REPORT 2022

The future of the data society

Scenarios up to 2035

Summary

FORESIGHT CENTRE

An independent think tank at the Riigikogu

The data society 2035, summary of the lines of research

The spread of digital technology into every area of life has caused the datafication of the economy and society, as the actions of people, companies, machines and even nature leave a lasting data footprint. The datafication of everyday life increased noticeably as a consequence of the Covid-19 pandemic, as virtual school and work were added to online social communication and shopping. The next leap forward in data in everyday life will come as a wide range of domestic appliances are connected to the internet, which will happen together with the spread of data networks using 5G technology. New data are being added to the existing stockpiles at an ever increasing rate, as the volume of additional data created each year will double over the next three years[1].

Further developments in data will be shaped by various trends in development and possible turning points:

- **Data are an increasingly large source of value added, but a major part of the data that are most valuable for users are owned by large technology companies.** The European Union is applying new regulations that will force companies with significant market power to make the data they have collected on small and medium-sized enterprises and on individual people available to the subjects of those data. How successful this proves will depend largely on how ready people are to play an active role in managing their own data.

- **The environmental footprint of data is increasing rapidly.** The cloud services used to store data now produce a larger share of global carbon emissions at 2.5%-3.7% than does air travel at around 2.4%. Some forecasts predict that data-processing will account for around 21% of global energy consumption in 2030[2]. Countries face the dilemma of whether and how to promote both a data-based economy and environmental protection at the same time.

- **Increasing geopolitical confrontations are making it harder to agree on international standards.** The European Union and the USA are moving steadily closer to one another on questions of data exchange and minimum levels of data protection, and this has been driven further by the war in Ukraine, which has deepened transatlantic cooperation and shown the need for a joint front against imperialist autocrats. On top of this there is the confrontation with China and its increasing sphere of influence. This is making it harder to move successfully towards global harmonisation of standards affecting the use of data, such as data standards and machine-readable public data.

- **People skilled with data are shaping society in their own image.** Skill with data means being able to use data for serious work or to earn income, and the data literacy needed to operate securely day-to-day in a datafied world. Poor data literacy is a cause of the digital divide. Data do not only reflect reality but also create it[3], reinforcing power relations or setting up entirely new social phenomena that have unclear long-term consequences, such as the role that data-based recommendations play in our lives.

1 Statista (2022). Volume of data/information created, captured, copied, and consumed worldwide from 2010 to 2025, https://www.statista.com/statistics/871513/worldwide-data-created/
2 Õunapuu T., Raun, M., Oleks, M., Tatar, M., Kaldur, K., Tiits, M. (2022). Data in the Future Society (in Estonian, summary in English), cited in: Garcia, C. (2022). The Real Amount of Energy A Data Center Uses, https://www.akcp.com/blog/the-real-amount-of-energy-a-data-center-use/
3 Masso et al., (2020). Kuidas mõista andmestunud maailma? (Understanding the Datafied World) Tallinn: Tallinna Ülikooli Kirjastus.

- **The European Union is searching for a balance between data protection and economic development.** The European Union is currently working on legal acts concerning data (the Big Five), which are intended to increase the rights of European Union residents in decisions about their data without restricting economic growth. For data subjects to be able to check the data held on them, access is needed to those data so that people and companies can share them. It is not yet known how many people are able and ready to take decisions about sharing their data to the extent that they can be called data literate, as such decisions can sometimes involve very thorny issues. Furthermore, although the developments in European Union law are mainly aimed at facilitating the controlled use of data, they will increase the role of discretion and interpretation by official institutions in the release of data. A large part of the General Data Protection Regulation (GDPR) for example has been left for the courts and the supervisors to clarify. Processing complaints and court cases takes time though, and could mean there is a lack of legal clarity for a long period, which would restrain the use of data.

Scenarios were mapped out to examine possible developments in the future. Two key unknowns that will steer the future course of the data society are **the division of control over data**, and **whether private interests or public interests dominate** in the future development of the data society. Combining the different possible outcomes of these two unknowns creates four scenarios for the future of the data society.

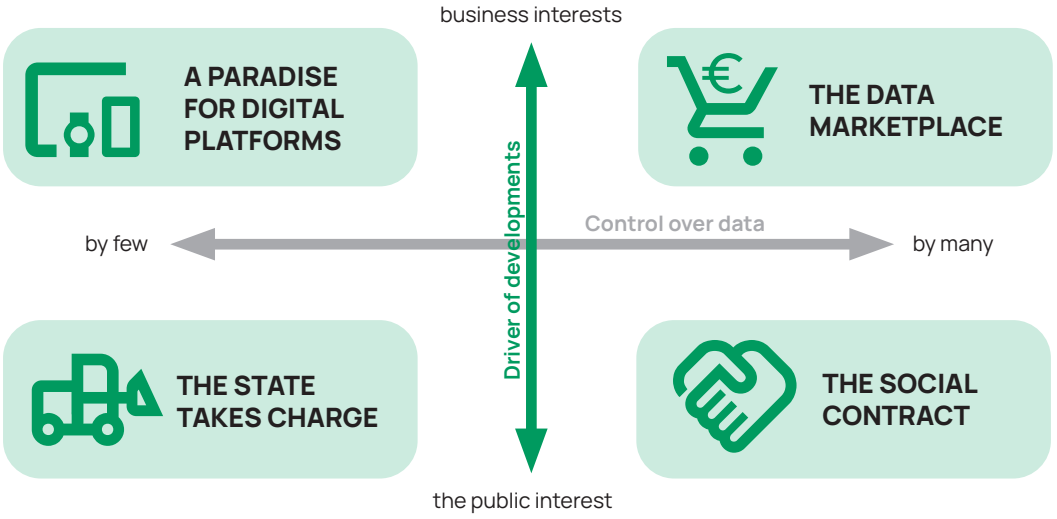

Figure 1. Four future scenarios for the data society
Source: Foresight Centre 2022

A paradise for digital platforms

Despite the regulatory efforts of the European Union, global digital platforms gain in importance as service providers, as they are in the front line for developing new data technology such as artificial intelligence, machine translation and so on. This means they can start providing many services better than states can, such as further education or data-based healthcare services. The convenience and ease of use of the services means that people voluntarily hand over control of their data, and regulation is not able to do anything to change this. They find managing their own data difficult, and so only a small number of people are willing and able to do that. Digital platforms expand the services into areas that have traditionally been the preserve of governments, such as further education and data-based healthcare services. As the capacity for development of the digital platforms is greater than that of governments, and their services are easier to use, they start to provide several services instead of governments or working together with them. This works out cheaper for states overall while raising questions on retaining critical services at all times. The trend is encouraged by the global environment, as the threats from Russia and China push the USA and the EU to stick closer together, and so the giant US data platforms are no longer seen as competitors in Europe, but rather as allies.

The data marketplace

European Union regulations have started to hamper the development of the data economy quite seriously and are making Europe less competitive than the rest of the world. It is considered that expanding opportunities for using data to private companies is a strategic option for growth that needs to be seized after the European economy has been hit by several crises, and that a strong local counterweight to the large foreign digital platforms needs to be created. The European Union's data protection regulations are loosened, except those that curb the influence of the large digital platforms and make them share data with small companies, in order to encourage innovation and startup businesses. Data relations are built on the principle of the marketplace, where people are able to decide about their own data and sell and exchange them, and earn income from them. Specialised environments like data exchanges and data intermediation services are set up for this and are operated by the private sector. Businesses can buy people's data for money and can trade them on the data exchanges as well as using them for their own commercial purposes.

The social contract

The efforts of the European Union are bearing fruit, as people and companies control their own data, and there is fierce competition in the data market. Technological and legal developments have created the tools and intermediation services that people can use to manage, share and sell their own data. It is difficult for people to manage their own data actively, and not everybody has the desire, time or skills to do so, and so individuals come together in data trusts to exercise their data rights. The trusts represent their individual members and negotiate the best conditions on their behalf for the use of the data of the members. Each member of the trust has the right to vote. The trusts do not necessarily sell the data for money, though some trusts may specialise in doing so, but rather they direct them to projects that benefit the members of the trust or society as a whole, such as better education or healthcare.

The state takes charge

The failure to reduce the power of the global digital platforms through European Union law, and concerns about privacy following various data leaks and data misuse scandals, have led states to take over the decision-making about the use of data. They are encouraged in this by people coming to understand how complicated and time-consuming it is to manage their own data actively. Transferring decision-making about the use of data to the state makes people grateful that they do not have to think too much about their data as they are securely under the control of the state. They hope to receive in exchange a lot of convenient and personalised public services, and data-based policy-making.

The scenarios highlight several serious problems, and now is the right time to think about how to resolve them. A very topical question for example is how to ensure that a data society led by large companies will act in the interests of individuals and society as a whole. There are some options for this:

- basic data literacy needs to be improved, together with people's understanding of how digital platforms use their data;
- a parallel data ecosystem could be developed to counteract the data power of the large digital platforms, and it could centre on open data, open-source software, and data altruism for the benefit of public services, education and science;
- the income of companies operating internationally could be taxed at the place where the turnover is generated, so that the data economy would bring greater revenues to state treasuries, though this requires international agreement.

Equally important is the question of how to encourage data-based innovation that is ethical and remains within the limits of data protection. The scenarios highlighted the following options:

- public awareness of the rights around data sharing and the benefits of it could be raised in order to encourage people to share their data;
- cooperative data ownership could be regulated so that the data subjects are shareholders with the right to vote, as this would give companies access to large amounts of data on cooperative shareholders while allowing the shareholders to control the use of their data and the benefit gained from it;
- participants in the data market could be given a secure environment for data exchange with a framework for consent and centralised consent services so that SMEs do not need to develop their own resources to the same extent;
- tax benefits could be granted to individuals or data associations that are active in sharing their data with businesses and the state.

The different possible tracks of future development suggest not only steps that it would be reasonable to take in any case, but also major dilemmas for governments. There are at least five points where critical decisions need to be taken:

- **Should a self-sufficient public sector be built, or a capable private sector?** It is necessary to consider how much the state should aim for maximum independence and self-sufficiency in providing data-based services in the public sector, which would mean increasing the state apparatus and attracting skilled people from the private sector, and how much it should focus on increasing the capacity of the private sector and creating a functioning data market so that the state could be slimmer.

- **Alone or with Europe?** Estonia faces the question of whether to focus firstly on effective application of European initiatives or on creating its own dedicated data society solutions within the European legal framework.

- **Localised decision-making or centralised management?** Strong central coordination of data policy will provide firm support for data-based state management and for the accessibility, quality and interoperability of data. The local authorities in Estonia are a long way behind the central government in their management and use of data. This raises the question of the role that the central government should have in developing the digital and data policies of local governments and IT infrastructure.

- **What is the role of tax policy?** Tax policy and tax breaks allow the government to steer the data economy more flexibly in different scenarios, by affecting how individuals behave, including their readiness to share their data, and how companies behave, including their readiness to take risks and to give something back to society. The key question in this is how willing Estonia is to try out how different tax models will affect the data society and the data economy.

- **How much faith should be put in the capacity of people to manage their own data?** New legal initiatives and technological solutions such as the consent service will give people decision-making rights over their own data. Exercising such rights assumes that everybody has sufficient data literacy to avoid making potentially harmful choices. This poses the question of whether support systems are needed to improve people's data literacy and protect them from possible risks, and what should those systems be, for example regulated data trusts, the development of training programmes, or further education courses.

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