MANUFUTURE 2017

TALLINN UNIVERSITY OF TECHNOLOGY

Exploring University-Business Partnerships and Identifying the Best Fit to Maximise Research Impact

Renno Veinthal

Vice-Rector for Research

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National RDI strategy 2014-2020 „Knowledge-based Estonia“

PRIORITIES

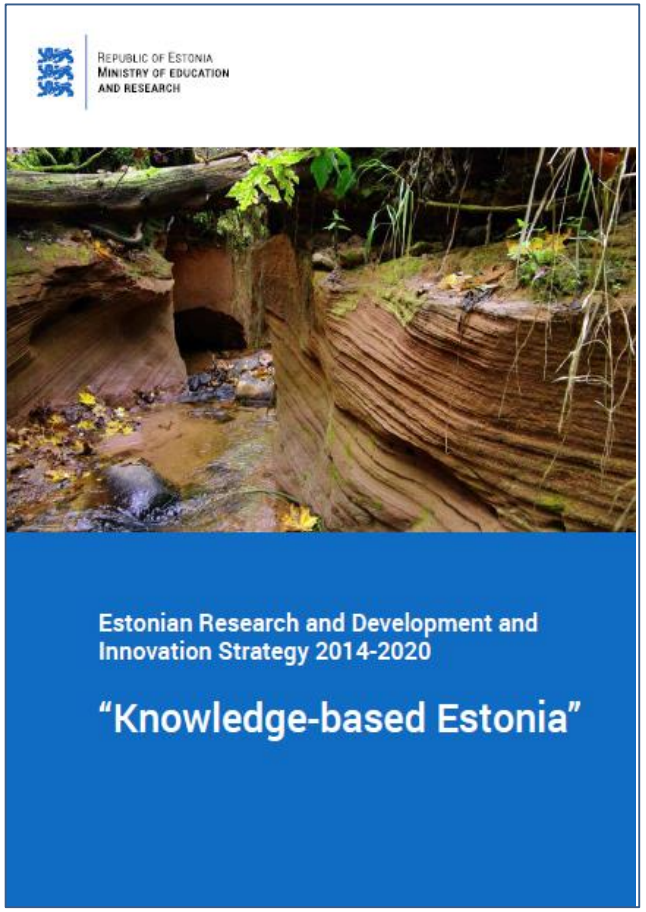
1. Excellence and diversity
2. Increasing socio-economic impact of R&D
3. Changing the economic structure through **Smart Specialisation**
4. International cooperation

Smart Specialisation areas:

ICT
- *horizontally through other sectors*

Healthcare
- *Biotechnology*
- *E-health*

Resource valorisation
- *Chemical industry (shale oil)*
- *Innovative construction (wood)*
- *Functional food*
- *Innovative materials*



TTÜ in numbers

- Appr. 12 000 students (25% of all students in Estonia study at TTÜ)
- 4 faculties (2017)
- 2015/2016 - 1/3 study programmes in English
- ~2000 graduates each year, 2000 employees
- TTÜ is the most preferred university - 72% of high school graduates in Estonia prefer TTÜ for continuing their studies
- 1900 international students from 99 countries (incl. degree and exchange students) 40% of all international students in Estonia
- Over 500 partner universities
- 4 university-business agreements per week
- 6.2% of university's revenue comes from cooperation with companies

TTÜ Innovation and Business Centre Mektory

- Over 200,000 visitors from near 160 countries
- 110 companies, 8 embassies, 50 projects

TUT Innovation and Business Centre

MEKTORY

MODERN ESTONIAN KNOWLEDGE TRANSFER ORGANIZATION FOR YOU

The aims of TTÜ Mektory

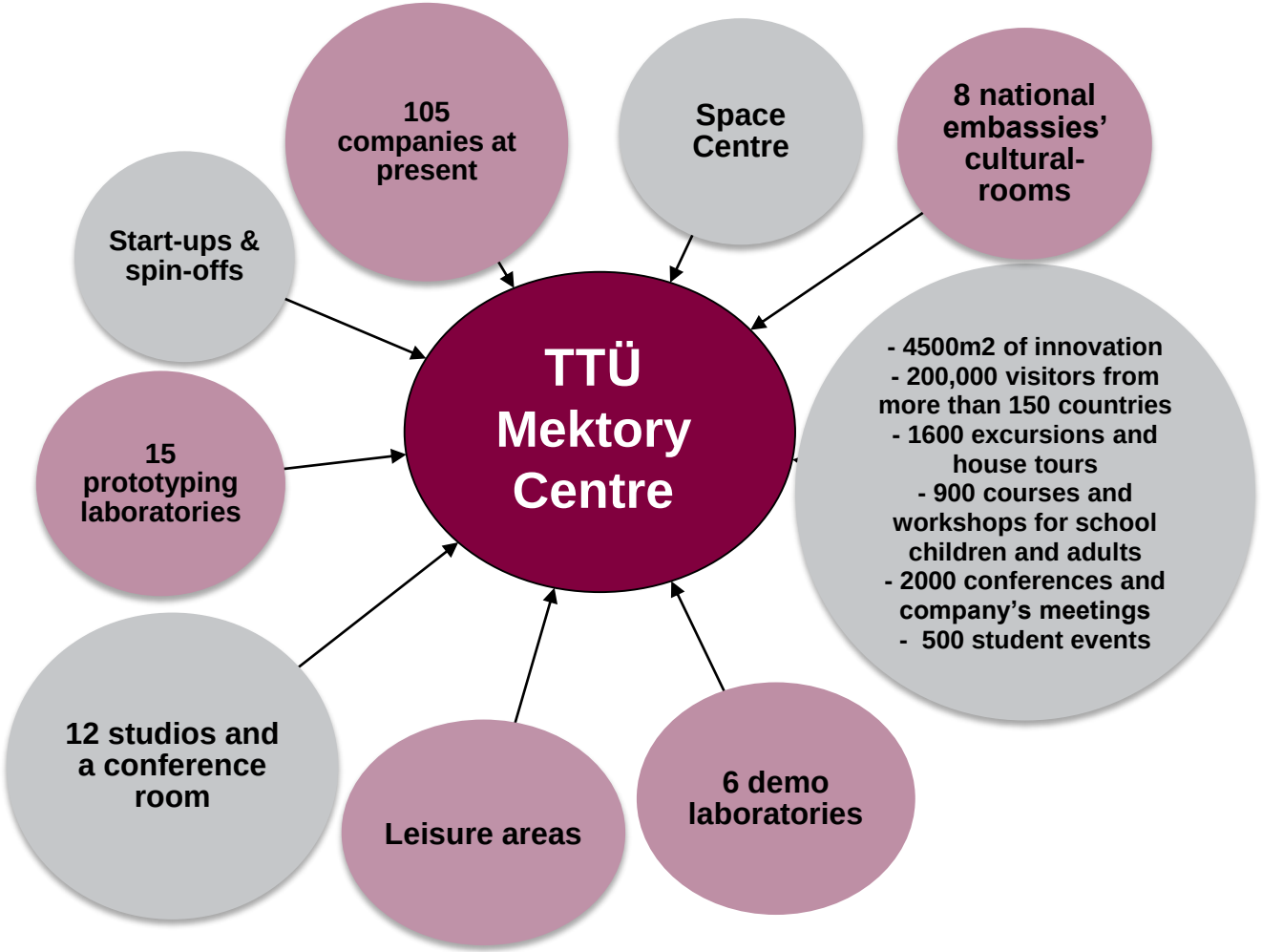
- To bring together scientists, students and entrepreneurs, to solve practical product development problems and generate new intelligent ideas *(technology transfer)*
- To maximize theoretical studies at the university through practice, to prepare better-trained engineers with experience in cooperating with companies *(labs, practical side of the studies)*
- To encourage students *start-up companies* to move forward
- To address upcoming generations and show that engineering is exciting, feasible and down to earth *(School of Technology)*
- To guarantee success in internationalization by bringing together different cultures, working habits, ideas and interesting solutions

Mektory –a way of thinking!

TTÜ Innovation and Business Centre Mektory

Modern **E**stonian **K**nowledge **T**ransfer **O**rganisation fo**R** **Y**ou

International innovative ecosystem, where businesses, students, professors, schoolchildren and investors from all over the world meet to generate new ideas and innovation together as one team.



Studios and labs in TTÜ Mektory

Studios and demo centres

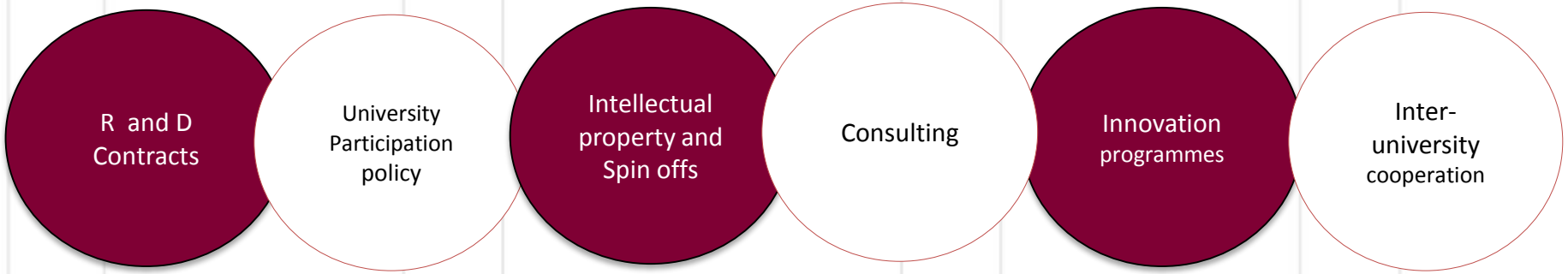
- Samsung Digital Academy
- Ericsson Connectivity Room
- Ventilation lab „Club Fresh Air“
- Logistics lab
- Business models
- Glass Studio
- Energy Studio

Prototyping and testing labs

- Wood lab, metal lab
- Welding lab, paint lab
- Automaticum, elecronics lab
- Mechatronics lab, Cool Tool studio
- 3D Printing Innovation Lab
- Telia Testlab
- LEGO lab „Playful learning“
- Smart Lab
- Virtual reality lab „Re:Creation“
- eHealth lab, eRiik
- Space Centre
- Heating lab „Utilitas“

Innovation and Business Centre Mektory's services

- Technology transfer



- Mektory building as a networking venue
- Popularizing engineering among youth
- Start-up ecosystem (programmes)
- EducationUSA Advising Centre

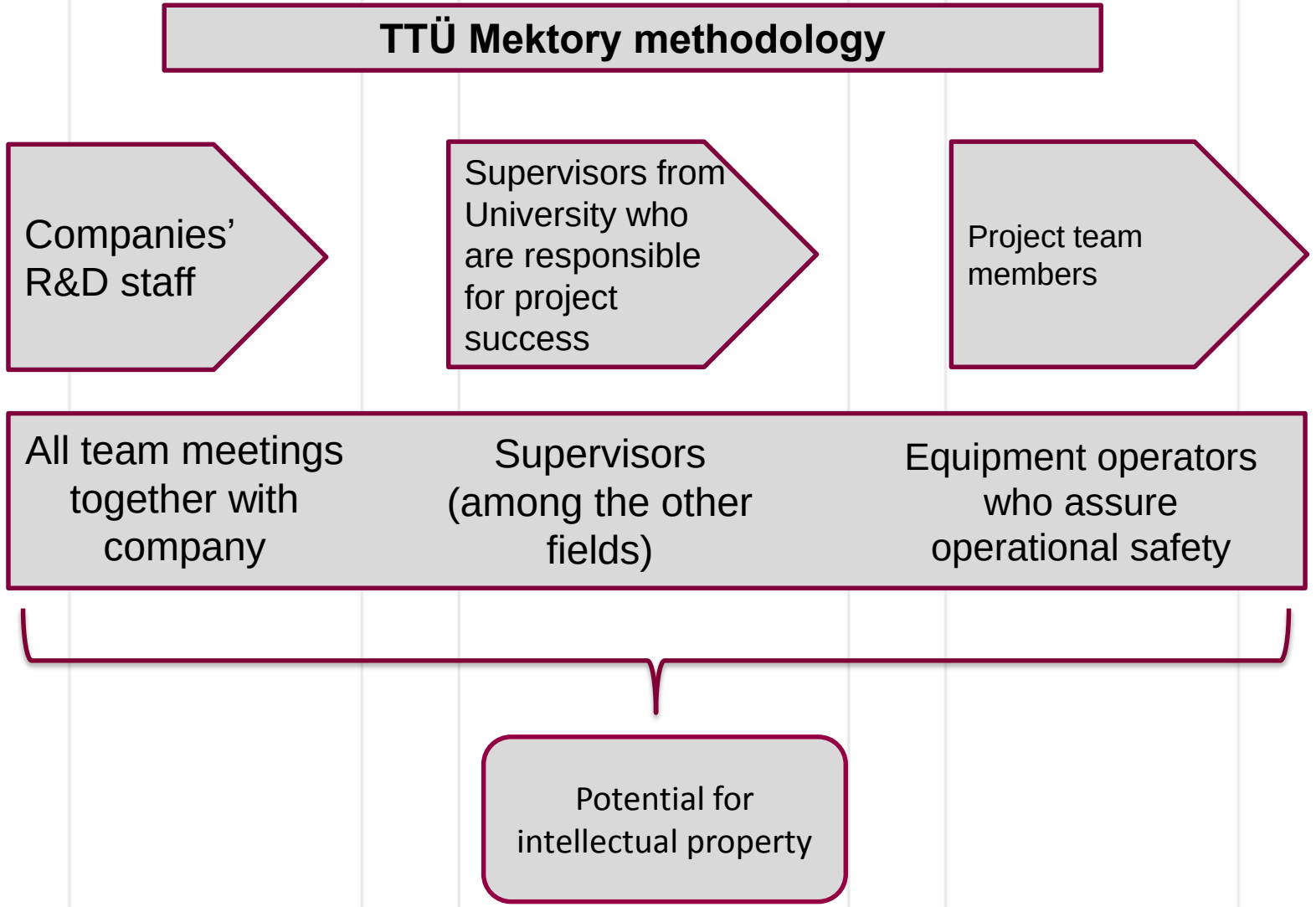
Technology Transfer

Technology transfer is responsible for long term partnership between the university and companies

- **R&D:** Projects, lab services, consultations, surveys, analyses, long and short-term contracts;
- **Project Management:** Preparation of project applications, consultation, administration;
- **Spin offs and start-ups:** Support in creating a spin off/start-up
- **Consulting:** expert advises, programme development, content marketing, network building, technology review/audit;
- **Intellectual property:** Commercialisation, funding opportunities, matching researchers with the needs of companies.

6.2% of university revenues come from R&D contracts with companies

How Technology Transfer Works in TTÜ Mektory?



Cooperation with: ERICSSON

- **R&D projects** - 3-5 up to 10 years
- **TTÜ Mektory projects with students** - max 1 year
- **TTÜ Mektory building** - Ericsson demo-centre, 4G, 3G, WIFI testing ground
- **Studies/education** - Lectures, developing degree programmes, educational programmes for entrepreneurs
- **Lab investments**
- **Activities and events with students** - Conferences, job shadow days, students join Ericsson`s internal career fairs, company tours, brain-storming evenings
- **Technology trainee programm** - 8-month internship with salary for most talented students
- **Internship of scientists** - Scientists work part-time at Ericsson
- **Entrepreneurship competitions for school children**

Science and education are a part of company's innovation!

National initiative: Support for Applied Research in Smart Specialisation Growth Areas

Areas supported: all smart specialization areas

- **Funding** upto 2 M€ with support rate from 50-70% for applied research and 25-45% for product development (depending of the size of the company)
- **Evaluation** is based on the number and performance of cooperation projects of R&D institutions
- **As a result** of product development, companies can have the prototype of their product/service tested in the operational environment, elaborate and qualify systems and test the product/service in the actually existing form in the operational environment.

Some examples of cooperation

CybExer Technologies (Applied Research of the Technical Aspects and Threat Vectors of Cyber Hygiene)

Thinnect (Development Plan Smart Environment Networking Technologies)

Guardtime (Development of BLT signature infrastructure)

Thermory (Applied Research of the demand based saw material production optimization model)

Principles for creation of spin off's

Spin-off is **private legal entity**

The founder is **university staff member**

The company is based on:

- **TTÜ R&D results or know-how**
- **company uses TTÜ labs in its activities**

The ownership of TTÜ **will be decided case-by-case**: if the spin-off is based on TTÜ invention then the ownership of the TTÜ is at least 10%.

A few examples of spin-offs in TTÜ:

- **Crystalsol GmBH** – development of solar cells
- **IVEX Lab OÜ** - DNA expression construct cloning and mutagenesis, focus on lentiviral-mediated expression
- **SafeToAct** – development of affordable high fidelity simulation models for training image guided interventional procedures

Participation policy

- In order to fulfil the objectives of the university, it can either participate or establish legal bodies (technology development centres, professional and trade associations and spin offs).

- TTÜ is participating as a shareholder, partner or member of **58 different** trading companies, NGOs, foundations.

- Innovation and Business Centre coordinates the establishment of TTÜ's legal entities, bureaucratic procedures and supervises all the related actions.

ADAPTER – a joint platform for companies

Contact point to meet the requirements of entrepreneurs with the competence and technologies of all universities!

The first aim: technology transfer

To bring together scientists, students and entrepreneurs; solve practical product development problems and generate new intelligent ideas!

TTÜ Mektory methodology

- Companies' R&D staff
- Supervisors from University who are responsible for project success
- Students from different faculties as **interdisciplinary** project team members

All team meetings together with company

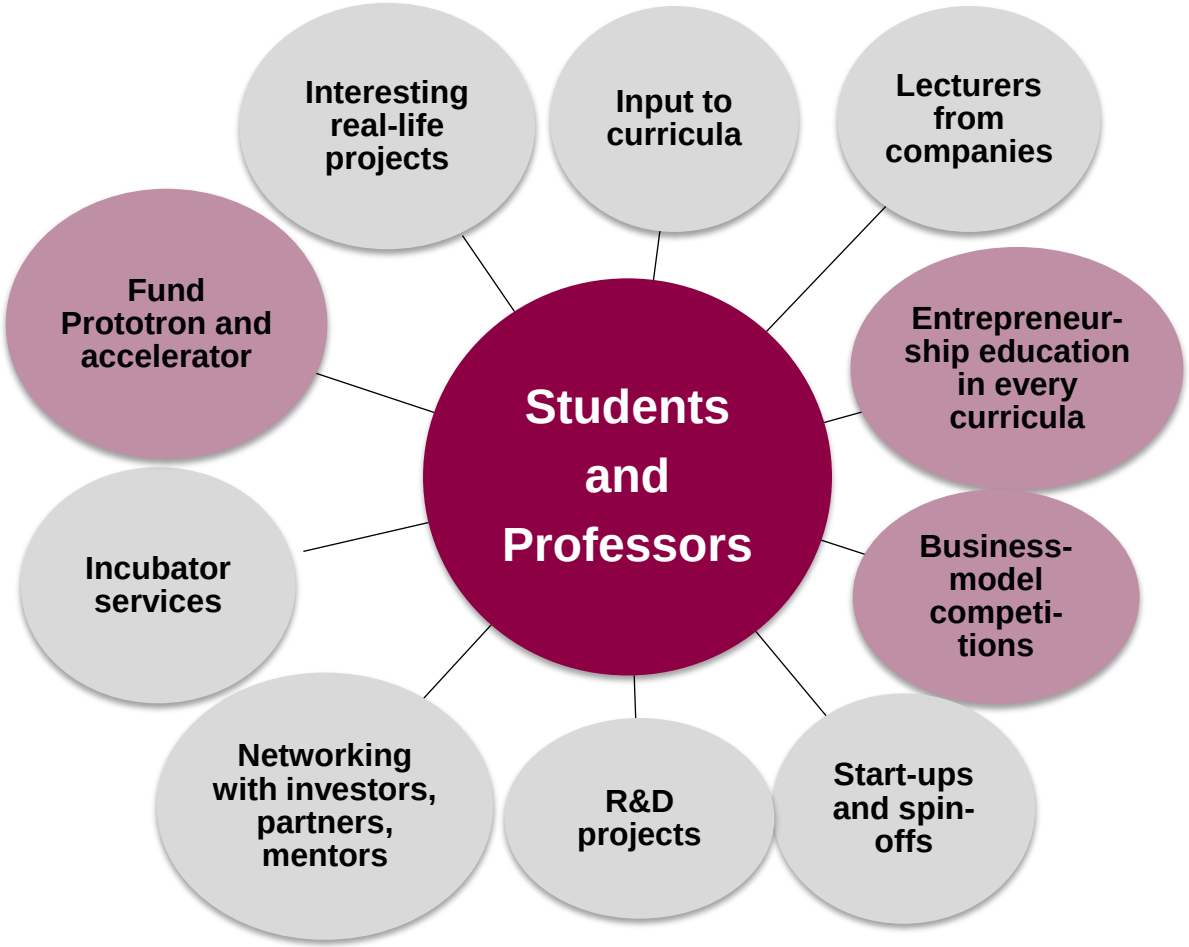
Mentors (among scientists and alumni)

Equipment operators who assure operational safety

Outcome – TTÜ Mektory's R&D project finished in 4 to 8 months
At least 30 projects every year

The second and the third aim: support student activities

- To tie theoretical studies at the University with the practical side
- To prepare better-trained engineers with an experience of cooperation with companies.
- To encourage student's **start-up companies** and professor's **spin-offs** to move forward



TTÜ Mektory Start-up Programmes

YOUTH START-UP PROGRAM „BRIGHT MIND“

- **Target group:** all students from middle and high-schools all over Estonia, teachers, parents and local entrepreneurs
- **Skills and knowledge of the start up world** for students
- The program ends with youth **start-up competition**
- **450 students** and **40 teachers** from **12 counties** has taken part in the Bright Minds programme this year
- Bright Minds Finals April 21, 2017
- Sponsor – Swedbank, support by European Social Fund, Tallinn Enterprise Board, Veebimajutus.ee, Zoombook, Lux Express.
- **Next step:** joining start-up pre-incubation program!

PRE-INCUBATION PROGRAM „STARTERtech“

- **Target group:** all students from Universities, Applied Science Universities, Vocational Schools
- A 4-month start-up idea development program - **trainings**, **lectures** and **workshops** and e-courses on Youtube.com
- **Financed** by EU Funds, **sponsored** by companies and Tallinn Enterprise Board
- **Mentors from companies, coaches from TTÜ**
- Evaluation of the start-up **team and idea development**
- **Next step:** start-up competitions and incubators
- Start-up pre-incubation for Advanced teams will start on February 20, 2017

START-UP COMPETITIONS

- **Target group**: all student start-up teams
- **Technology** oriented ideas
- There has been **7 competitions** in six years including - **26 different nationalities,** over **1000** participants and more than **250** new business ideas
- **Mentors** from companies**, coaches** from TTÜ
- **Business angels** and **investors** and **mentors** in Jury
- **Great prizes** include - room in Mektory, Study Trips, International Competitions
- **Next steps:** Prototron Fund, Ajujaht Competition, incubators, accelerators
- **Next start-up competition in December 2017**

INCUBATION ACTIVITIES

- **Target group:** start-up teams from the competition or pre-incubation
- **Free office** in Mektory Centre
- Participation in **trainings and lectures,** information about different financing opportunities
- **Supporting activities** (laboratories, meeting rooms, technical support, advice)
- Possibility to meet and get introduced with **investors, funds, international delegations**
- **Possibility to mentor**, coach and train others – students, school children and teachers
- Mektory is a **link** between **investors**, **accelerators** and **incubators**

Circle of Successful Start-up in Mektory

Idea
Students from different faculties:
IT, mechatronics, economics, electronis

Mentoring and coaching

A great one-pager

Finalists of the competition in 2013!

Free office in Mektory

New product development

Growing sales and export

Partnership with University

Now coaching others

coMODULE

- Established in 2013
- Started with TTÜ-Formula1 *and weldless batteries.*
- *Now developing (semi-) autonomous electric bikes with Ford and Baidu.*
- *Participated in University Mobile Challenge 2014*
- Founded by Startup*Bootcamp*

www.comodule.com

Start-up companies in Mektory

There are 7 start-up companies in Mektory

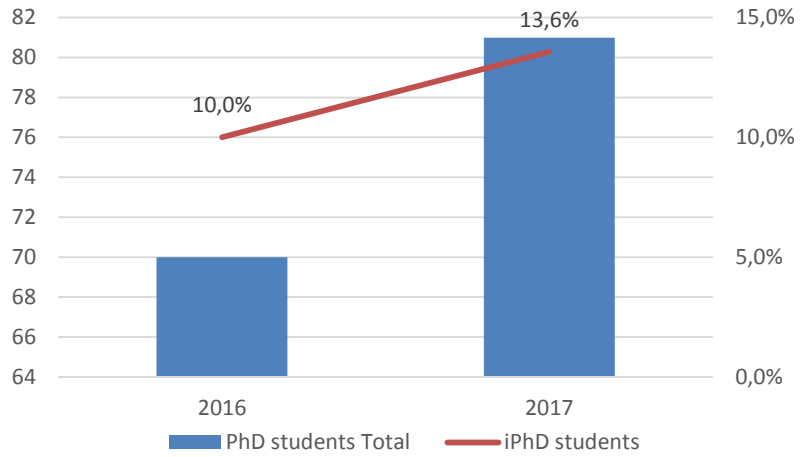
- **3D Academy** provides ideas on how to combine your everyday work with a innovative and exciting world of 3D printing.
- **Smart Load Solutions (SLS)** is creating new cloud based service, which reduces electricity bills and increases electricity sells revenues by optimizing and shifting load according to the day-ahead prices. (smart electricity)
- **Lainergy** is developing a mobile ocean wave energy converter (energy converting)
- **FusionPedal** – creates a guitar pedal system, which helps guitarists to focus on making music (music equipment)
- **Lawtitude** ^{Tech} – law consulting for start-ups (law)
- **Foxcademy** – education platform for highschools (education technologies)
- **Avionica** is making flying drones safer (aviation technolgies)

Industrial PhD at TTÜ

An Industrial PhD is a industrially focused research project and PhD education which is carried out in collaboration between a company, an Industrial PhD candidate and a university.

- An Industrial PhD student is employed in the private sector company and enrolled at the university.
- The student is hired by the company and receives a wage during the entire Industrial PhD project.
- The student shares her/his working time between the company and the university, and spends most of the work time on the Industrial PhD project.
- Expected duaration of the project is 4 years

Industrial PhD- s at TTÜ



There has always been the need for industry driven PhDs.

During 2008-2011 a national trial programme for supporting iPhD-s.

Admission of industrial PhD-s must be increased. We expect at least 15 % of admission to be iPhD students.

Prototron Fund and Science Park Tehnopol Startup Incubator

- In 2012, Swedbank, **Tallinn University of Technology** and Tallinn Science Park Tehnopol founded Prototron fund to support business ideas
- Prototron is the first fund in Europe granting equity free funding to startups so they could build their first working prototype to test on customers.
- Prototron gives seed funding **5000 - 10 000€ for start-up idea.** In 5 years 500 000€ has been given to over 41 new ideas focusing on: electronics, mechatronics, greentech, ICT
- Prototron supports **TTÜ research teams** whose applications are based on **inventions of TTÜ** with up to **50 000€**. The applications will be evaluated by the expert committe who will make the final financing decision
- In 2016 The Harry and Reba Huge Foundation supported the with 50 000$.

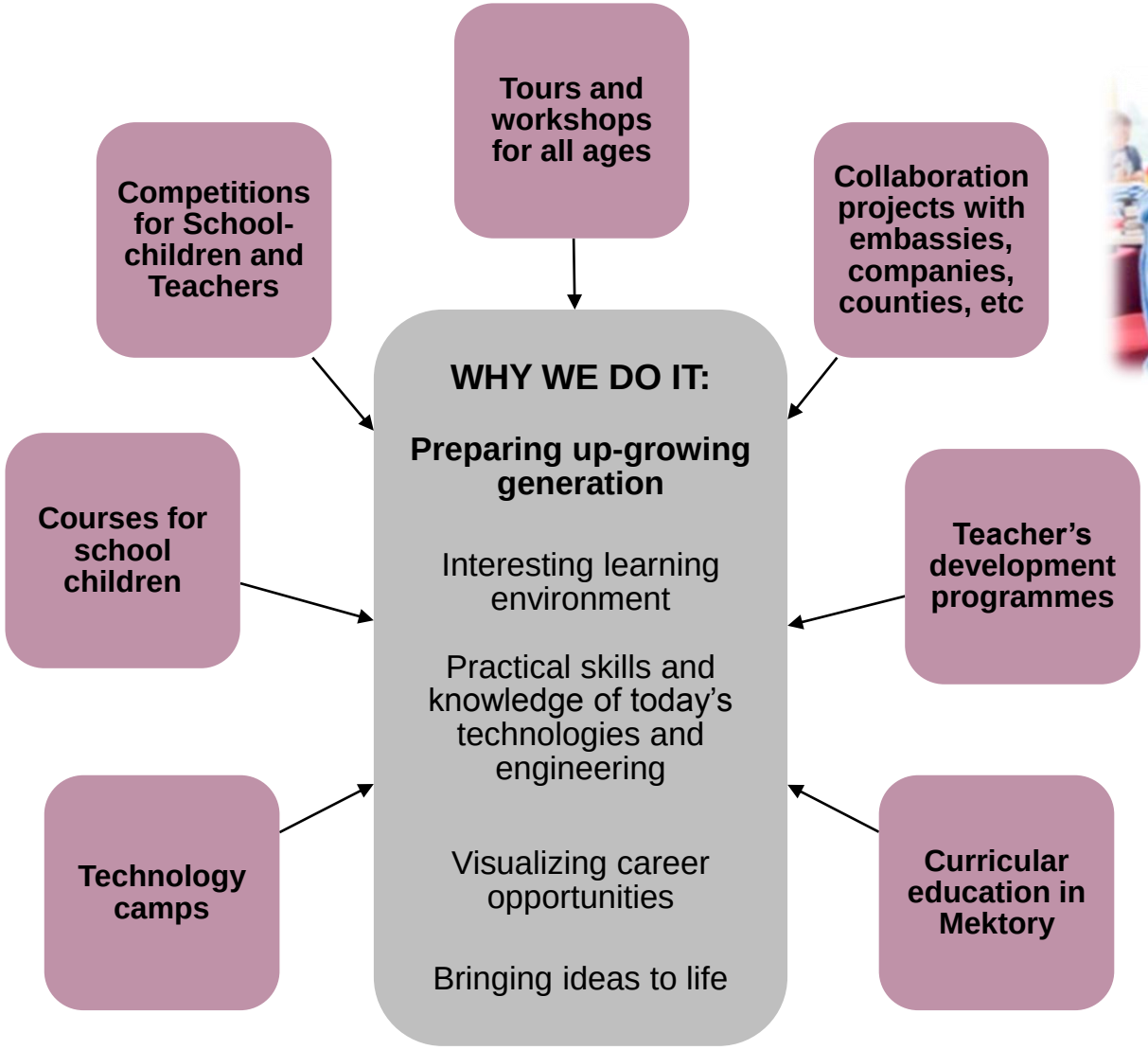
Sciencepark Tehnopol Startup Incubator

- 32 start-up companies
- Targeted at tech companies
- Rental spaces, business development services
- Network of contacts
- Start-up events

The fourth aim: activities for school-children and teachers

TUT MEKTORY
SCHOOL OF TECHNOLOGY

To support the up-growing generations and school teachers: to show that engineering is exciting, feasible and down to earth; to prepare entrepreneurial and ambitious future students.



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TEADUSE POPULARISEERIJA 2016

School of Technology received national recognition for populizing science

TALLINN UNIVERSITY OF TECHNOLOGY

Thank You!