

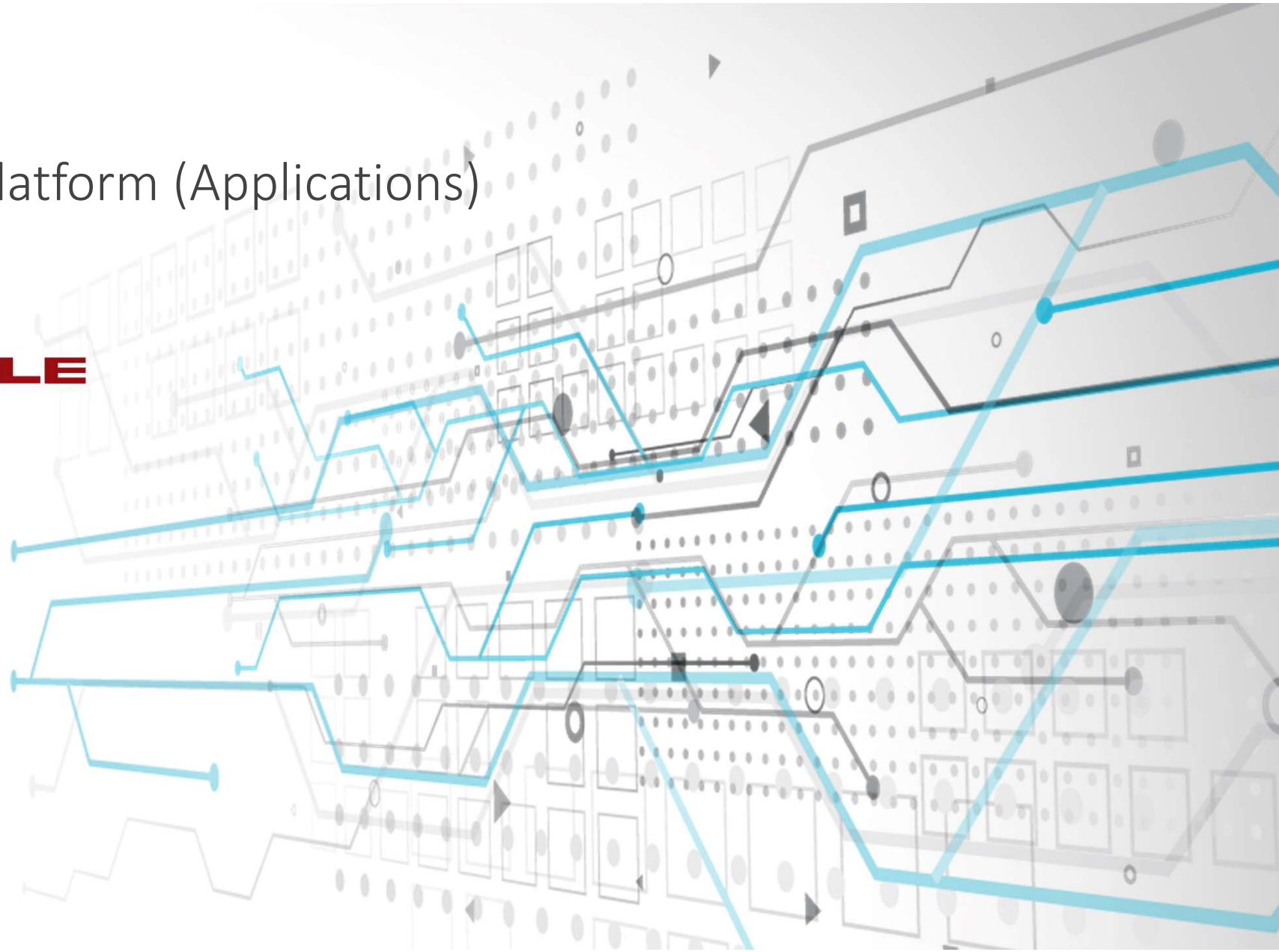
Emtele

Smart City Platform (Applications)



16.08.2019

Erkki Viitala



Agenda



- Emtele Overview
- City Platform Manifesto & Cases
- Smart City Framework
- Technology Evolves
- IoT Landscape & Ecosystem
- Communications
- From data to Knowledge and Actions
- Smart City Platform (SCP) Framework
- Emtele position at SCP

Emtele Ltd.



- Privately owned SME (Tampere)
- 10 yrs 24/7 Smart City Platform (SCP) business for critical infrastructures
- Emtele SCP components as Service:
 - Communication services for critical infrastructure FieldCom
 - Secondary Substation Monitoring and Control MUKE
 - Wireless remote safety (cameras) MASI
 - Video analytics VIHI
 - Process network cyber-security AUWO
 - Fault indicator for Smart Grid VIKE
 - BigData and analytics GridAnalyzer
- Emtele SCP customers in Cities
 - Helsinki (HSV), Vantaa (VES), Turku (TESV), Tampere, Hämeenlinna
 - Sweden, Russia

City Platform Manifesto

(ref: <https://www.tmforum.org/smart-city-forum/city-platform-manifesto/>)



1. City platforms must enable services that improve the quality of life in cities; benefitting residents, the environment, and helping to bridge the digital divide
2. City platforms must bring together both public and private stakeholders in digital ecosystems
3. City platforms must support sharing economy principles and the circular economy agenda
4. City platforms must provide ways for local start-ups and businesses to innovate and thrive
5. City platforms must enforce the privacy and security of confidential data
6. City platforms must inform political decisions and offer mechanisms for residents to make their voices heard
7. City platforms must involve the local government in their governance and curation, and are built and managed by the most competent and merited organisations
8. City platforms must be based on open standards, industry best practices and open APIs to facilitate a vendor neutral approach, with industry agreed architecture models (see below for examples)
9. City platforms must support a common approach to federation of data or services between cities, making it possible for cities of all sizes to take part in the growing data economy
10. City platforms must support the principles of UN Sustainable Development Goal 11: Making cities and human settlements inclusive, safe, resilient and sustainable.

This Manifesto supports the use of Open APIs and common standards, such as those supported by the European Commission's Connecting Europe Facility (CEF) and TM Forum, which offer a direct path to creating an open, flexible and interoperable city platform model.

Smart City Cases

(ref: <https://www.tmforum.org/smart-city-forum/smart-city-case-studies/>)



Smart City Applications



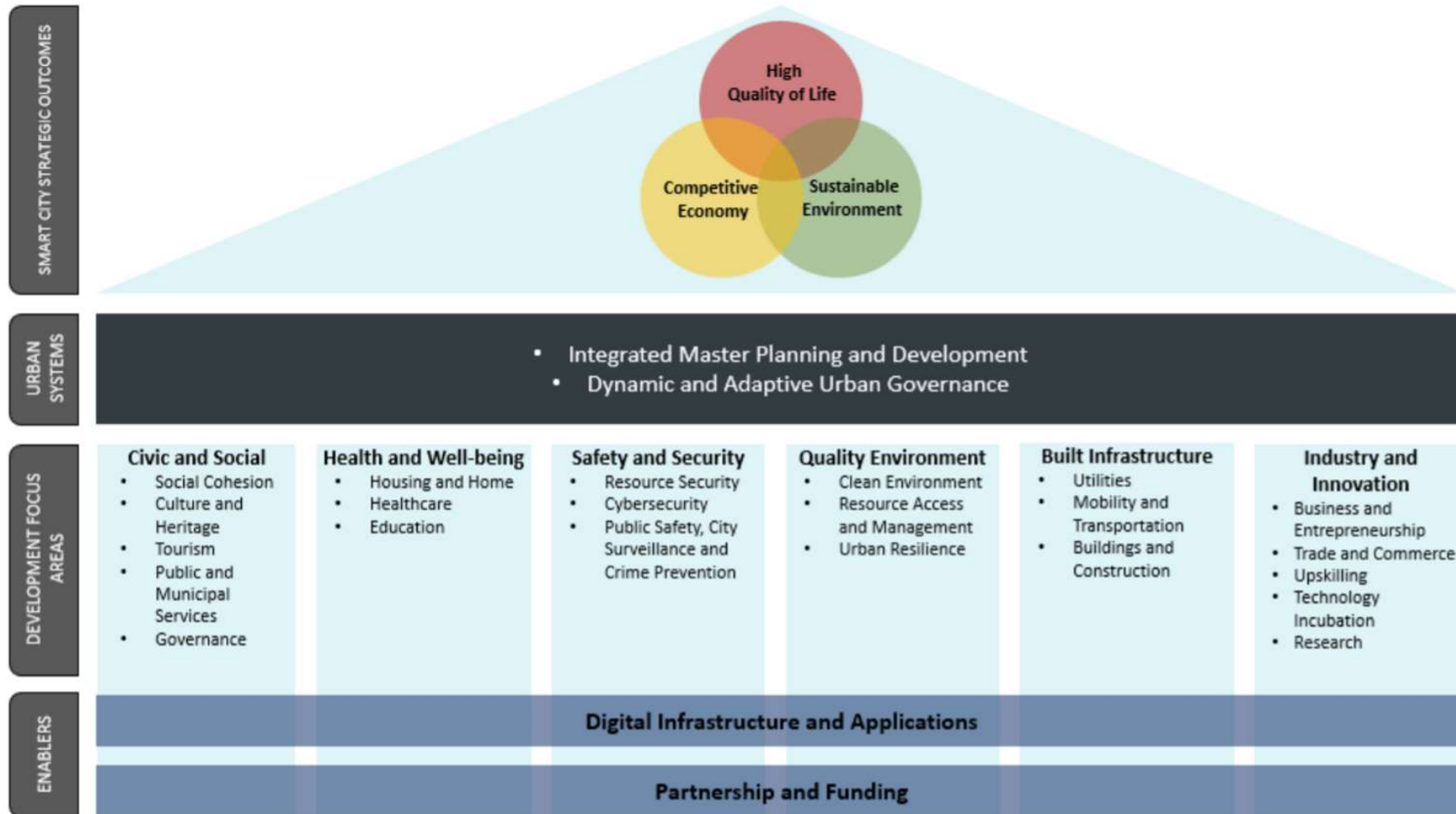
THE RELEVANCE OF IOT APPLICATIONS FOR SMALLER SMART CITIES

	Highly relevant	Can be implemented with certain restrictions	The value is questionable
Traffic management			✓
Parking	✓		
Public transport		✓	
Utilities			✓
Street lightning	✓		
Waste management	✓		
Environment		✓	
Public safety		✓	

<https://www.scnsoft.com/blog/iot-for-smart-city-use-cases-approaches-outcomes>

- <https://www.luxturrim5g.com/>
 - LuxTurrim5G is a Nokia Bell Labs driven ecosystem project developing and demonstrating fast 5G network based on smart light poles with integrated antennas, base stations, sensors, screens and other devices. This joint project opens new digital services and business opportunities for a real smart city.
- <https://www.postscapes.com/internet-of-things-award/smart-city-application/>
 - URBIOTICA designs and develops smart city solutions including parking and noise monitoring.
 - Enevo provides a waste management solution
 - Kiunsys offers solutions for smart city parking, payments and logistics
 - Libelium is a hardware provider offering sensors, motes and gateways along with cloud integration partners
 - Placemeter (Acquired by Netgear) provides a a retail and traffic analytics solution.
 - TZOA uses internal sensors to measure your air quality, temperature, humidity, atmospheric pressure, ambient light and UV (sun) exposure all in one wearable device.
 - EverImpact help Cities track their greenhouse gas emissions in realtime and monetize their reductions with Carbon Pricing Instruments
 - Telsensa smart street lightning
 - BestMile offers an ecosystem to manage autonomous vehicle fleets: a fleet management software, a smartphone application, a system for traveler information and solutions for the control of smart infrastructure

Smart City Framework (ref: <https://asean.org/storage/2019/02/ASCN-ASEAN-Smart-Cities-Framework.pdf>)



Technology evolves...



“In the late 19th century, in less than a hundred years, human creativity has produced steam, gas, electricity, but still no mechanical system to replace horses.”
Pierre Giffard, journalist

- Giffard organized a race for Paris - Rouen 127 km (22.7.1894):
 - Race for vehicles without horses (“intelligent engine” replaced by mechanical”)
 - The cars also had to be safe, easy and cheap to use
 - 102 registered (30.4.1894 mennessä)
 - 76 ei saanut autoa valmiiksi kisaan, yli 20 pääsi karsinta-ajot läpi (n. 20 km/h vauhdilla), 17 pääsi kisassa maaliin
 - 15 km / h was generally considered to be dangerous to human physics, vehicles and outsiders
 - The steam tractor finished first in the race (time 6h48m, 19 km/h) and second kerosene-powered Peugeot (time 6h51m30s)
 - However, the winner was Peugeot, which was the best in driving and easy to use
 - Second, the steam tractor because it was able to pull like a bull and develop unparalleled power, especially uphill

1.



2.



Text SK 31, 2.8.2019

The next claim perhaps could have been:

“In the late 20th century, in less than a hundred years, human creativity has produced powerful mechanical system to replace horses, but still no autonomous vehicles on public roads”

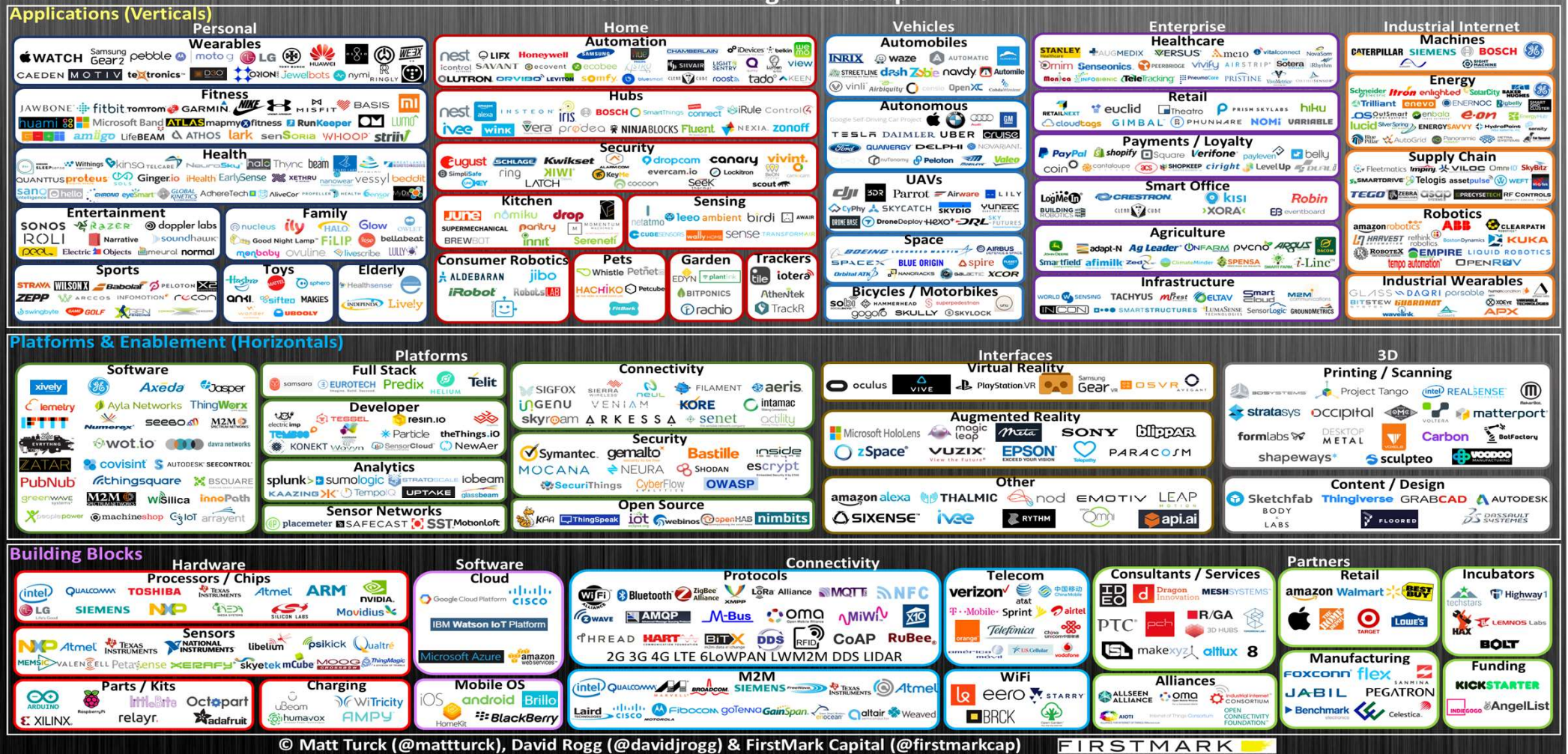
- Experiments have been conducted on self-driving cars since at least the 1920s
- The first self-sufficient and truly autonomous cars appeared in the 1980s, with Carnegie Mellon University

There are Choices for technologies needed

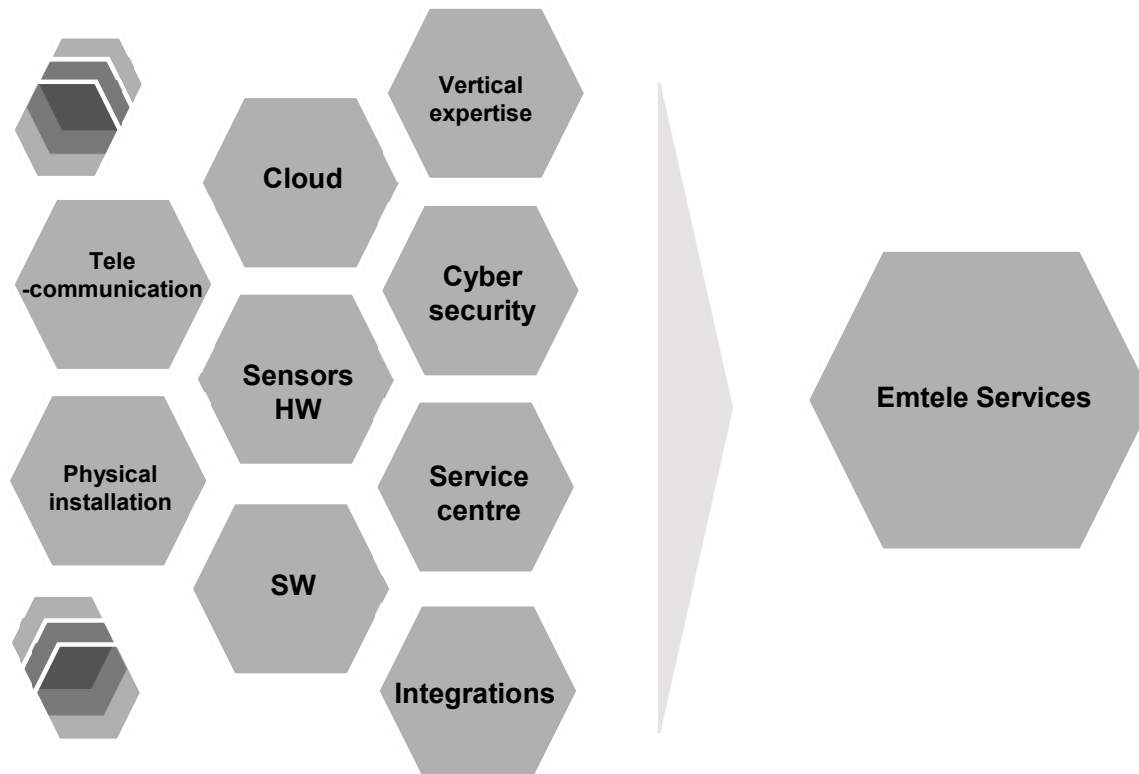


<https://mattturck.com/2016-iot-landscape/>

Internet of Things Landscape 2016



Alone just cannot do it – Ecosystem needed



MULTICLIENT SERVICE PLATFORM HUB AND VALUE ADDING EXPERTISE

Communications needed



- LoRa (and other low speed and energy communications)
 - Normal transfer rate 0,3–50 Kb/s. Data transferred is a few bites.
 - Suitable for sensor/meter data (e.g. el, water) (provided that no SW/FW remote update of devices needed over LoRa).
 - SW/FW remote update depending on the size over 2G/GPRS or better
 - In Finland Digita offers Lora-service (if not own network)
 - https://www.digita.fi/yrityksille/iot/iot_lorawan-verkon_peittokartta
- 5G (high speed)
 - 5G is enabler of huge communication and use of computing capacity and thus basis for building a Smart City.
 - Benefits, e.g. in traffic management
 - https://www.accenture.com/t20170222t202102_w_us-en/acnmedia/pdf-43/accenture-5g-municipalities-become-smart-cities.pdf
 - 5G is now on hype but start maturing
 - Phones already available
 - <https://www.is.fi/digitoday/testit/art-2000006171678.html>

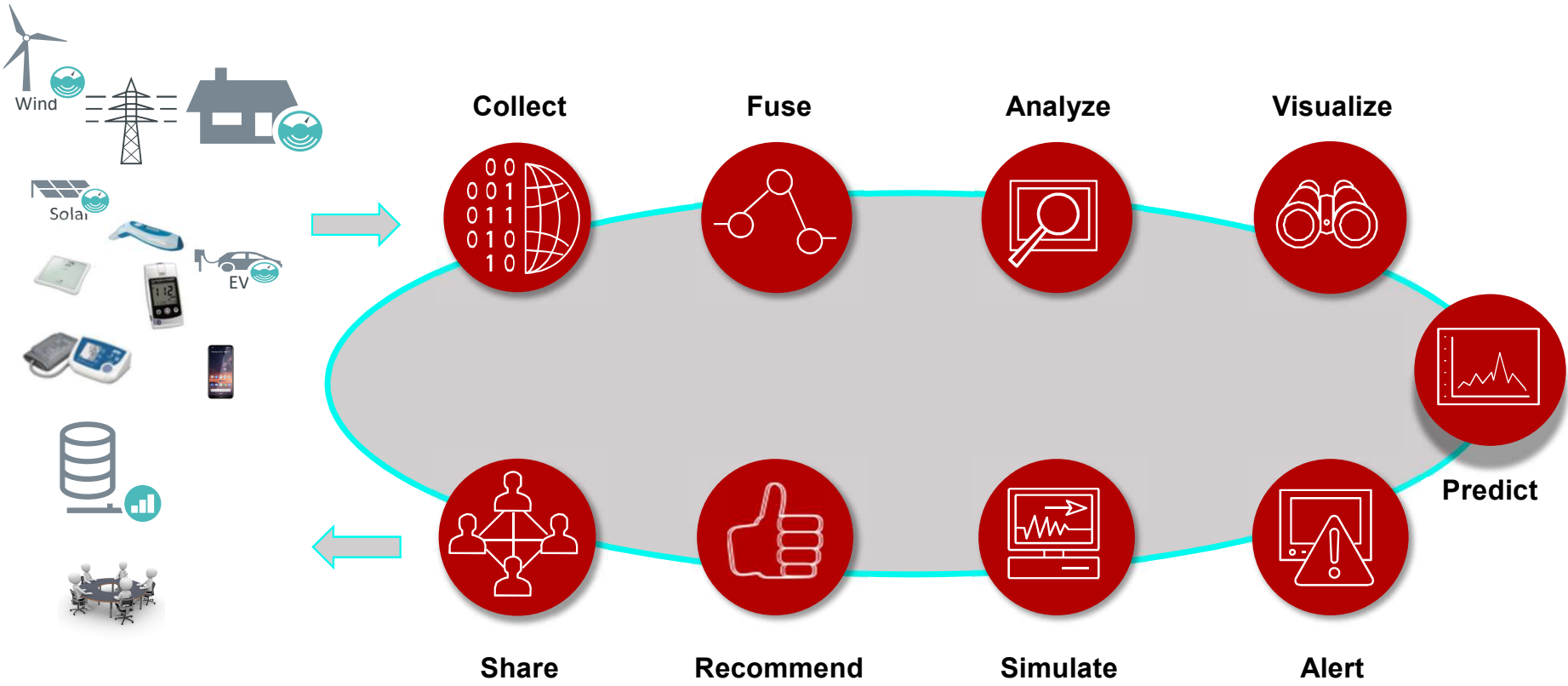
	SIGFOX	LoRa	clean slate	NB LTE-M Rel. 13	LTE-M Rel. 12/13	EC-GSM Rel. 13	5G (targets)
							
Range (outdoor) MCL	<13km 160 dB	<11km 157 dB	<15km 164 dB	<15km 164 dB	<11km 156 dB	<15km 164 dB	<15km 164 dB
Spectrum Bandwidth	Unlicensed 900MHz 100Hz	Unlicensed 900MHz <500kHz	Licensed 7-900MHz 200kHz or dedicated	Licensed 7-900MHz 200kHz or shared	Licensed 7-900MHz 1.4 MHz or shared	Licensed 8-900MHz 2.4 MHz or shared	Licensed 7-900MHz shared
Data rate	<100bps	<10 kbps	<50kbps	<150kbps	<1 Mbps	10kbps	<1 Mbps
Battery life	>10 years	>10 years	>10 years	>10 years	>10 years	>10 years	>10 years
Availability	Today	Today	2016	2016	2016	2016	beyond 2020

5G/Smart City Cases

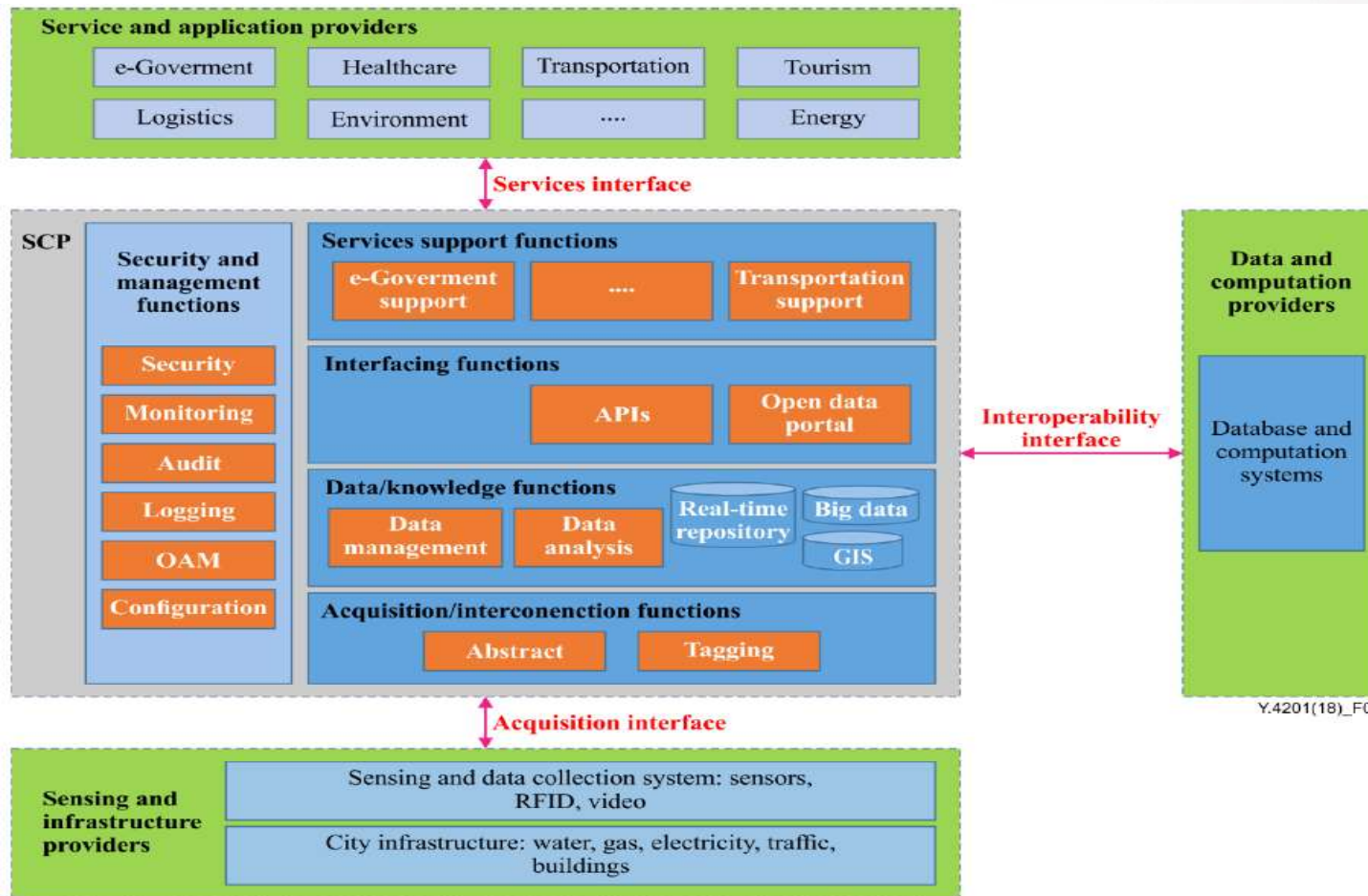
- <https://www.luxturrim5g.com/>
 - LuxTurrim5G is a Nokia Bell Labs driven ecosystem project developing and demonstrating fast 5G network based on smart light poles with integrated antennas, base stations, sensors, screens and other devices.
- <https://www.aamulehti.fi/uutiset/tampere-saa-huippuluokan-mobiiliverkon-ensimmaisena-suomessa-tekeeko-5g-tampereesta-alykaupungin-200348422>
- <https://www.hel.fi/uutiset/fi/kaupunginkanslia/5g-testiymparistoilla-rakennetaan-helsingista-maailman-toimivinta-kaupunkia>
- <https://www.turku.fi/blogit/smart-and-wise-blogi/alykas-turku-nain-syntyy-digiajan-kaupunki-20>
- <https://www.businessfinland.fi/ajankohtaista/uutiset/2017/alykaupunkien-kehityksessa-kova-vauhti-suomessa/>



From data to knowledgebased actions

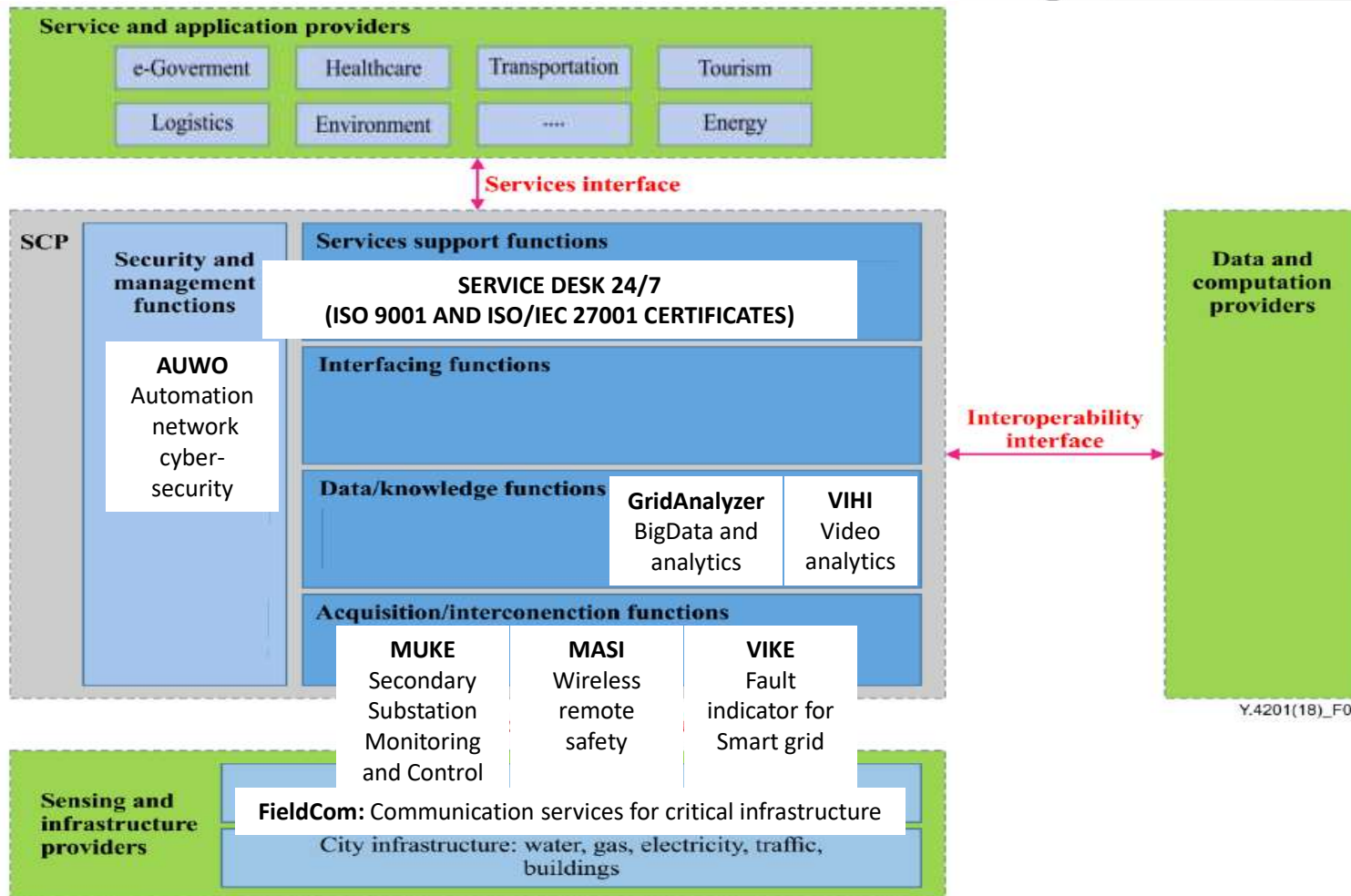


Smart City Platform Framework (by ITU)





Emtele Position at Smart City Platform



The logo for EMTELE features a stylized 'E' inside a red square on the left, followed by the word 'EMTELE' in a bold, sans-serif font. The 'EM' is in black, and 'TELE' is in red.

EMTELE

