



Skolkovo Foundation technologies for digital transformation of railroads

Mikhail Tykuchinskiy

Head of Industrial Partnership programs, Skolkovo Foundation
Development Director, Energy-efficient technologies cluster



Skolkovo Innovation Centre – the biggest startup incubator in EE



R&D infrastructure

- Offices, labs
- Shared use centers
- Corporate R&D centres

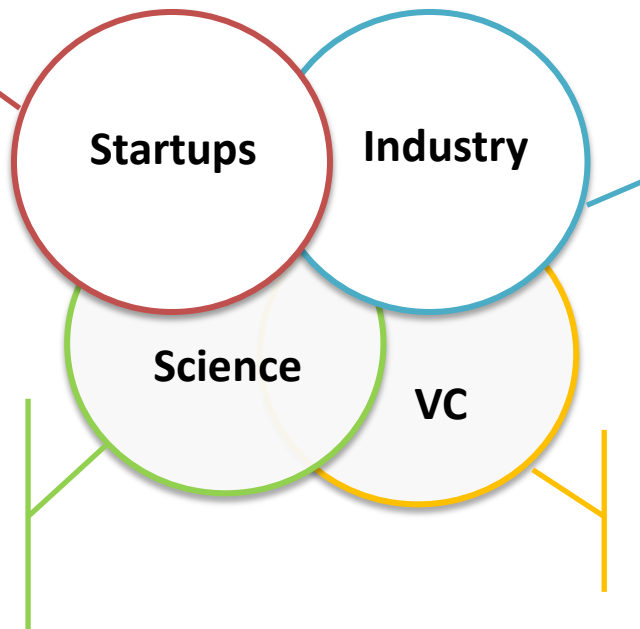
Financial support

- **Non-refundable grants** up to 300 million RUB (~4 mln EUR)
 - **Almost tax-free regime** (available also for corporate R&D centres)
- 10 bln RUR grants (>150 mln EUR) already provided**

Business development

- Mentorship and acceleration
- Venture funds and angels
- Access to markets and promotion

Skolkovo innovation ecosystem



- **1600 Hi-tech startup companies**
- 18 000 jobs
- 10% of all international IP applications from Russia

- **70 Russian and international corporations set up their R&D centers**
- 5500 employees by 2019
- **400 industrial companies connected to Skolkovo ecosystem**

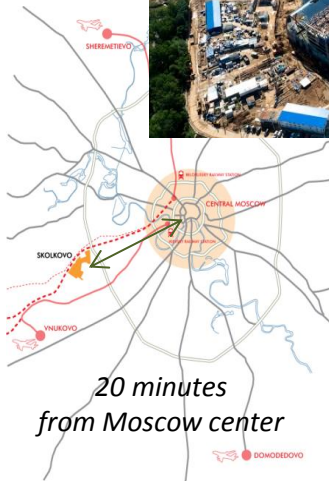


- **450 PhD and MSc now**
- 1200 – by 2020
- **10 centers of science, and education and innovation**
- 15 by 2020

- **46 accredited funds**
- **~USD500M** soft commitments
- >200 Business angels
- >200 Mentors

Skolkovo Innovation Centre

- 30 000 people
- 450 ha of land
- 2,5 mln sq m²
- completion by 2020



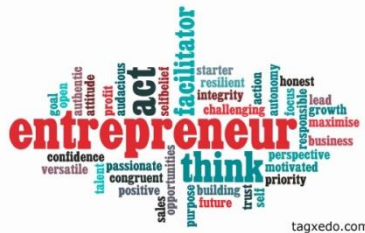
Key elements for innovations growth are available at Skolkovo



INNOVATION FROM CROSS INDUSTRIALISM

Cross industrialism and cross functionality are two big innovation drivers

5 technology-focused clusters at Skolkovo, uniting all types of technologies and connected to all major industries



ENTREPRENEURIAL SPIRIT

Hunger for the new is the core driver of transformation and entrepreneurship

Corporations and start-ups work together – start-ups are profiting from infrastructure and the network, while corporates adopt entrepreneurial spirit and thought patterns



STRATEGIC EXPERTISE

Unbiased expertise is vital for selection of the best technologies and building trust with corporates

More than 700 high-class experts from all over the world evaluate thousands of projects at Skolkovo in order to select the best

Startups are the major driver for disruptive changes of the whole industries

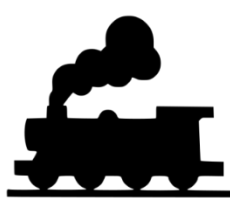
The Travel Tech Market Map



**Increase efficiency,
create new
services &
business models**

What makes the transformation digital?

500 startups in the IT cluster only cover all major technologies, which are the basis for digitalization of the industry



- **Connectivity**
- **IoT – Industrial Internet of Things**
- **Big data storage and management**
- **Analytics based on big data**
- **Cyber security**
- **Man-Machine interaction**
- **AR/VR – Augmented and virtual reality**
- **Artificial Intelligence**
- **Automation**



For locomotives and infrastructure

- **New opportunities for optimization and management efficiency due:**
- **Connected physical and virtual objects**
- **Increased speed of data processing and storage reliability**

For passengers

- **Personified approach**
- **Reliable and secure communication**
- **Better value proposition**

Winnum – Internet of Things platform



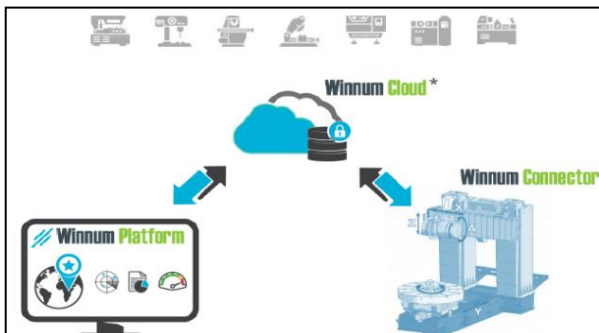
Fast and easy platform for IoT

Winnum Platform – the full range of instruments for remote monitoring, diagnostics and managing connections, including development of specialised applications for remote work with any type of devices, sensors, etc.

The next generation of SCADA systems and their application for IoT. Reduces the time, costs and risks associated with the creation of innovative applications of industrial concept of IoT.

Winnum Platform:

- Automated monitoring, diagnostics and control of industrial equipment
- Monitoring measuring and control operations and tests
- Compatible with all major LDAP-servers, including Microsoft Active Directory, for user authentication in accordance with corporate policies and standards
- Data encryption based on keys and security labels
- Supports all major databases, including database open source – PostgreSQL and also Oracle Database, Microsoft SQL Server
- Alert users via SMS and email
- No need to purchase third-party paid software
- Cross-platform, Windows and Linux support
- Own object data model
- 100% developed in Russia

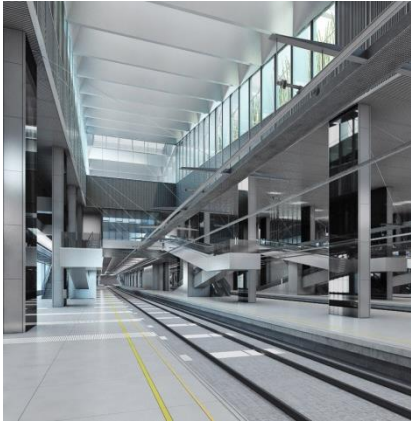




VIZERRA –3D visualization for planning



Example of use:
Transport hub at Sagrera,
Barcelona (Spain)



Vizerra is a software platform for creating 3D models with integrated content

Visualization platform allows to save the cost of designing major construction projects, reduce the number of design errors and model cost options

The budget for construction of a hub Sagrera in Barcelona was 650 million euros, Vizerra helped to save 65 million euros by optimizing the project. Total cost of implementation was 1 million euros.

Task - Reconstruction of the district La Sagrera in Barcelona, and the construction of the eponymous transport hub - one of the most ambitious construction projects in southern Europe - hundreds of specialists, public hearings and approval of the Government and the search for investors.

Implementation - Vizerra created an interactive 3D-model of the future transport hub La Sagrera that became a single point of decision-making. The model was used as a universal tool for collaboration of architects, urban planners and municipal authorities of Barcelona.

Result - 10% of the project budget savings, 15% changed in the project, investment obtained in 2 times ahead of schedule, the government and city residents supported the project.

RAIDIX – Data storage optimisation

RAIDIX software converts standard server equipment to professional high performance storage systems



RAIDIX HPC

- High-performance software storage system with block and file access
- Supports any storage hardware - flexible solution that can be easily integrated into existing infrastructure and adapted to a specific task
- Optimized for resource-intensive applications, ensures continuity of support for computing processes, the highest level of availability and data integrity
- The storage module, built on x64_x86 standard server hardware, can contain up to 128 titles in high-density housing
- Guaranteed storage performance is 35-40 Gb/s for a 42U system

RAID levels
0,5,6,7,3,10,N+M

Active-Active
mode
for SAN

Fast data
reconstruction

SSD cache

Manage multiple
systems

Correction of
hidden errors

QoSmic - priority
application
performance

Guaranteed
performance

Global partnership with
Panasonic



VisionLabs – Face Recognition

Better than Google face recognition, 75vs73% efficiency



>30 deployments at large enterprise customers (Russia, Kazakhstan, Vietnam), 133 thousands of users every month interlocutors

- VisionLabs technology is officially included in TOP-3 best commercial face recognition systems according to the results of independent tests
- The best in the world for the quality of face recognition
- Up to 200 times faster than any competitor
- High-quality recognition in real-time
- Successful performance when process millions of photos and videos
- Industrial integration with the best BI systems

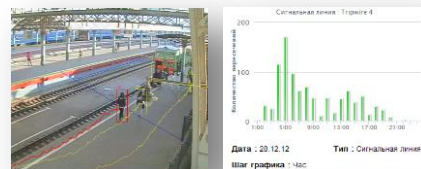
Examples

- **Equifax**, one of the world's largest credit bureau, licenses VisionLabs facial recognition technology for fraud detection at the stage of processing credit applications using biometrics
- **>500 million EUR** prevented losses over the last 12 months

Automatic railway carriage ID recognition



Passenger traffic analysis



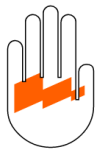
Wallarm – web applications security

Lowest false positive rate in the world, 0-1%



Permanent security for web-based applications

audit of large and huge web applications –Online-banking, e-commerce, social networks, official websites, all kinds of web infrastructure



Minimal False Positives

Wallarm continuously updates blocking rules for your application, thus minimizing false-positives and insuring your application is protected by ever-evolving security rules



Machine-learning Based Attack Detection

Wallarm profiles application structure and user behavior, then uses algorithms to identify anomalies and detect sophisticated attacks



Unique Attacks Analysis

An attack isn't dangerous unless it targets an application flaw. The Wallarm built-in vulnerability scanner analyzes each attack relative to your application



Enterprise-Grade Web Application Firewall

Instant protection against SQL injection, cross-site scripting, illegal resource access, remote file inclusion and other OWASP Top-10 threats

BOT-TREK – Big data analytics for security

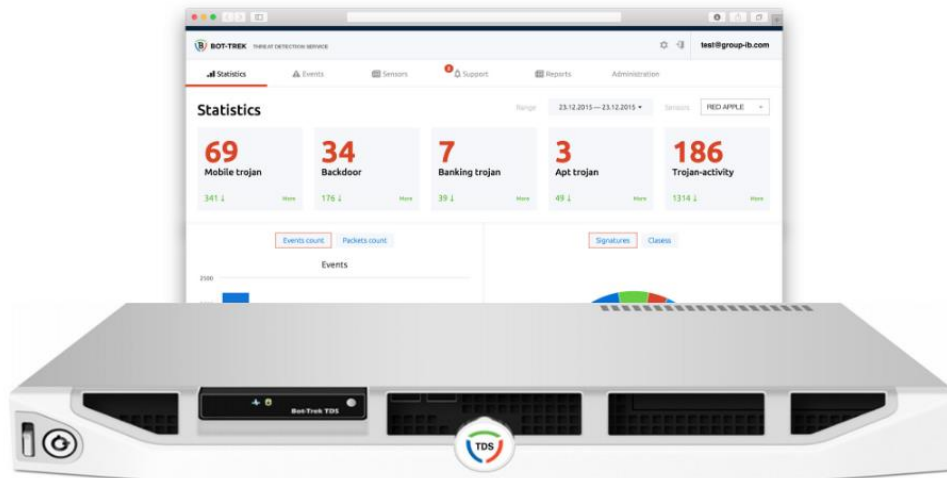
One of the highest rate of identification of unknown threats in industry



BOT-TREK

Group-IB is one of the global leaders in preventing and investigating high-tech crimes and online fraud

Real-time botnet and cyber intelligence service that provides a direct access to compromised data and helps to prevent fraud. Detects fraud preparation and execution without installing any software on client devices



Clients



Immediate notifications on all relevant malware families



Identification of infected devices in your company's wireless networks



24/7 support via a convenient ticket system



Manual log analysis and allocation of critical incidents by Group-IB experts



Daily and automatically updated filter rules and signatures



User-friendly web interface and detailed reports on detected threat

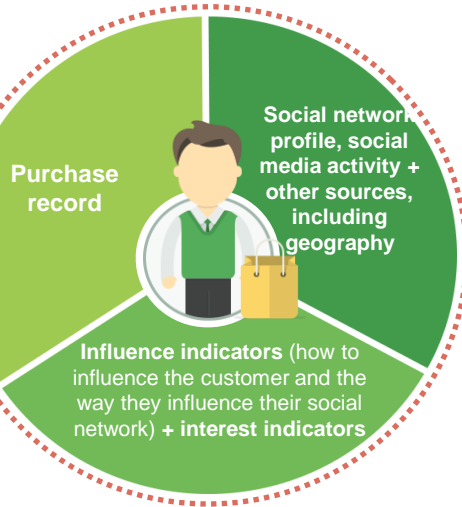
Flocktory – loyalty management

The best marketing SaaS platform based on Big Data analysis of customer behavior



Flocktory — B2B SaaS marketing platform based on big data analysis of customer behavior

Enables new customers attraction, increases conversion, manages loyalty and works with other values at any stage of a purchase funnel via customized shopping background and Big Data processing



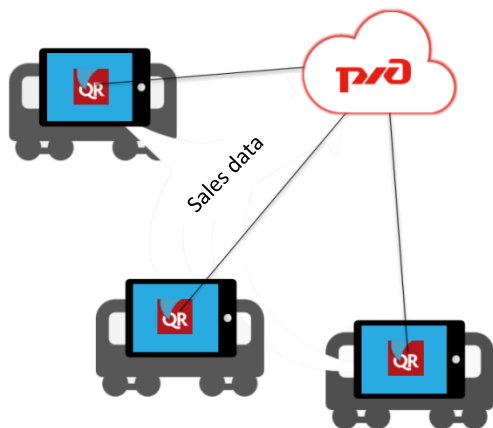
- Sales growth
- Increase of customer lifetime value
- Cutting marketing costs on customer acquisition
- Raising brand awareness
- Identifying relevant influencers and brand advocates



Quick Resto – passenger service system



Unique passenger service system –
makes feeding in trains easy!



Minimal cost of integration
and support



Tablet based
mobile terminal



Ease of use



Easy install and
configure



No local server



- Customizable menu and range of products, price lists, routings, warehouse account
- Synchronizing with the back office at the stops or on arrival at the destination if no Internet on the way
- Mobile terminals based on tablet computers running all day
- Centralized management of an unlimited number of terminals
- Supports fiscal printers and other peripheral equipment
- Flexible loyalty program for regular passengers

All Skolkovo clusters can contribute to digital transformation



Vist Minig Technology



Unmanned dumper and automated open-pit mine



Aquamarine



LIDAR based detection of oil slicks on the water surface



Microtest



Blood vessels non-invasive diagnostics based on skin measurements



Strij Telematics



Energy efficient wireless telematics (M2M) based on LPWAN



Axell



Telemetry system for on-line monitoring the drilling process

>1600 startups in Skolkovo
and getting more and more

COME AND TAKE ONE!

Skolkovo Foundation

Mikhail Tykuchinskiy

mtykuchinskiy@sk.ru

+7 910 434 1930

