FRUCT Conference

7-11 November 2016

Samsung IoT vision

Svetlana Yun
Tizen Ecosystem Part
Regional Business Lab

Introduction

Samsung R&D Centers Network

5 059 patents in USA registry (#2 in the world)

Technology R&D

🇺🇸 San Jose 1,2, Dallas	🇨🇦 Toronto	🇸🇪 Stockholm	🇬🇧 Cambridge, Middlesex
🇵🇱 Warzawa	🇷🇺 Moscow	🇺🇦 Kiev	🇮🇱 Tel Aviv 1, 2
🇯🇴 Amman	🇧🇷 Campinas	🇮🇩 Jakarta	🇧🇩 Dhaka
🇯🇵 Yokohama1, 2	🇵🇭 Manila	🇮🇳 Bangalore, New Delhi, Noida	
🇨🇳 Suzhou, Nanjing, Guangzhou, Beijing, Tianjin, Xi'an, Shenzhen			

Design Centers

🇺🇸 San Francisco
🇬🇧 London
🇨🇳 Shanghai
🇯🇵 Tokyo
🇮🇳 Noida

On January 2016 г.

Samsung Digital City

SAMSUNG

Digital R&D Center

Telecomm. R&D Center

Suwon HQ

DMC R&D Ce...

Area

1.72mil.m²

Female
5,000

R&D
20,000

Foreign
700

Human
Resources

31,000

Samsung R&D Institute Rus

Mobile
- IT and Mobile
- Virtualization
- TIZEN

Consumer Electronics
- Consumer Electronics, TV
- Printing SW Group

Algorithm Lab
- Graphic Solution
- Recognition & Interaction
- Intelligent Data

Advanced Device Lab
- Optics
- Antennas
- EM & Materials
- Energy
- Health
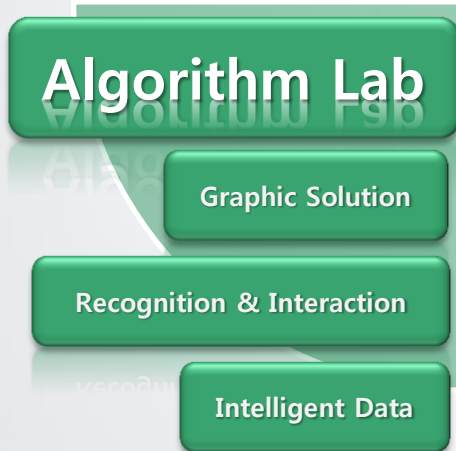
SAIT-Russia Lab
- Optics
- Photonics
- Simulations

Local Business Lab
- B2B
- Tizen Ecosystem

Founded in Moscow in 1993

SAMSUNG ELECTRONICS in Russia

Samsung Electronics – regional HQ, Moscow

Samsung R&D Institute, Rus

Plant and Logistic center, Kaluga region
- Founded in 2008 year
- Investments - 200 млн.$
- > 2 000 workplaces
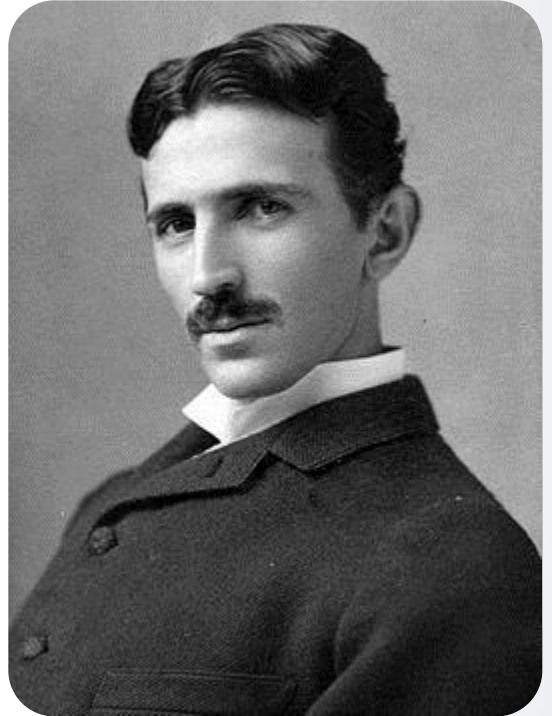- Produce 100% TV and displays sold in Russia

Samsung for IoT

Dreams…

Nikola Tesla, 1926

"... When wireless is perfectly applied
the whole earth will be converted
into a huge brain, which in fact it is,
all things being particles of a real
and rhythmic whole... A man will be
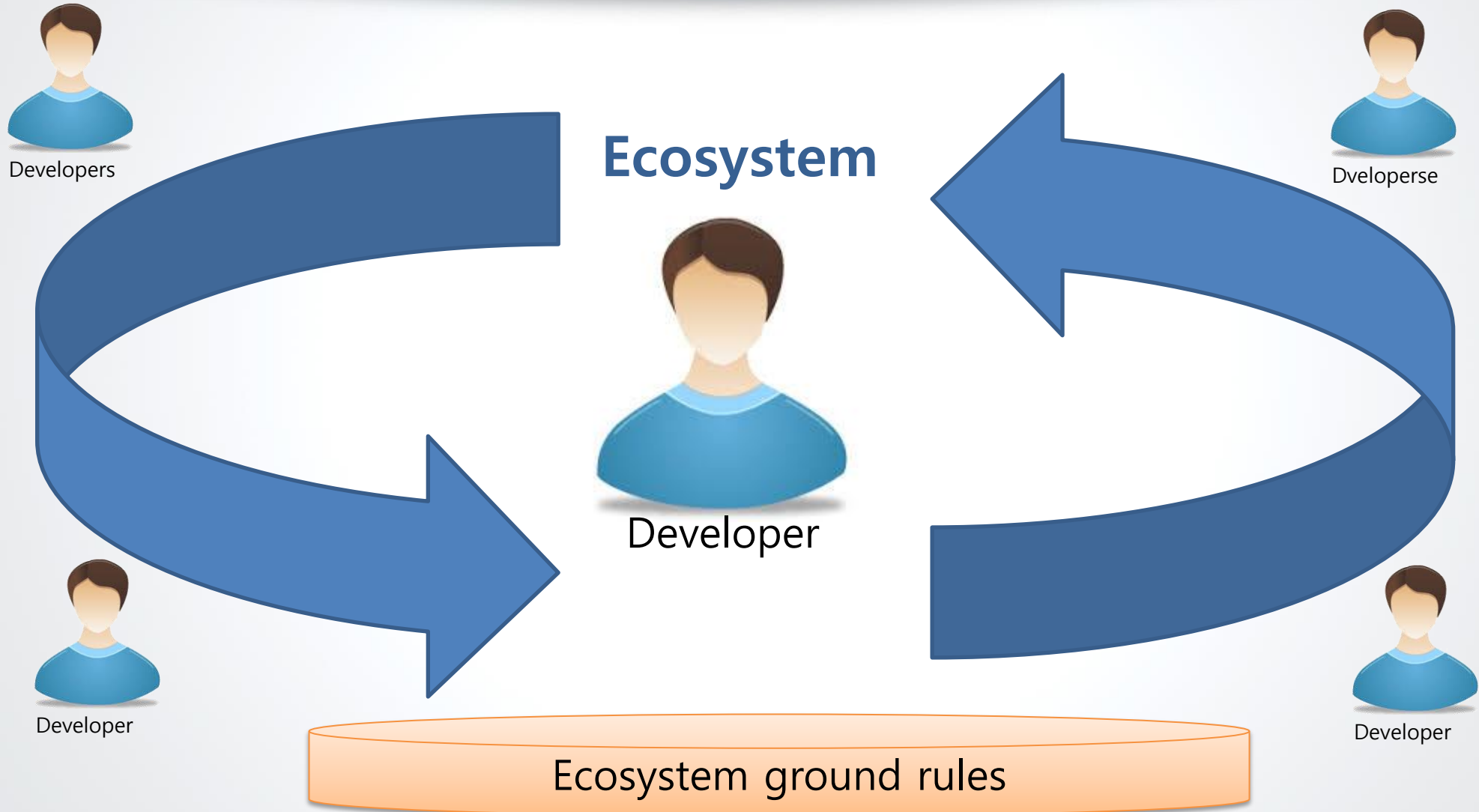able to carry one in his vest pocket
…"

What is IoT?

- ## What defines the term "Internet of things»?

Possibility to provide data transmission where before it was technically impossible or not profitable

- ## Why today?

- ## What this means for engineers and developers?

IoT - Why now?

Significant technology changes have come together to enable the rise of the IoT:

- **Cheap sensors** – Sensor prices have dropped to an average 60 cents from $1.30 in the past 10 years.

- **Cheap bandwidth** – The cost of bandwidth has also declined precipitously, by a factor of nearly 40X over the past 10 years.

- **Cheap processing** – Similarly, processing costs have declined by nearly 60X over the past 10 years, enabling more devices to be not just connected, but smart enough to know what to do with all the new data they are generating or receiving.

- **Smartphones** – Smartphones are now becoming the personal gateway to the IoT, serving as a remote control or hub for the connected home, connected car, or the health and fitness devices consumers are increasingly starting to wear.
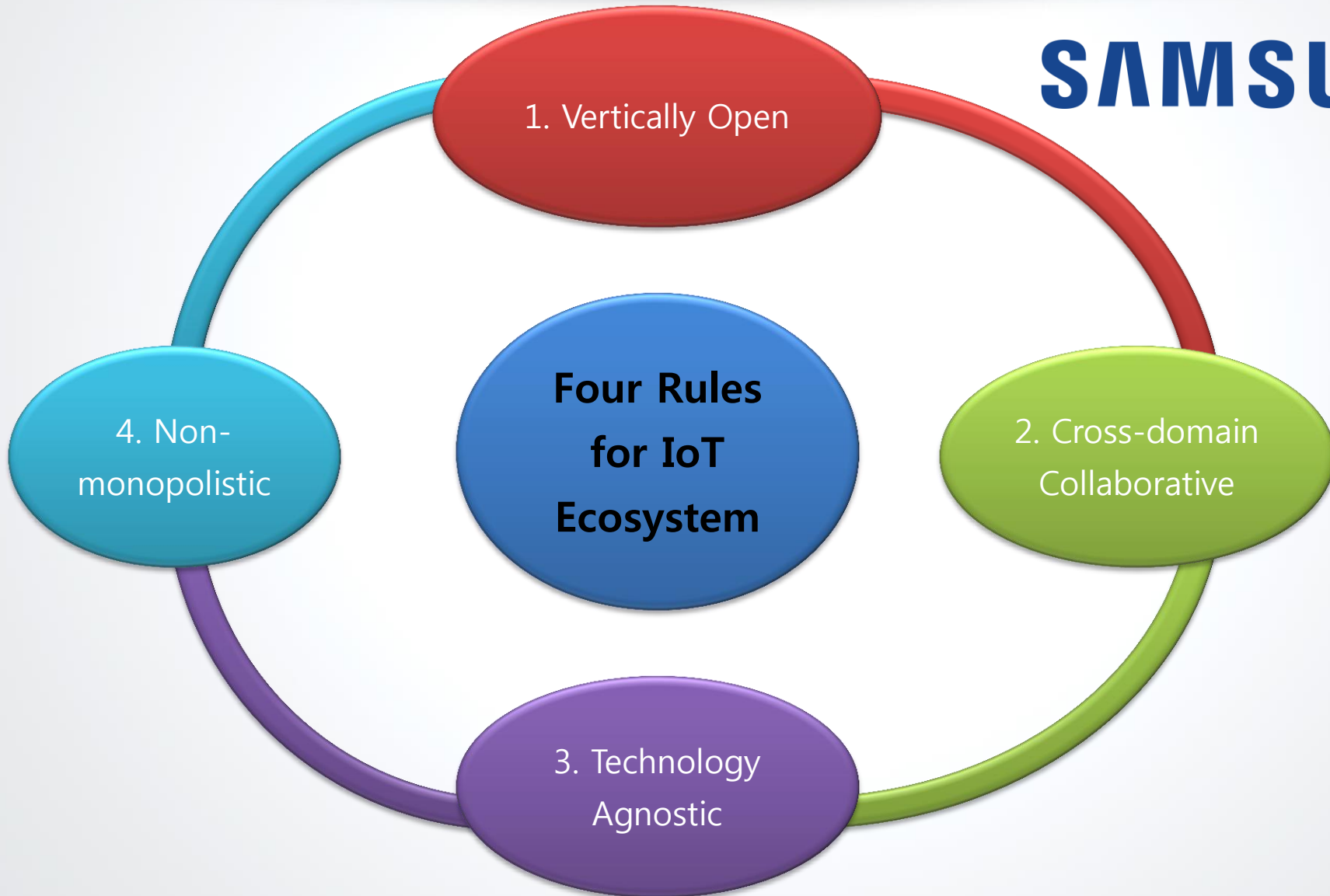
Goldman Sachs Report, Sept 2014

IoT world for developers

Developers

Dveloperse

Developer

Developer

Ecosystem

Developer

Ecosystem ground rules

Ecosystem ground rules

1. Vertically Open

Four Rules for IoT Ecosystem

2. Cross-domain Collaborative

3. Technology Agnostic

4. Non-monopolistic

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How Samsung IoT stack helps developers?

Tradition IoT solution
development

Development with
Samsung IoT stack

Tradition IoT solution development
System test
Application development
Cloud connectivity
Network software
OS/RTOS
Hardware design

Business logic

Development with Samsung IoT stack
System test
Application development
OS/RTOS
Hardware design
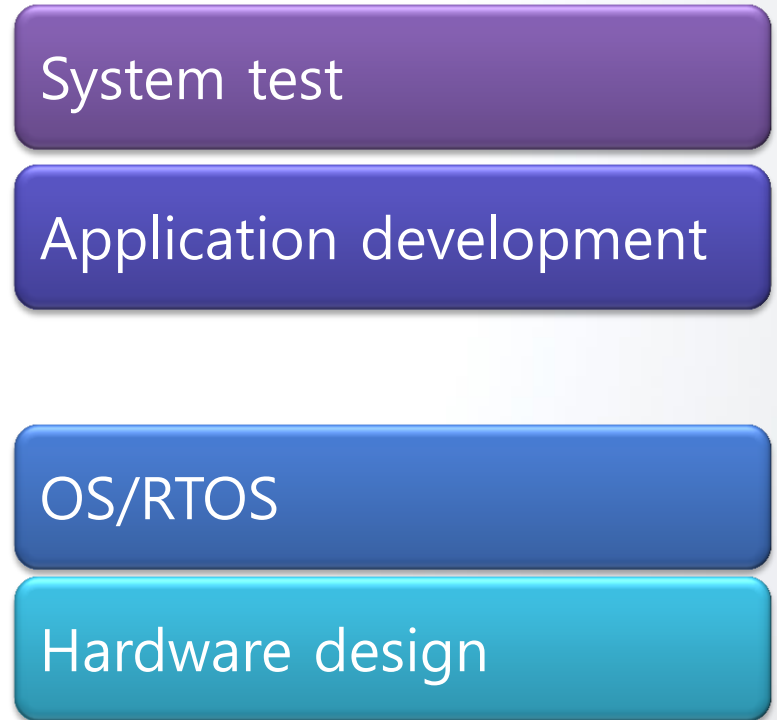
- Solution from "box"
- Reducing the time of development
- Focused on Business purpose

Choose your blocks of IoT stack!

More then 380 partners
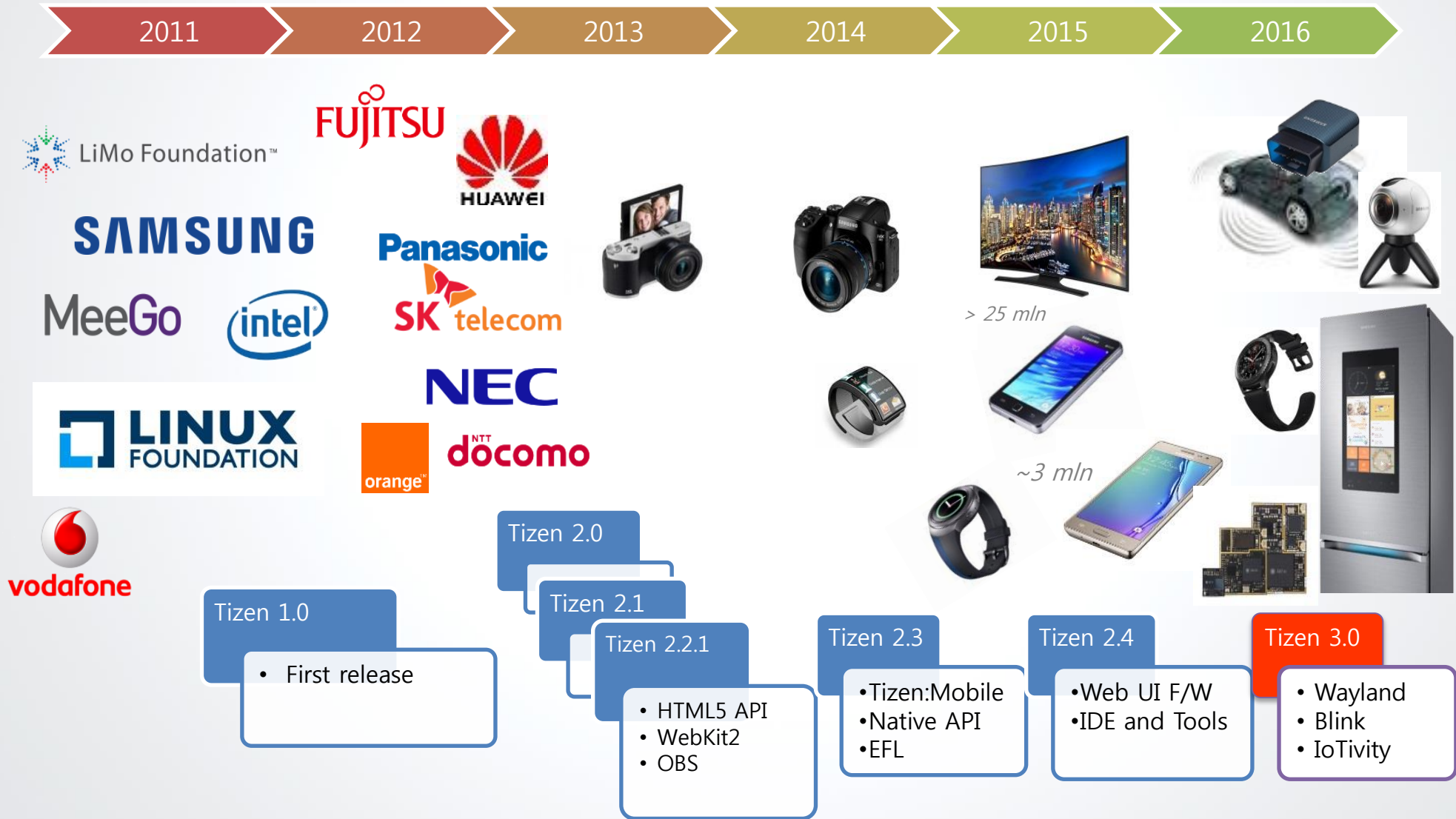
Samsung IoT Ecosystem

ARTIK
- 100+ Partners
- Technical Partnerships across the stack
- Joint Business Development Efforts

TIZEN
- 110 members
- Hosted by Linux Foundation
- Governed by Tizen Association

IoTivity
- 170+ OCF Members
- Diamond, Platinum and Gold members
- Academia and Non-profits

Tizen OS evolution

2011 — 2012 — 2013 — 2014 — 2015 — 2016

LiMo Foundation™
SAMSUNG
MeeGo   (intel)
LINUX FOUNDATION
vodafone

FUJITSU
HUAWEI
Panasonic
SK telecom
NEC
orange   NTT docomo

> 25 mln

~3 mln

Tizen 2.0

Tizen 2.1

Tizen 1.0
- First release

Tizen 2.2.1
- HTML5 API
- WebKit2
- OBS

Tizen 2.3
- Tizen:Mobile
- Native API
- EFL

Tizen 2.4
- Web UI F/W
- IDE and Tools

Tizen 3.0
- Wayland
- Blink
- IoTivity

New in TIZEN 3.0

Mobile Profile	IVI Profile	TV Profile	PC Profile	Additional ...
Tizen Common Libraries				

- ➢ New graphical manager - Enlightenment 19
- ➢ The new browser - Chromium-efl
- ➢ Support for multi-user mode
- ➢ The new architecture of security, using the SMACK
- ➢ The new authorization framework Cynara
- ➢ The Linux kernel has been updated to release 4.0
- ➢ Added frameworks for Bluetooth and WiFi
- ➢ Integration with framework IoTivity 0.9.2

Tizen API

IoTivity

Cynara

Connectivity

Security
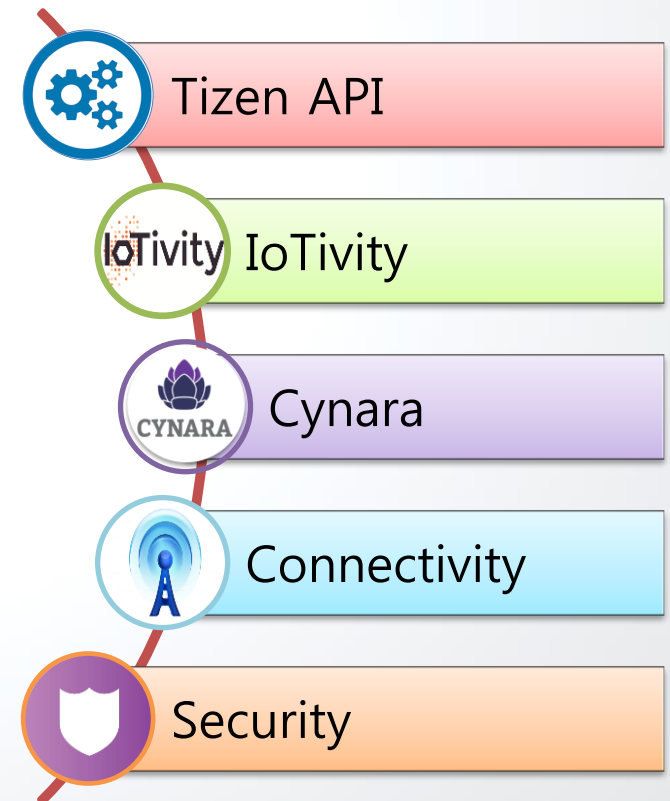
IoTivity framework

- Founded by Leading Technology Companies (170+) including Cisco, General Electric, Intel, MediaTek & Samsung
- Defines standards for connectivity requirements
- Ensures interoperability of billions of IoT devices.

- An open source software framework implementing OIC Standards
- Ensures seamless device-to-device connectivity to address the emerging needs of the Internet of Things.

ARTIK – SAMSUNG IoT Modules

https://artik.io/

ARTIK 7-10 family

| High Quality Video App. | Local Cloud | Smart TV | Drones |

ARTIK 5 family

| Smart Watches | Camera | Home Appliances | Home Hubs |

Bluetooth® – ARTIK 020
ZigBee® – ARTIK 030
Thread® – ARTIK 030
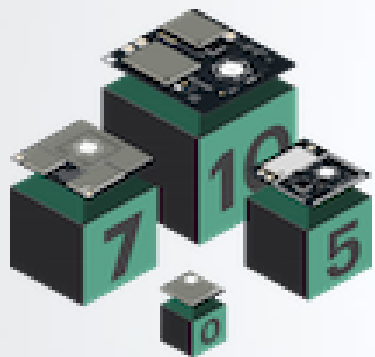
| Agriculture | Smart Lighting | Supply Chain | Wearable Bands |
| Smoke Sensors | Door Lock | Leak Detection |

ARTIK Security

Proven security technologies
Combining hardware and software security

Application Security

- Easy to use Secure Pairing & Anomaly Detection

Platform Security

- Trusted Execution Environment (Secure OS)
- Secure Boot

Hardware Security

- **ARM**'TRUSTZONE'

Secure Element

End to End Solution for IoT Products Prototyping

ARTIK 5-10 development kit box:

- ARTIK module mounted on a development board assembly

- Wireless communication antennas (2 or 4 of these, depending on series)
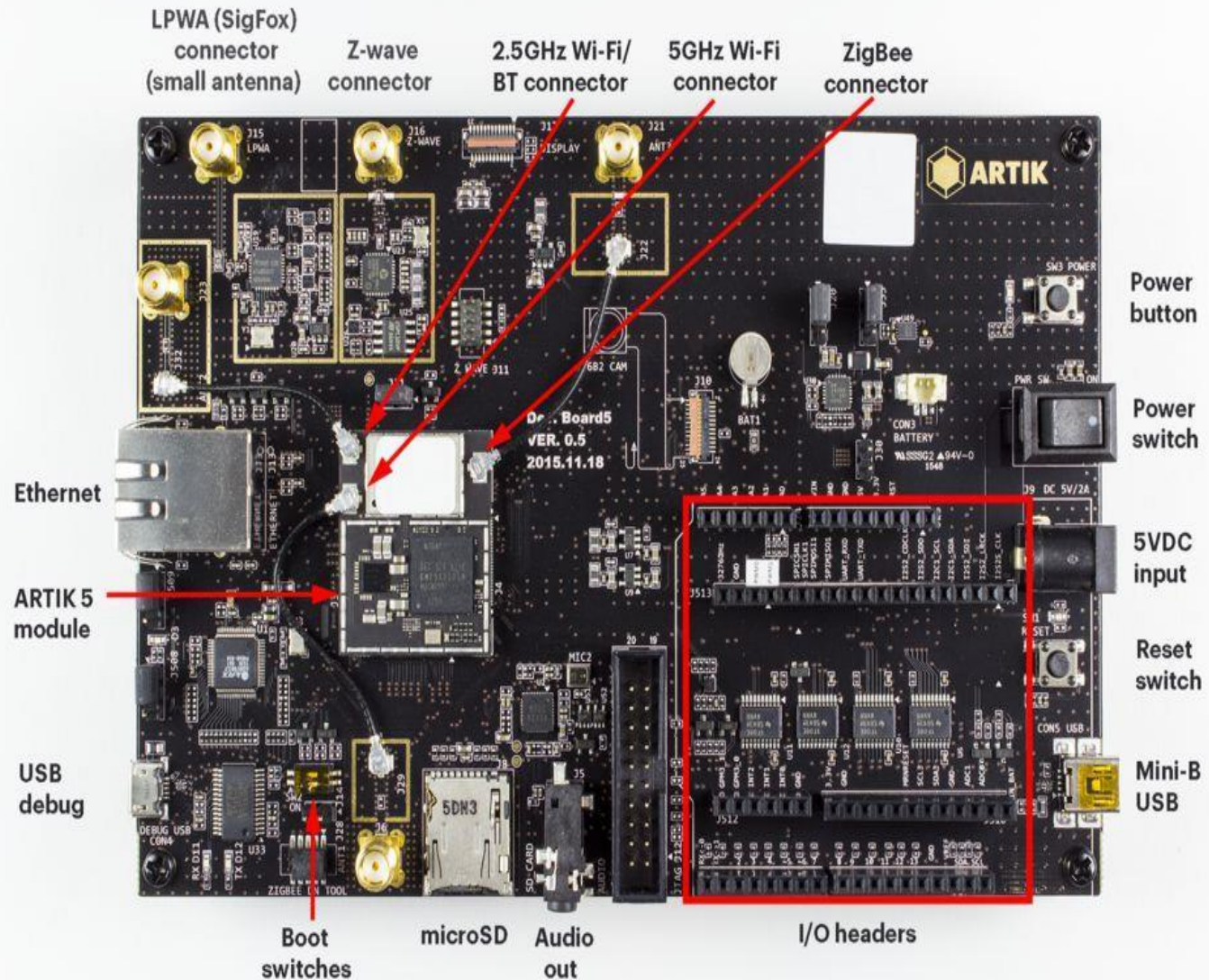
Accessory Boards

- **MIPI camera** – SIP-ASRNX004
  Fits directly on MIPI CSI port, 5 Mp
- **Sensor board** – SIP-ASRNX001
  Plugs onto Interface board

  - 4 external I^2C ports
  Sensors:
  - 6 axis STM (3 accel., 3 gyro)
  - MEMs pressure (LPS25HB)
  - Humidity/Temperature (HTS221)
  - Hall Effect (S-5712CCDL1-I4T1U)
  - Proximity & Color (CM36655)
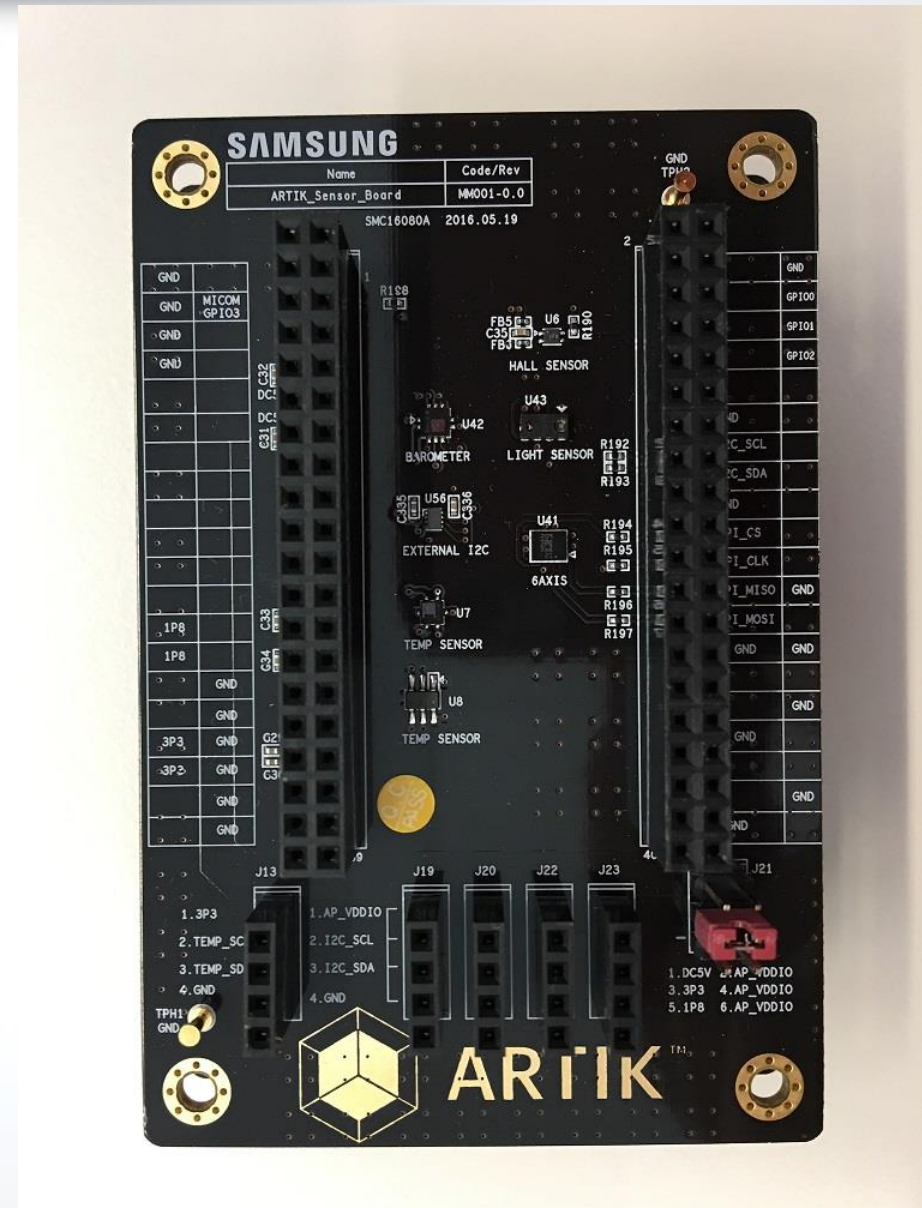
Why am I here?

Tizen in Russian Market - differences

![Ассоциация ТАЙЗЕН.ру]

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➢ Local infrastructure is supported by ISP RAS and Samsung

➢ Moving devices of Russian vendors to Tizen platform

➢ Tizen 2.4 certificated in FSTEC

➢ Trusted smartphone for B2B market with certificated MDM (FSTEC) and VPN (FSB) developed by Russian companies
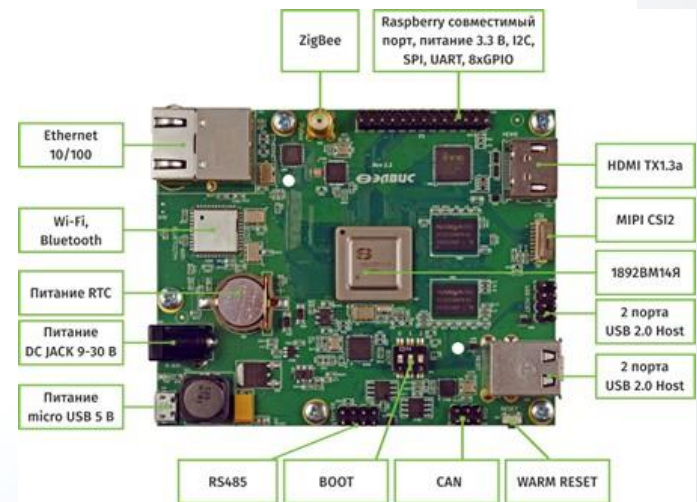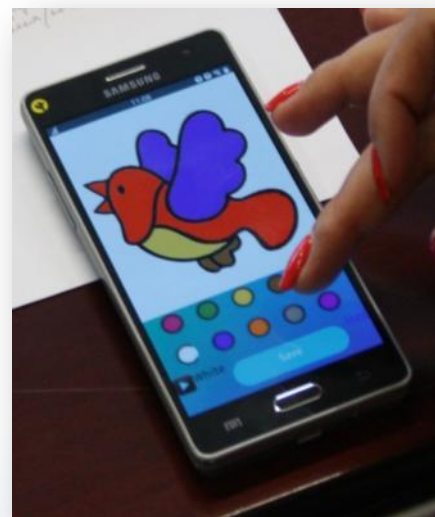
Tizen.ru - Russian Association
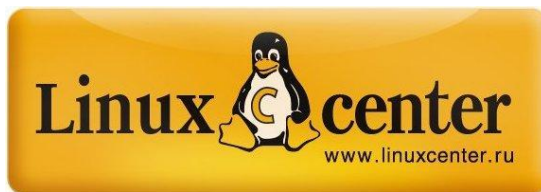
Tizen Internship and Practice

28 students have trained on Tizen summer practice in 2016 in Samsung R&D Institute in Moscow
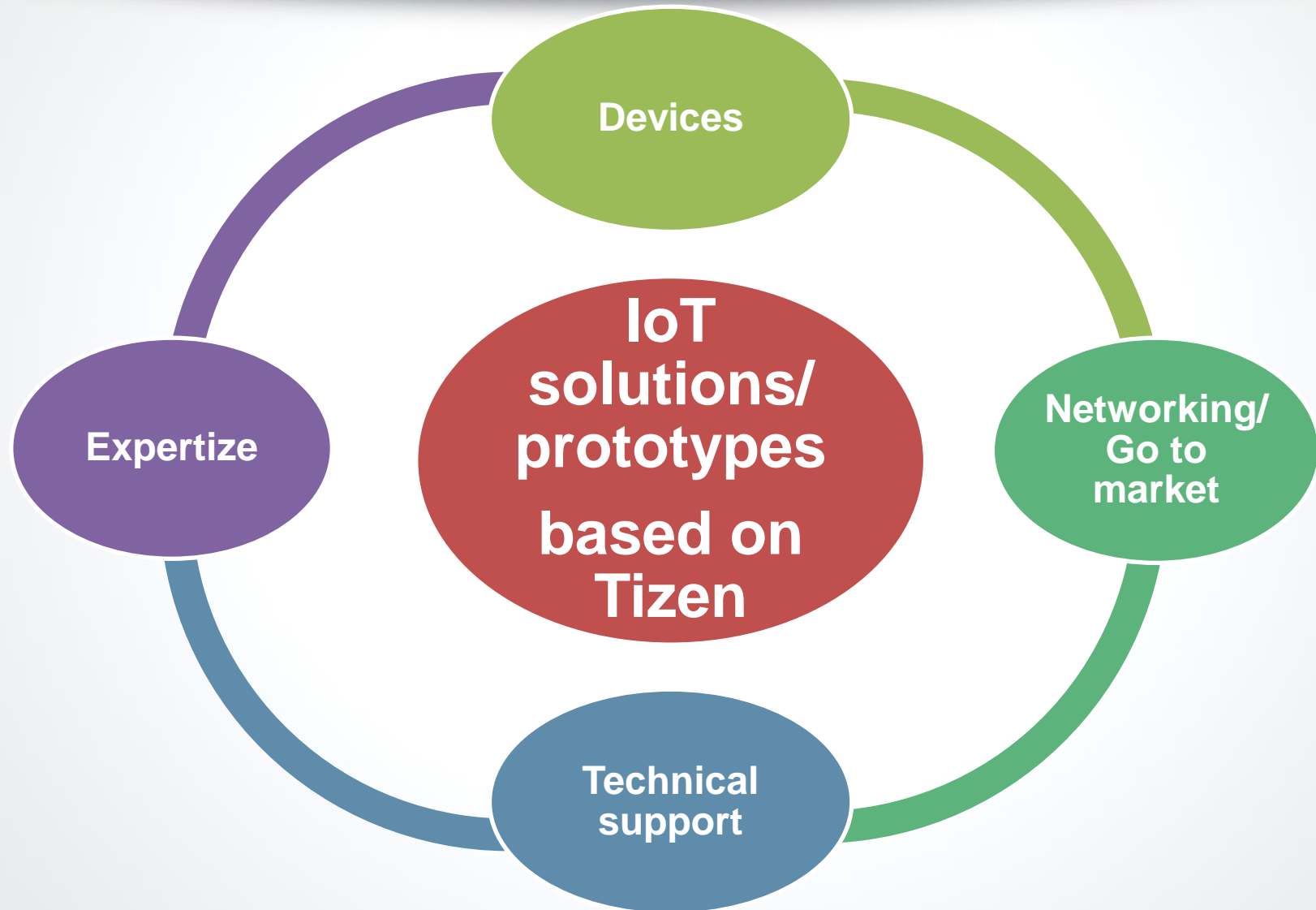
Tizen in Universities
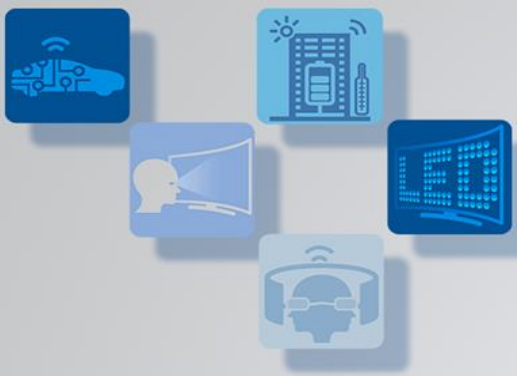
- Bauman MSTU

- MPEI

- KFU

- NSTU

- HSE

We invite Universities to cooperation!

Thank you!

My contacts
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