

Defragmenting the Construction Industry

Jaan Saar
Head of Digital Construction
Ministry of Economic Affairs and Communications
Estonia



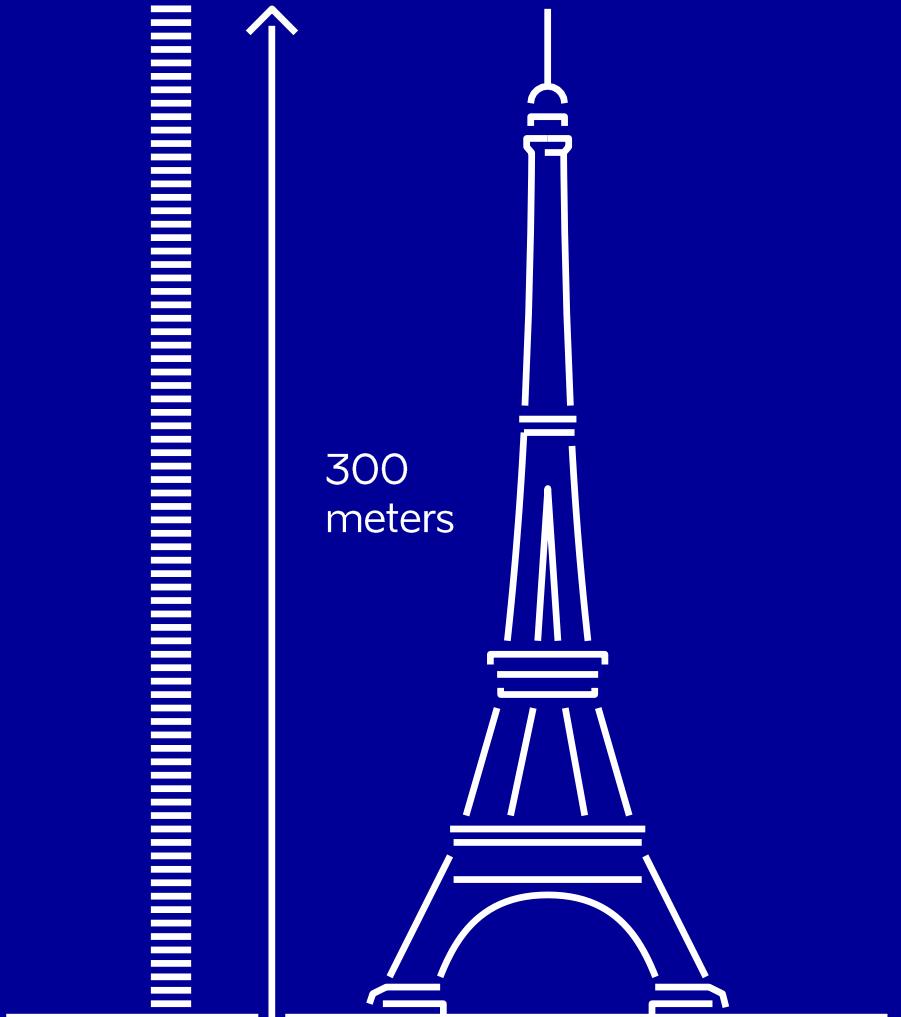
a modest
country that
extends beyond
its borders

- + population: 1.3 million
- + area: 45,339 km²
- + currency: Euro
- + member of: EU, NATO, WTO, OECD, DIGITAL 9
- + ICT sector: 7% of GDP



we are a digital society

- + 'the most advanced digital society in the world' – WIRED Magazine
- + 99% state services are online
- + digital signatures save 2% of GDP
- + a few hours to start a company
- + hassle-free e-taxation



building registry

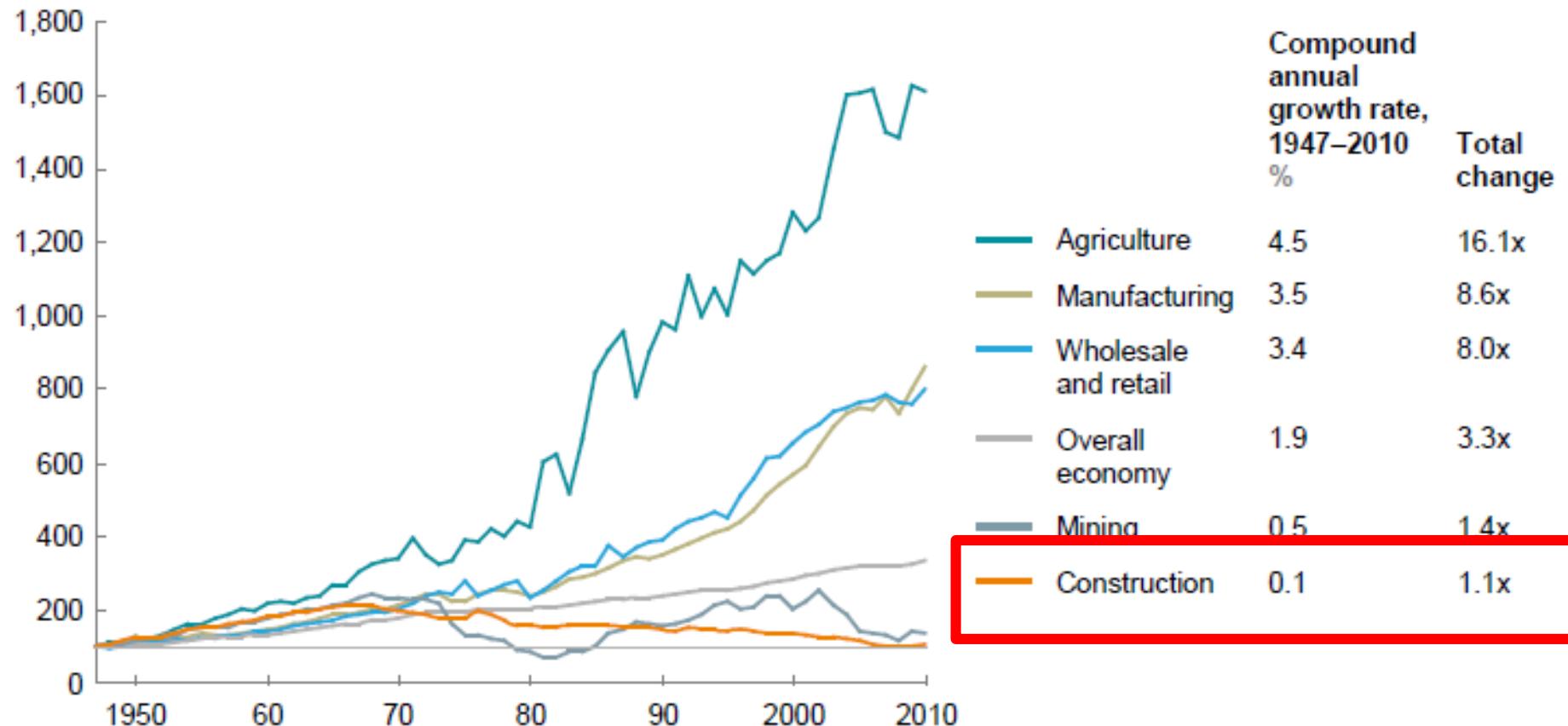
National database for **all buildings**

- + over 3 million data requests monthly via e-government services
- + over 32k procedures handled yearly
- + 400GB database
- + 2.8 million documents

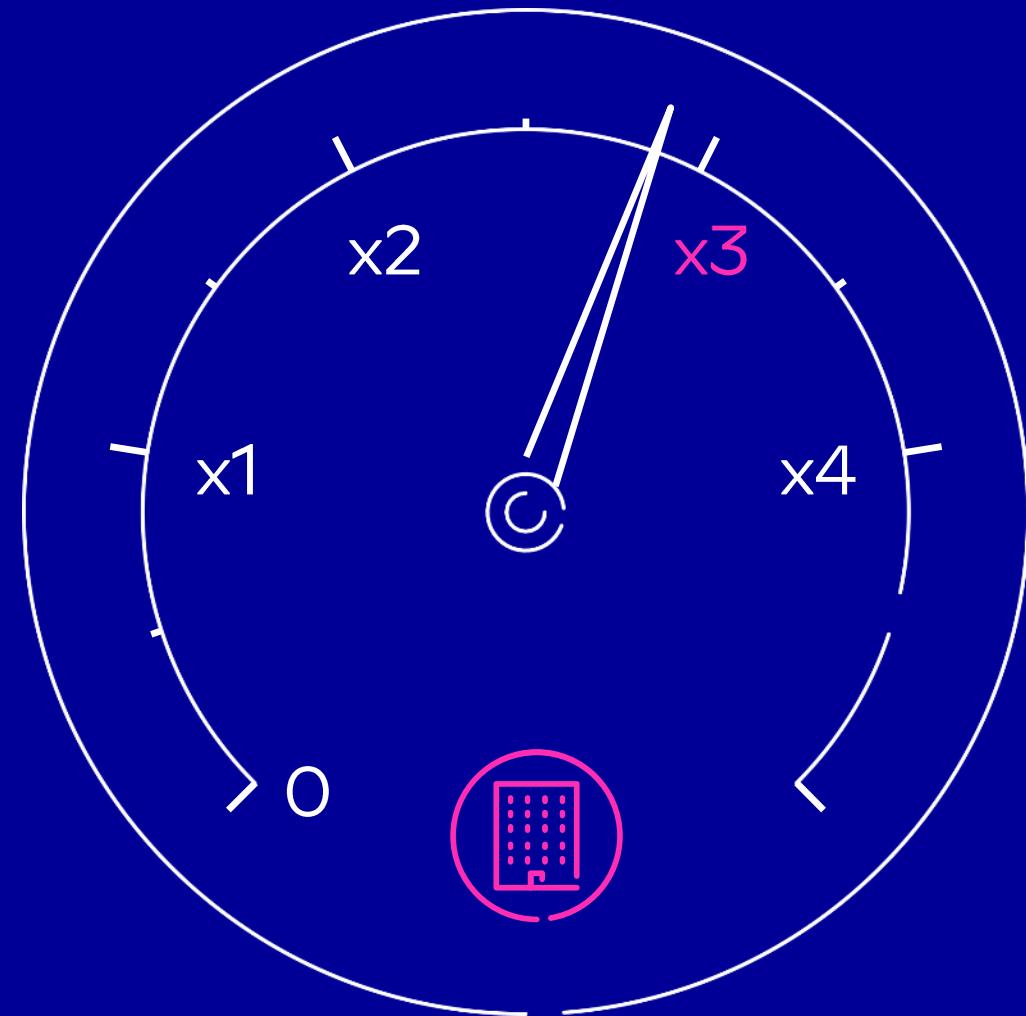
where is the problem?

Gross value added per hour worked, constant prices

Index: 100 = 1947



objective for
construction:
increase
productivity x3



- + Government aims to increase construction sector productivity x3 by 2030
- + Current productivity is below EU average

complexity

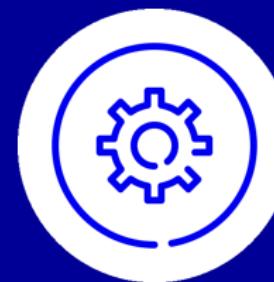
- + Large amount of stakeholders
- + Fragmented nature of the industry
- + Long building lifecycle
- + least digitized

role of government



Legislation

Direct and influence adoption of new solutions using relevant legislation



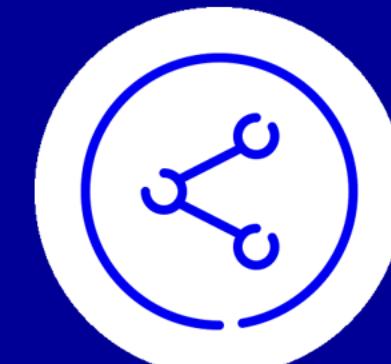
Process improvement

Map and improve existing processes, support adoption of new tools and methods



Education

Develop educational curriculums and government orders to develop skills for innovative



Create the environment for secure and reliable data exchange

[>> e-construction platform](#)

e-construction platform

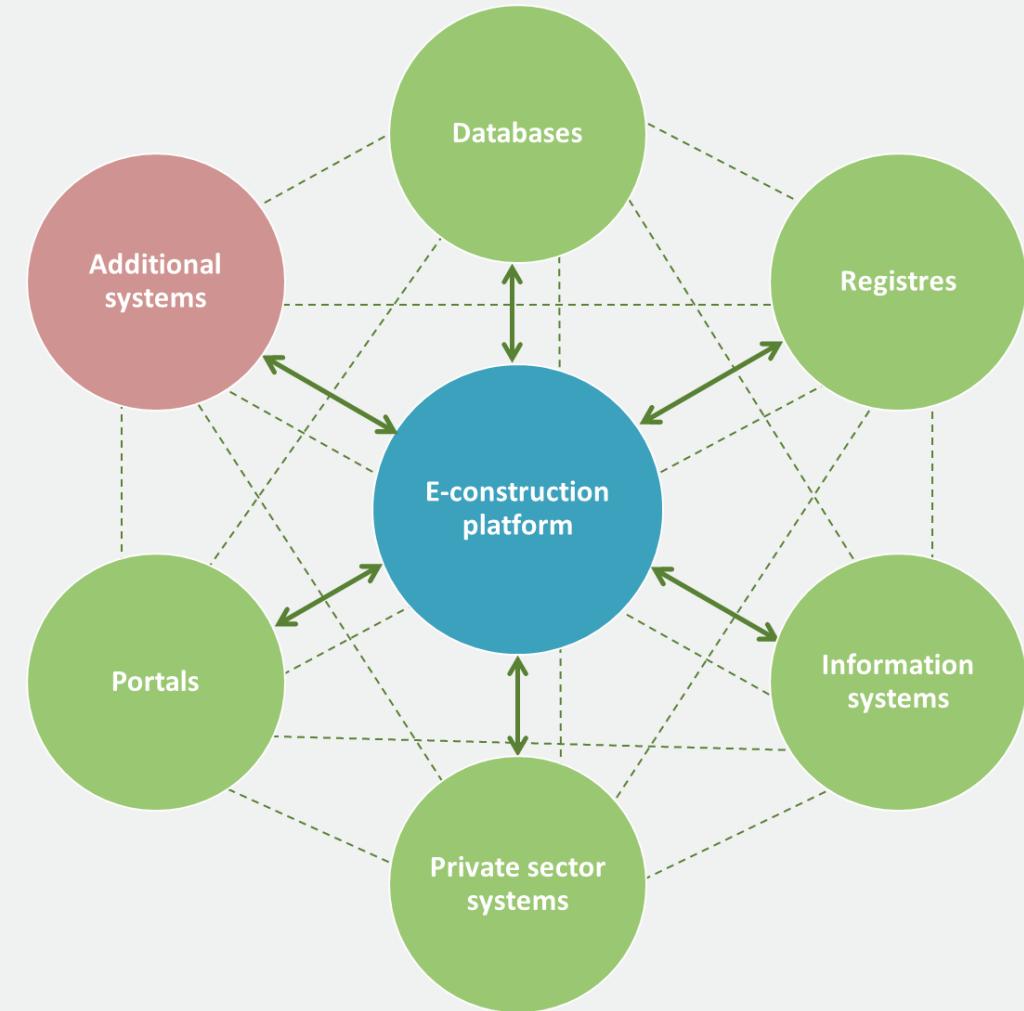
lossless exchange of standardized and trustworthy data between all stakeholders throughout the building lifecycle

- + Better data management = improved decision making
- + BIM becomes the norm
- + more efficient and transparent public processes
- + added value from new digital products and services

integration

connecting **built environment** data
and services without a centralized or
master database

- + using existing e-gov infrastructure (x-road)
- + open platform and API-s
- + secure by design with e-ID authentication
- + KSI blockchain used for integrity verification of
government registries
- + access point to **digital twin**



E-ehitus

<http://eehitus.ee>

E-ehitus

Objektivaade Minu töölaud OÜ Haamer(Mari Maasik) Logi välja

Mida sa täna otsida sooviks?

Otsingukohad: Objektid Teenused Seadusandlus Firmad Uudised [Detailne otsing](#)

Kaardikiht 3D-infomudel Teenused Infomaterjalid

Otsitud objekt: ehitis objektnumbriga #24

Objekt #24:
Nimi: Hotell Tartu
Omanik: Tartu Hotelid AS
Muudetud: 26.08.2018
[Vaata detaile](#)

Salvesta töölauale

[UUDISED](#) [TEENUSED](#) [ABI](#) [LINGIKOGU](#) [KONTAKT](#)

E-ehitus

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Kaardikiht 3D-infomudel Teenused Infomaterjalid

Otsitud objekt: ehitis objektnumbriga #24

Objekt #243:
Nimi: Kandsein
Materjal: betoon
[Vaata detaile](#)

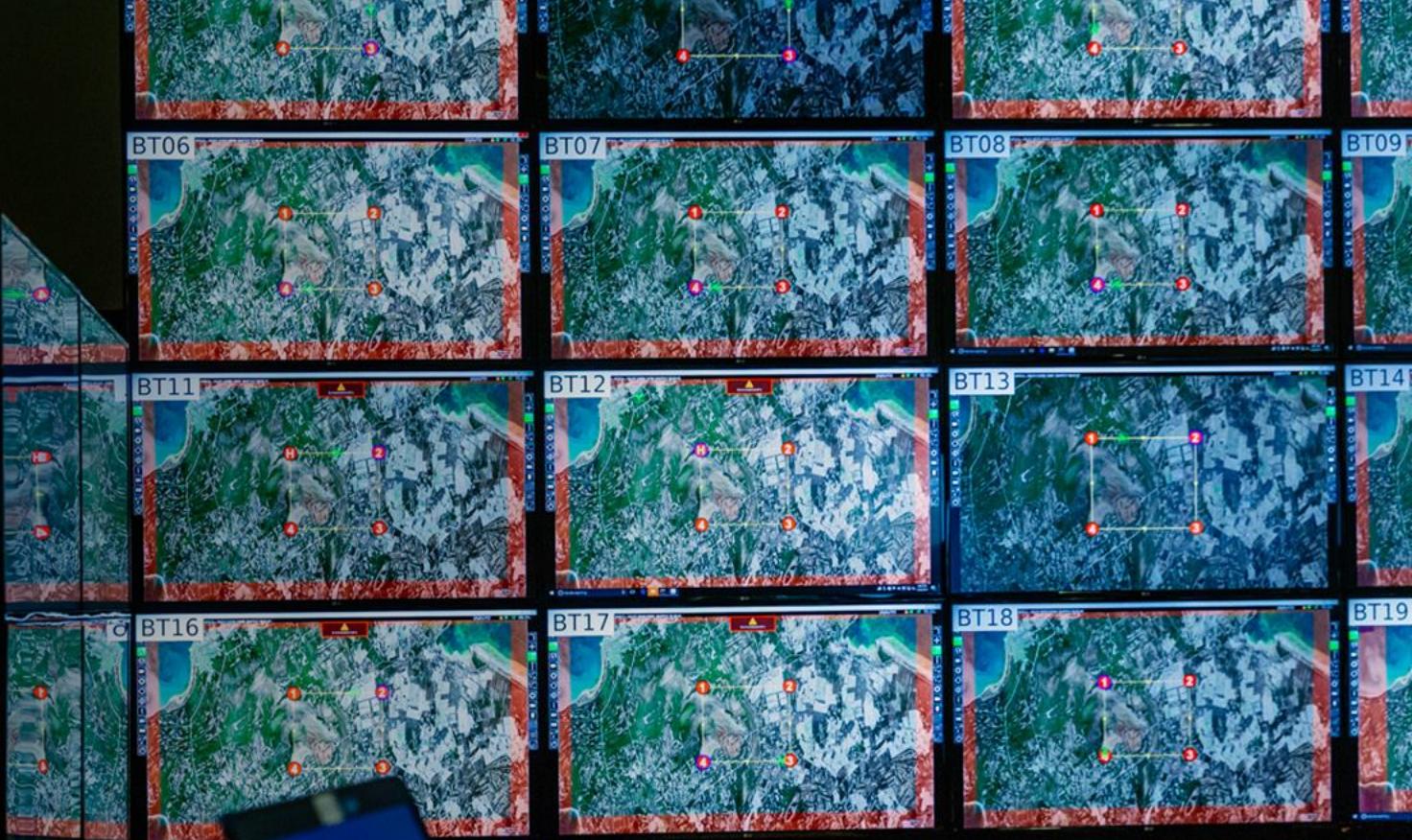
Impordi mudel Eksporti mudel Vaheta versiooni Mööda Tee väljavõte

INFO:
Versioon: 3.2
Muudetud: 26.08.2018
Staatus: Kinnitatud
Projekteerija: Jan Tamm

Salvesta töölauale

[UUDISED](#) [TEENUSED](#) [ABI](#) [LINGIKOGU](#) [KONTAKTID](#)

digital twin



- + “a digital replica of a living or non-living physical entity”
- + Digital mirror of the physical world
- + Information = data + context
- + Visualization helps to improve readability - adds context

proof of concept

- + Proof-of-concept solution showing small part of Tallinn
- + ~240 buildings in LOD2
- + Connecting data from 8 different sources
 - + Vector maps
 - + Point clouds
 - + 3D models (BIM)
 - + Mesh models
 - + Metadata
- + <http://3dkaksik.ehitus.ee/>



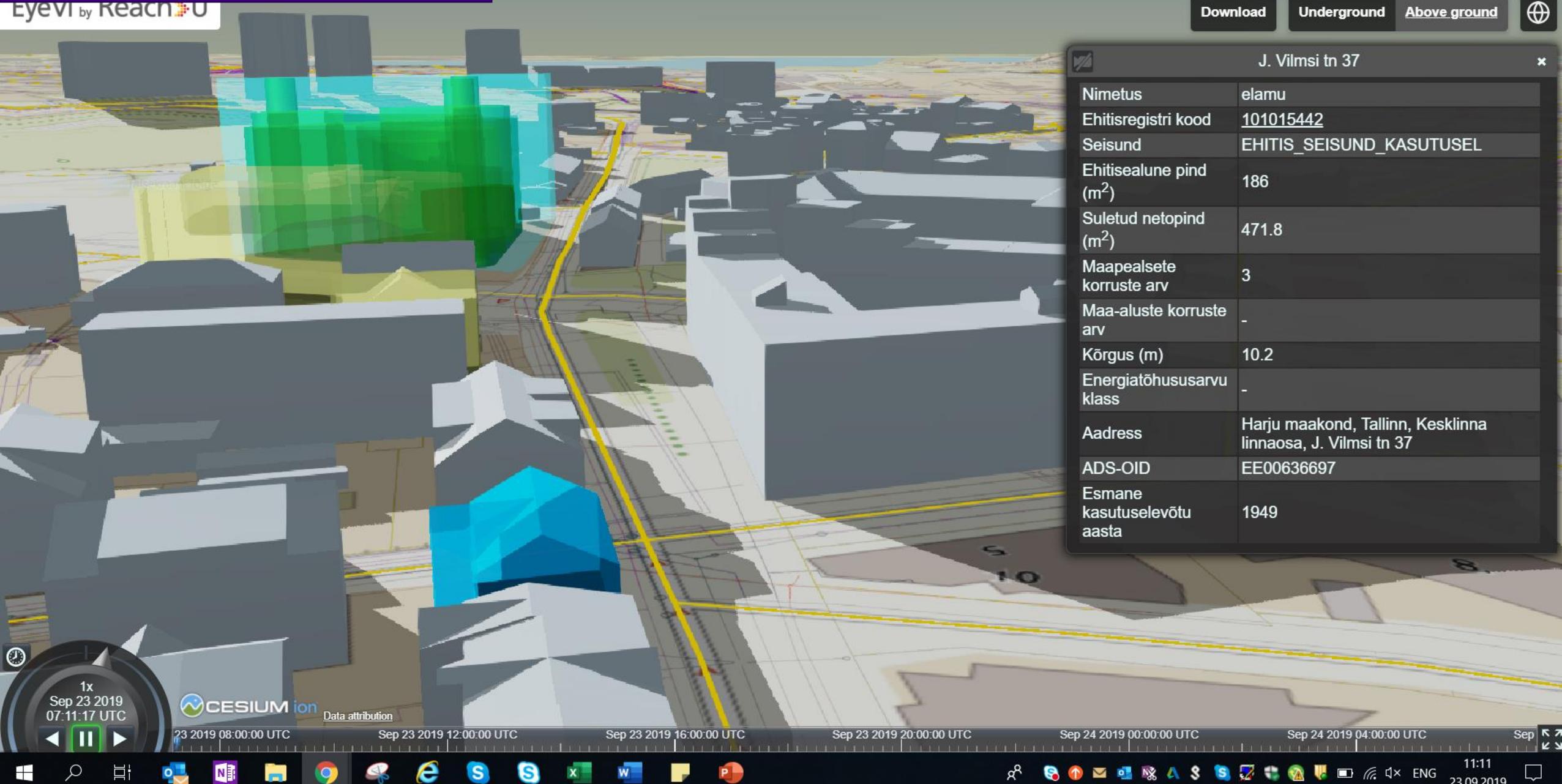
<https://www.youtube.com/watch?v=ZO5K2iXRyps>

[Download](#)

Underground

Above ground





A 3D city model visualization showing building footprints in various colors (green, blue, grey) and a yellow path or boundary line. A callout box displays detailed information about a specific building:

J. Vilmsi tn 37	
Nimetus	elamu
Ehitisregistri kood	101015442
Seisund	EHITIS_SEISUND_KASUTUSEL
Ehitisealune pind (m ²)	186
Suletud netopind (m ²)	471.8
Maapealsete korruste arv	3
Maa-alustekorruste arv	-
Kõrgus (m)	10.2
Energiatõhususarvu klass	-
Aadress	Harju maakond, Tallinn, Kesklinna linnaosa, J. Vilmsi tn 37
ADS-OID	EE00636697
Esmane kasutuselevõtu aasta	1949

Bottom navigation controls include a compass rose, a timestamp (Sep 23 2019 07:11:17 UTC), and a timeline from Sep 23 2019 08:00:00 UTC to Sep 24 2019 04:00:00 UTC.



The image shows a 3D visualization of underground utility infrastructure. A central vertical blue pipe is surrounded by several horizontal and vertical pipes of different colors: red, green, yellow, cyan, purple, and orange. These pipes are connected to various red cylindrical objects, likely valves or junction boxes. The background features a grey urban environment with white buildings and a road labeled "R. jaeklinna". A green rectangular area highlights a specific section of the network. A legend on the right side lists "Base layers" (Land Board map, Land Board photo, GeoDataHub map) and "Utilities" (Communication, Drains, Street lights, Water, Sewers, Low voltage cables, Medium voltage cables, Gas, Unknown objects), with most items checked.

Base layers

- Land Board map
- Land Board photo
- GeoDataHub map

Utilities

- Communication
- Drains
- Street lights
- Water
- Sewers
- Low voltage cables
- Medium voltage cables
- Gas
- Unknown objects

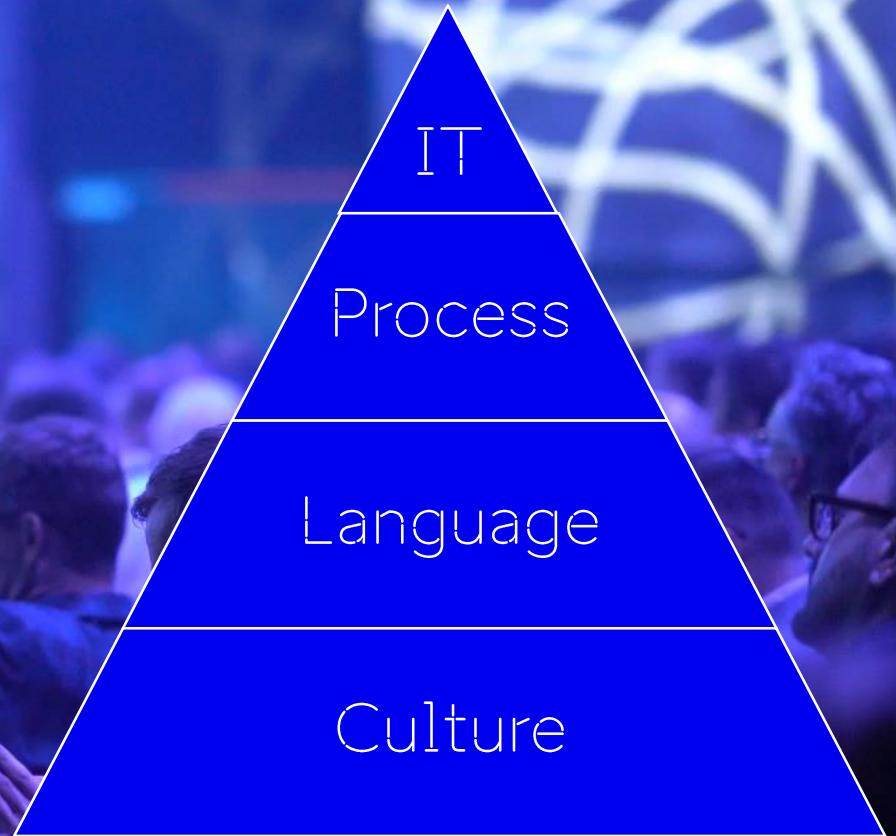
1x
Sep 23 2019 07:11:17 UTC
CESIUM ion Data attribution
Sep 23 2019 08:00:00 UTC Sep 23 2019 12:00:00 UTC Sep 23 2019 16:00:00 UTC Sep 23 2019 20:00:00 UTC Sep 24 2019 00:00:00 UTC Sep 24 2019 04:00:00 UTC Sep 24 2019 08:00:00 UTC

11:13
23.09.2019

collaboration

between **public** and **private**

- + Public procurers as the model client
- + National **digital infrastructure for construction**
- + Active participation and support from private sector, open sharing of knowledge
- + international co-operation



collaboration partners

- + Estonian Public Clients BIM Group (Buildings and Infrastructure)
- + Municipalities (e.g. Tallinn)
- + Government agencies and ministries
- + **Digital Construction Cluster**
- + Industry associations
- + Universities and schools
- + **EU BIM Task Group**
- + Nordic and Baltic public authorities



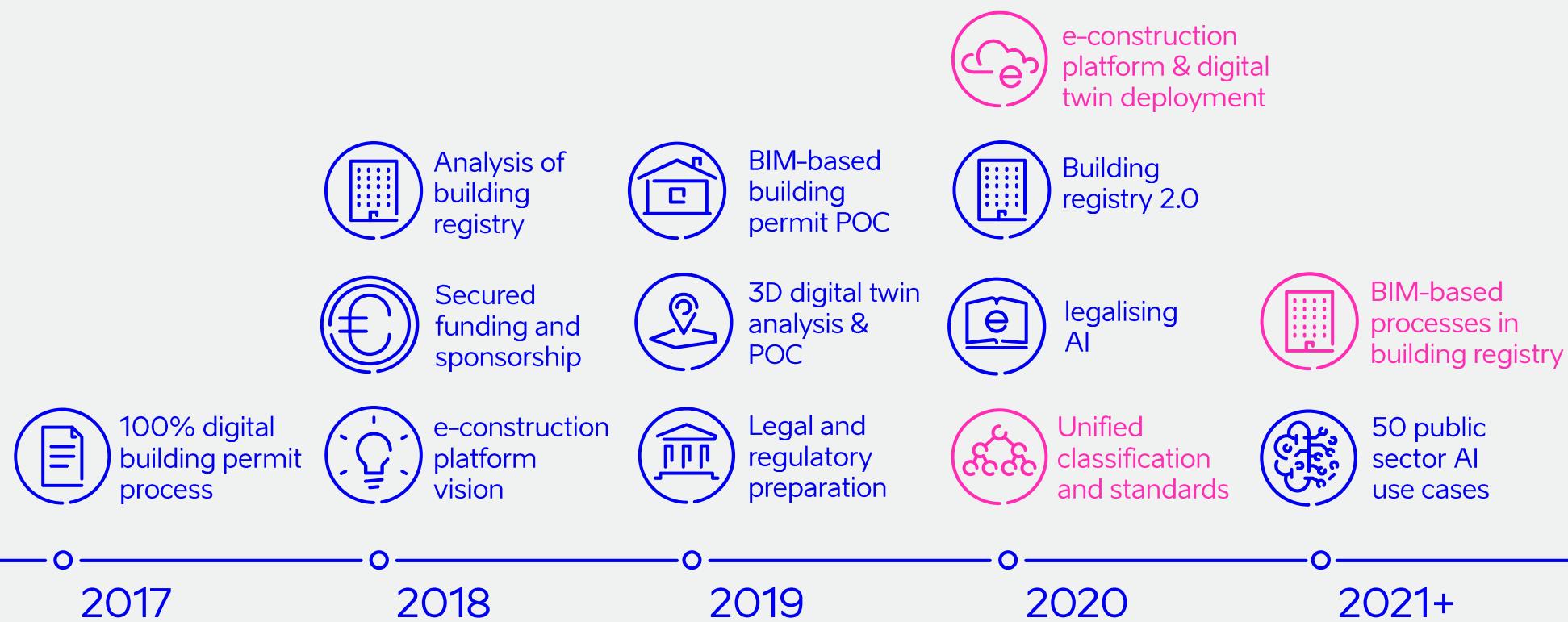
agility

start-up mentality
in government

- + over 600 startups in Estonia
- + 4 unicorns - #1 in start-up friendliness
- + deliver incrementally
- + fail fast and improve
- + build to scale-up



e-construction roadmap



digital leadership

The strongest leadership brings enlightenment.

- + Technology or money is not the solution

join 33,000+
e-residents



Thank you!

- + Collaboration and transparency is key
- + Public infrastructure for connecting data and services
- + Use International open standards
- + Be bold and agile

jaan.saar@mkm.ee
+372 5290777