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E-Estonia

Blueprint for a
Digital Nation

E-Estonia: The Ultimate Digital Democracy

Estonia has become a worldwide phenomenon, renowned for how they have mastered technology to entirely digitize their public service, achieving the ultimate **Digital Government** goal of **ending bureaucracy** and building an end to end digital nation.

A Digital Republic of the Future

Across the world other countries have commented enviously on their success – The New Yorker wrote **this excellent, detailed analysis**, describing them as the *Digital Republic of the future*.

“E-Estonia is the most ambitious project in technological statecraft today, for it includes all members of the government, and alters citizens’ daily lives. The normal services that government is involved with—legislation, voting, education, justice, health care, banking, taxes, policing, and so on—have been digitally linked across one platform, wiring up the nation.”

France24 ran **a special feature**, and their voting platform is considered **a potential solution** to the democratic challenges many nations face today.

Their digital transformation isn’t limited only to the delivery of online government services, it extends entirely across their society and economy yielding multiple levels of benefit, from Education through business.

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They are now [outperforming other European nations](#) for education and their E-Residency program, a flagship example of how technology underpins new economic growth capabilities, has exemplified their openness to other countries [generating € millions](#) in direct income.

[Another video](#) shares a short case study of E-Estonia from Freethink, interviewing Toomas Hendrik Ilves, President of Estonia from 2006 – 2016, telling the compelling story of the global success of Estonia as a digital nation leader, boasting the most advanced digital government in the world.

Ilves recalls how Estonia faced massive economic challenges upon achieving the restoration of independence in 1991, a time that soon saw the emergence of the Internet.

Toomas realized the opportunity was that Estonia was no further behind than any other country in this field, and so began pioneering their adoption, with all schools being online by 1998 and the framework for E-Estonia in place by the early 2000's.

Fast forward to today and Estonia now enjoys an entirely digital society – Via a single digital identity everything except weddings and real estate can be transacted online, including voting. Not only is it a convenience but it's also the foundation for a prosperous and healthy society. Being entirely digital has meant Estonia has continued uninterrupted during Covid-19.

A keynote theme is that size and money isn't the essential ingredient for success.

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Toomas now lives in the heart of Silicon Valley in the USA, and despite their vast wealth and being surrounded by the behemoth tech giants like Apple, Google and Facebook, American digital government is surprisingly poor. Processes are still paper-based, requiring photocopies be taken to government offices, whereas Estonians can file taxes in only six clicks in two or three minutes.

In an age of 'diplomacy via Twitter', of fake news and a large scale collapse in the trust citizens have in their governments, Estonia offers an exemplar that begins with hyper-efficient Digital Government and extends far beyond that into a profound blueprint for transforming the very nature of democracy itself.

The Ultimate Digital Democracy

Most importantly and powerfully Estonia has transformed the relationship between the state and the citizen, as eloquently described by Geoffroy Berson in his [Medium blog](#), where he explores the dynamics of privacy and trust, and how Estonia in contrast to many others has succeeded in utilizing technology to build a stronger sense of mutual accountability, a new social contract.

E-Estonia X-Road: Middleware Platform for a Digital Nation

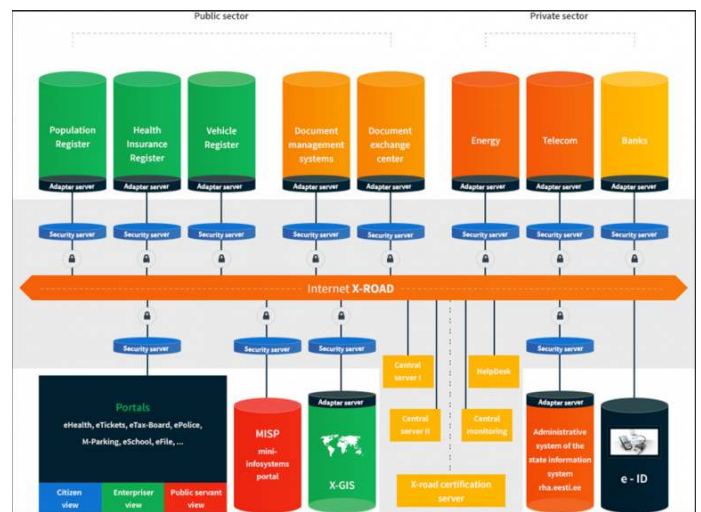
As the World Economic Forum defines a central component part of 'Digital Public Infrastructure' is a National Data Sharing Platform.

A world leading pioneer of this capabilities is Estonia, where the backbone central to success as a digital nation is their 'X-Road' system.

As [this presentation](#) describes, it is a central component feature that enabled their journey to become a world leading digital state.

The Nordic Institute for Interoperability Solutions (NIIS) is a non-profit association founded jointly by Finland and Estonia, and is responsible for the development and management of the X-Road core.

This diagram highlights how it acts as a [single information sharing platform](#) for inter-connecting all government systems and some commercial ones where appropriate.



X-Road is an open source data exchange layer solution that enables organizations to exchange information over the Internet. X-Road is a centrally managed distributed data exchange layer between information systems that provides a standardized and secure way to produce and consume services, and is released under the MIT open source license and is available free of charge for any individual or organization.

E-Estonia X-Road: Middleware Platform for a Digital Nation

X-Road ensures confidentiality, integrity and interoperability between data exchange parties. X-Road is used nationwide in the Estonian data exchange layer X-tee and in the Suomi.fi Data Exchange Layer service in Finland. However, X-Road is not just for public sector organisations – all kinds of organisations regardless of size or type can join the national environments and exchange data with other member organisations.

Two X-Road ecosystems can be joined together, federated. Members of the federated ecosystems can publish and consume services with each other as if they were members of the same ecosystem. Federation enables easy and secure cross-border data exchange between member states using X-Road.

Helpful implementation guides include:

- **Introductory overviews:** [Youtube video](#), [Overview presentation](#), [EU overview presentation](#).
- **Best Practices:** [E-Government in Estonia – Best practices](#), [Overview of legislation and governance context](#), [Nationwide E-Estonia mindset](#).
- **Use cases:** [How it enables Personalized Healthcare](#).
- **Technical implementation:** [Discussion of REST / JSON X implementation of X-Road](#), [Academic paper on pseudonymization](#), [Examples of e-government integrations](#), [Training for developers of X-Road interfaces](#).

[This video](#) shares a talk given by Petteri Kivimäki from NIIS at the 2019 Platform Summit in Stockholm, and [this video](#) shares an interview with Estonian CIO Siim Sikkut describing how the platform approach is fundamental to this capability.

E-Estonia X-Road: Middleware Platform for a Digital Nation

Featured Vendor: Cybernetica UXP

Expertise from building E-Estonia has been commercialized, led by vendors such as Cybernetica, who offer a repeatable X-Road solution capability, their 'UXP' – [Unified eXchange Platform](#).

UXP brings together data from organisations, information systems, and databases. It provides crucial components for interoperability and data exchange in a secure and standardised way. UXP allows service providers to retain control over their systems and data, yet making them a member of an infinitely scalable and decentralised data exchange network.

The Government of Greenland set out to modernise public services by creating a secure data exchange platform – Pitu – a crucial step in its digital transformation. Cybernetica, as the prime contractor, [deployed its UXP for them](#), enabling seamless and secure data sharing across key government systems.