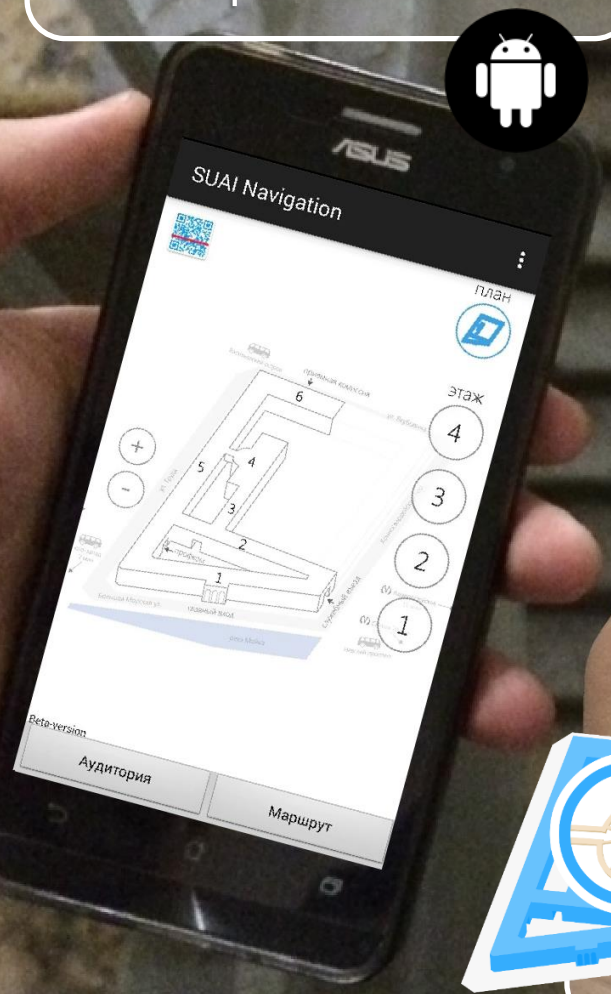
29 September 2015

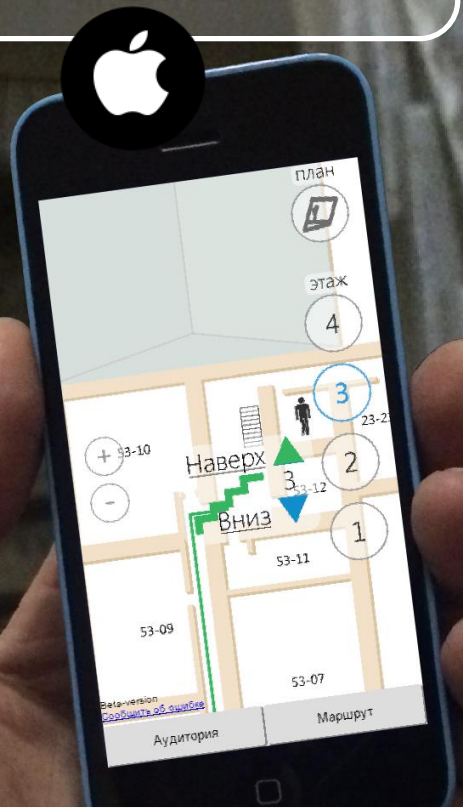
Planning launch

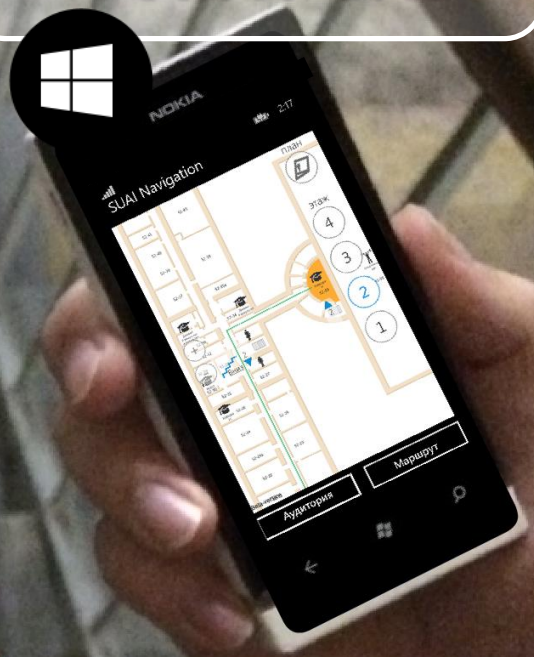
in 2016

73 users

14 October 2015



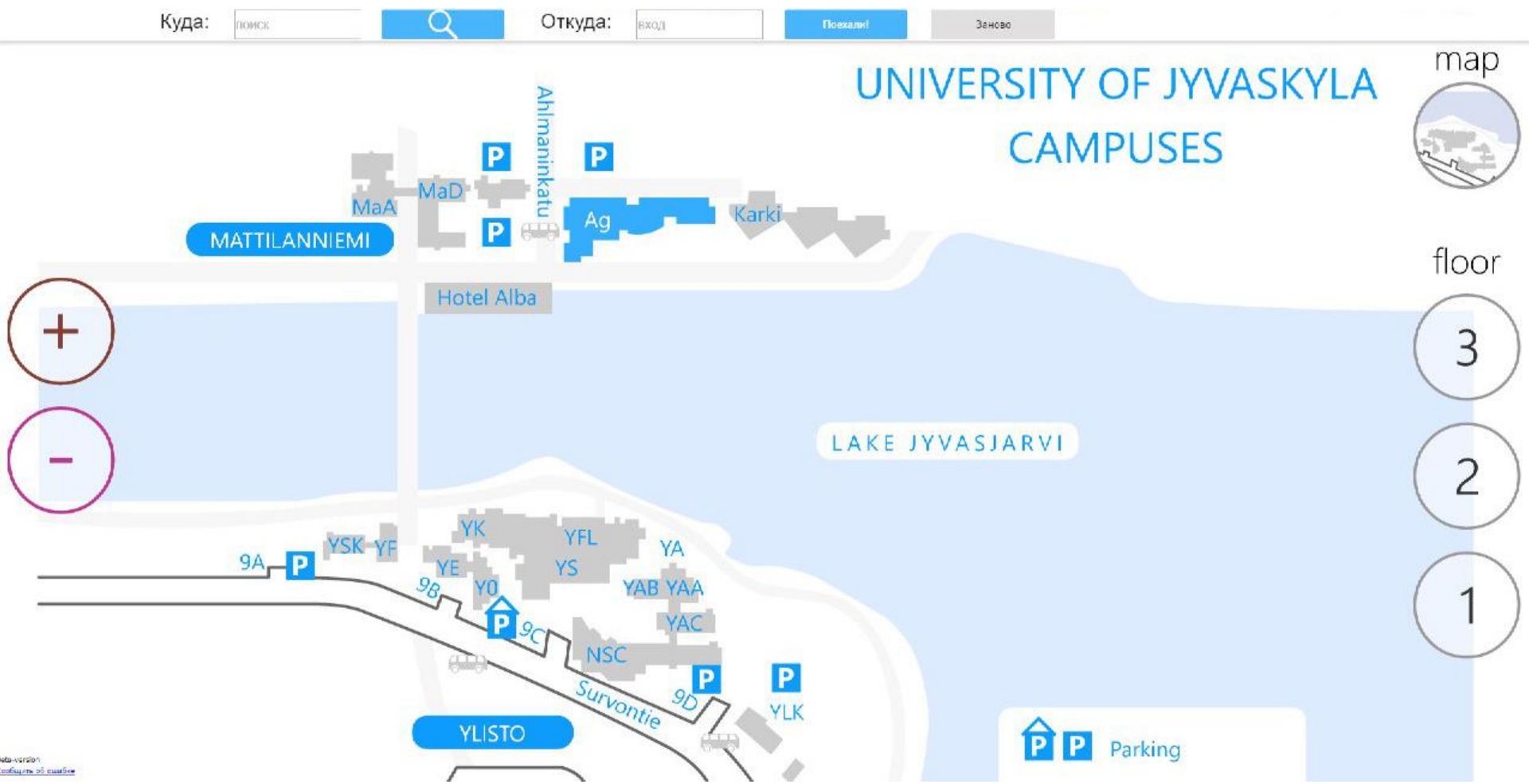




Web-version

In 2014

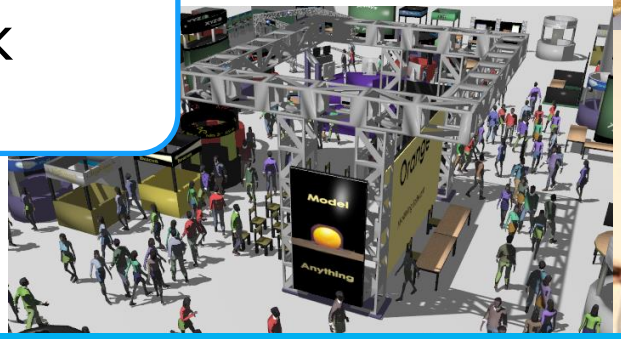
Use case: Jyvaskyla university



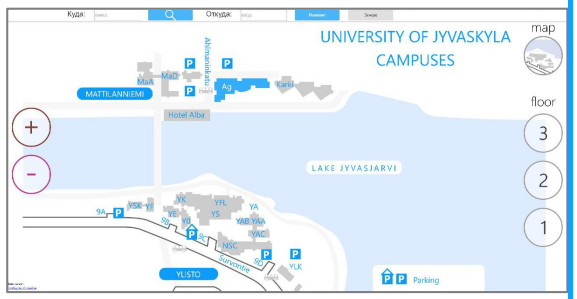
Key notes

- Conferences
- Exhibitions
- Universities
- Shopping malls
- Museums
- Sport events
- …

1 Task

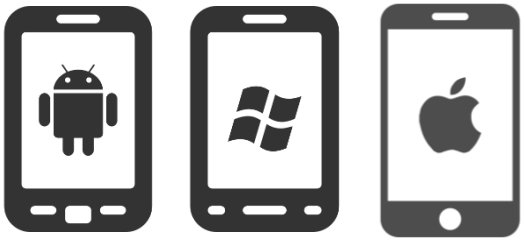


2 Technology



3 Solution

Web version



Web version. Metrics

- Unique visitors:

- Operation systems: