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

+ digital signature saves 5 days a year
+ 99% state services are online
+ #1 ITU global cybersecurity index (Europe)
+ #1 BARCLAYS 2016 digital development index
+ ‘the most advanced digital society in the world’ — WIRED Magazine

300 meters

A stack of paper saved each month
exchange


+ saving 1407 years annually
+ 651 institutions and enterprises
+ 504 public sector institutions
+ 2691 different services
+ over 900 million transactions per year
+ exported to Finland, Kyrgyzstan, Namibia, Faroe Islands, Iceland, Ukraine, and other countries
ease of doing business

Simplest and fastest business environment.

+ a few hours to start a company
+ hassle-free e-taxation
+ full automatization in tax reporting by 2020
+ e-Residency — Estonian e-services to every world citizen
+ 100% digital building permit process
what is the problem?

<table>
<thead>
<tr>
<th>Industry</th>
<th>Compound annual growth rate, 1947–2010 (%)</th>
<th>Total change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>4.5</td>
<td>16.1x</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>3.5</td>
<td>8.6x</td>
</tr>
<tr>
<td>Wholesale and retail</td>
<td>3.4</td>
<td>8.0x</td>
</tr>
<tr>
<td>Overall economy</td>
<td>1.9</td>
<td>3.3x</td>
</tr>
<tr>
<td>Mining</td>
<td>0.5</td>
<td>1.4x</td>
</tr>
<tr>
<td>Construction</td>
<td>0.1</td>
<td>1.1x</td>
</tr>
</tbody>
</table>
objective:
increase productivity $x^3$

+ Government aims to increase construction sector productivity $x^3$ by 2030
+ Current productivity is below EU average
how **gov** influences sector?

**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 vision

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

- built on top of existing e-gov infrastructure
- open platform and API-s
- secure by design with e-ID authentication
- KSI blockchain used for integrity verification of government registries
- built for automation and AI
- access point to **digital twin**
what is a 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
3D digital twin

Phase I, Nov 2018 – March 2019

+ Visualize built environment data from different public and private sources, integrate GIS and BIM
+ Integral part of e-construction platform
+ Define use cases and benefit
+ Technical solution analysis, cost estimates, scalability
+ Joint project with other ministries and public institutions
+ Practical applications for planning
+ Proof-of-Concept:
best of breed

+ We looked at the following examples:
  + Berlin
  + Singapore
  + Helsinki
  + New York
  + Hamburg
  + Toronto
  + Rotterdam

+ Standard technologies:
  + CityGML
  + CesiumJS and 3D Tiles
  + 3D City Database
use cases

+ 88 use cases were mapped during workshops and interviews

+ Main scope use cases focused on
  + planning (e.g. zoning restrictions, simulations)
  + design (e.g. input data for design)
  + construction (e.g. site planning and logistics)

+ Additional use cases and applications in various fields (e.g. rescue services, forestry, risk mitigation etc.)
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.eehitus.ee/

https://www.youtube.com/watch?v=ZO5K2iXRyps
<table>
<thead>
<tr>
<th>Nimetus</th>
<th>Alaaja nr 4</th>
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<tr>
<td>Ehitisregistri kood</td>
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<td>Seisund</td>
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<td>Maa-aluste korruste arv</td>
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<td>Kõrgus (m)</td>
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<td>Energiaühusarvu klass</td>
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<td>Aadress</td>
<td>Harju maakond, Tallinn, Keskilinna linnaosa, J. Vilmsi tn 57</td>
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<td>ADS-OID</td>
<td>EE01866939</td>
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<tr>
<td>Esmane kasutuselevõtu aasta</td>
<td>1980</td>
</tr>
</tbody>
</table>
Detalplaneering DPO24630

Adressa: Gonsiori tn 40, J. Viimsi tn 51
Aegamisaegselt tegutseb: Nordecon AS
Seisund: DP kehtestatud (12.02.2016)
Videi planeeringis: https://pr talkview.ee/Detail/Planning/Details/DPO24630
Kroosku lühiseks kohale: see ei ole kohalik
Kroosku pindala (m²): 33188
Kroosku lühiseks kohale: arvma +0/0 relative 0 ± 50
Hoone suurim lubatud arv kroosku: 1
Hoone suurim lubatud ehitisala pindala: 2470 m² (maha peak), sh 5,10
Kroosku osa 2140 m²
Hoone suurim lubatud ehitisala pindala: 2400 m² (maha all)
Hoone suurim lubatud kõrgeus maapinnast: 39 m (10 maha peak)
Kroosku osa
Lubahõravus arv 100
Suurendatud kroosku: 108
Normatiseeritud parkimiskohtade arv 180
Kroosku parkimiskohtade arv 181

Tulehutusnõuded

Tule leviku lõikamiseks on hoonestusala määratud naaberhoone meetri kaugusel kui 8 meetrit.

Vaatetunnistus mõjutamine

Planeeritud kroosku hoone ei hakka varjama vaatamist vanalinna, kuna maapinnas langeb oluliselt maapinnale kaugusena suunad.

Insolutsiooni tingimustest muutumine

Usalduse projekteerimisel tuleb tagada olemasolevate olamine korralikki insolutsiooni stabiilne vähemalt 3 ümamalt oluluses, kuna juures insolutsiooni vihorehovust ei tuli veenduda ümamalt oluliselt korralikust.
e-construction general roadmap

- Analysis of building registry
- BIM-based building permit POC
- Building registry 2.0
- Secured funding and sponsorship
- 3D digital twin analysis & POC
- Legal and regulatory preparation
- Legalising AI
- Unified classification and standards
- BIM-based processes in building registry
- 100% digital building permit process
- e-construction platform vision
- 50 public sector AI use cases

2017  2018  2019  2020  2021+
what next?

Development of a modular visualization component and database for 3D data

+ 3D base data set
+ 2 new services for planning and design
+ Agile development and implementation with short feedback loops
join 33,000+ e-residents
Thank you

+ Collaboration and transparency is key
+ Use open and international standards
+ Shared platforms make you faster
+ Be boldest

jaan.saar@mkm.ee
+372 529 0777