



CASE STUDY

The world's first data embassy – Estonia

Through its e-Estonia initiative,⁸² Estonia has built a digital society and developed the most technologically advanced government in the world. Practically every government service is paperless and performed electronically. As a result, Estonia is highly dependent on its information systems and the data stored on them. To protect its data, Estonia developed the concept of data embassies – servers outside the country that are legally under Estonian jurisdiction. The digital copies of key databases they store can be accessed in the event of a major data incident in the country, thereby protecting the digital lifeblood of this small Nordic country. Estonia is on its way to becoming a “country without borders” (MoEAC, 2016), and the data embassy is one of several Estonian programmes that blurs the lines of national borders and sovereign identity in a digital world.

82. See <https://e-estonia.com>.

THE PROBLEM

As part of its digitisation process, Estonia has actively implemented a “paperless governance” policy. This has resulted in a situation in which essential databases (e.g. land, population and business registries) exist only in digital form. While the benefits of a paperless government are immense, it does raise a few challenges. One is the issue of how to secure data that could become vulnerable in the event of a major natural disaster or cyber, terrorist or military attack. Such an attack is not purely theoretical; Estonia has faced a number of cyber-attacks in recent years. In 2007, Russian attackers took 58 Estonian websites offline, including those of the government, most newspapers and many banks.⁸³

AN INNOVATIVE SOLUTION

This initial attack demonstrated the need for an outside-the-country solution, which was subsequently discussed for several years by cyber-security experts, academics and state IT professionals. To address the problem, Estonia launched the world’s first data embassy in partnership

83. See <https://e-estonia.com/estonia-to-open-the-worlds-first-data-embassy-in-luxembourg>.

with the Government of Luxembourg. In June 2017, the Prime Minister of Estonia and the Prime Minister of Luxembourg signed a unique bilateral agreement between the two governments regarding Estonian data and related systems (see Figure 24), which are stored in Luxembourg’s government-owned data centre. This agreement creates the basis for establishing the world’s first data embassy. The data embassy is an extension of the Estonian government cloud, meaning that the Estonian state owns server resources outside its borders. These will be used not only for data backup, but also for operating critical services. As with physical Estonian embassies, the servers are considered sovereign embassies in foreign data centres.

“One of the most important tasks of any country is to ensure continuity both on a state level as well as in terms of public services. The Estonian digital and information society is already so highly sophisticated that it is no longer possible to move back to a paper era. Therefore, we have to do our utmost to ensure cyber security, including maintaining digital continuity.”
Siim Sikkut, Government Chief Information Officer Estonia



Figure 24: Signing ceremony between Estonia and Luxembourg Source: Government of Estonia.

Trend 1: Identity

While opening the first data embassy involves placing Estonian systems and data in another sovereign county, it creates an additional security guarantee for Estonian sovereignty. Estonia will back up critical data and services important for the functioning of the state outside the physical territory of Estonia, while Luxembourg guarantees that the data and the servers are protected by the same legal guarantees as the data and servers in Estonia. This approach will help ensure the country's digital continuity – its capability to maintain services and digital data regardless of interruptions.

The data embassy benefits Estonian citizens, who will be the recipients of a more reliable and secure digital society. Additionally, it creates an extra security guarantee for 30 000 and more e-residents of Estonia, as discussed previously, who expect Estonian digital services to be available at any time independent of location.

After the first data centre in Luxembourg is fully implemented and lessons are learned, Estonia is likely to open additional data embassies in other countries.⁸⁴ Data embassy leaders believe that the concept should be considered by every government as countries become more and more technologically advanced. A number of countries have already contacted Estonia and are planning to establish a network of data embassies abroad.

NOVELTY

The data embassy is the first of its kind. It introduces an innovative new paradigm in a digital world whereby a country distributes its critical data and information systems in co-operation with other countries to ensure its continuity and security. This innovation also represents the first bilateral agreement to expand the Vienna Convention on Diplomatic Relations, which provides the framework for international diplomatic relations, to the hosting of data and information systems. As such, Estonian officials describe it as a unique case study in international law and relations. It may also support a new concept of the free movement of data, in addition to people, across the European Union.

The data embassy is also innovative in terms of technical design and implementation. Novel thinking is required to design a system that keeps the data of the two sites

in sync, while preventing data loss. To achieve this, new technological solutions will be developed including, for example, the use of blockchain technology to ensure data integrity.

RESULTS AND IMPACT

The data embassy is still very new and not yet fully developed and implemented. Much of the initial impact has been intellectual and political, with innovative conceptions of cross-border storage and use of data spearheading a new phase in international law. Over time, the world's first data embassy will validate the importance of ensuring digital continuity of the state and the possibilities of building distributed systems with the assistance of technologies such as blockchain to help increase a country's security.

CHALLENGES AND LESSONS LEARNED

The data embassy project encountered legal challenges which primarily revolved around guaranteeing the confidentiality and security of critical data lying within the jurisdiction of another state. To overcome these challenges, the governments of Estonia and Luxembourg signed a bilateral agreement that established immunity for the data embassy. This agreement is the first of its kind. The project has also encountered technical challenges (e.g. how to protect the integrity and confidentiality of critical data outside Estonia, how to redesign information systems to work reliably in globally dispersed environments, etc.), which require new technological solutions. These solutions and the tools to overcome the outlined challenges are currently under development.

One of the key lessons learned according to Estonian officials is the importance of finding partners who think similarly and are eager to innovate, and with whom mutual trust exists or can be cultivated. Luxembourg is a good partner for Estonia as the government understands the importance of digital continuity and is ready and willing to make efforts to secure this future. The project was made possible by Luxembourg's support for the project and readiness to host the world's first data embassy within their government-owned data centre, thereby providing legal immunity for the data and server hosting.

⁸⁴. See <https://e-estonia.com/estonia-to-open-the-worlds-first-data-embassy-in-luxembourg>.