Research Brief

Rathenau Instituut

The need for database design supervision

The use of large scale databases in the areas of e-health, youth care, electronic transport cards and internet customer profiles, is not free of risks, shows a new report by the Rathenau Instituut. To reduce these risks there is an urgent need for the independent supervision of the design and use of databases. The study also stresses the importance of empowering citizens, consumers and patients in their legal rights to access and correct errors in digital files.

Databases are the digital backbone of our information-based society. They offer us unprecedented possibilities for storing, processing and analysing data. They speed up communication, improve efficiency and, in general, make our life more convenient.

But the use of databases is rapidly turning the ICT promises into possible threats, shows *Databases – The promises of ICT, the hunger for information, and digital autonomy*, a recent report by the Rathenau Instituut.

Databases presents a fairly disturbing image of what can go wrong in the daily use of large scale databases. By examining six case studies, researchers from the institute found that data-related risks are widespread and linked to the design choices that were made when building the systems.

The study shows that other choices are possible; choices that guard the interests of citizens and consumers and incorporate sound thinking on the security, the legal position of citizens, and the necessity of collecting data.

The Rathenau Instituut promotes the formation of political and public opinion on science and technology. To this end, the institute studies the organization and development of science systems, publishes about social impact of new technologies, and organizes debates on issues and dilemmas in science and technology.

RECOMMENDATIONS

- **Supervision**
  There is an urgent need for the independent supervision of the design of large scale databases. There should be a clear idea of the security requirements, the legal position of citizens and consumers, and of the necessity of collecting data, before designing a database.

  This demands ICT knowledge of the technical possibilities and impossibilities, risks, and alternative design choices. In addition, the way large databases function in practice should be monitored continually to ensure their proper functioning.

- **Technical security**
  Technical security measures, rather than *procedural* security measures, should be used to reduce the risk of unauthorised data access, hacking, or data leaks. The security of ICT systems needs constant monitoring. Security measures that are adequate today, might be outdated tomorrow.

- **Legal rights**
  The legal position of citizens, consumers, or patients should be strengthened by creating possibilities for exercising their right to inspect and correct data. Citizens should be given as much control as possible regarding their own data.

- **Keep it simple**
  Policymakers should not be overambitious regarding the use and possibilities of databases. The goal a database must serve should be well-defined before designing it. Also, the data collection should be restricted to achieving that goal.

The Use of Databases – Lessons Learned

Does the Schengen Information System guard Europe against undesirable aliens? What do companies actually do with the details they collect on us? And how do we correct our digital file when something is wrong?

A report by the Rathenau Instituut reveals the risks related to the widespread use of databases, the problems citizens face in exercising their legal rights, and places doubts on the supposed effectiveness of large scale databases.

Security issues

The case studies show that the risks involved in the use of the database are not often adequately considered when designing it. The security of personal information continues to be an issue, especially with extra-sensitive data submitted in health or childcare systems.

The authors show how in the Netherlands, the national public transport chip card proved fairly simple to crack. This could easily have been prevented by choosing a different type of card.

The - procedural - security measures of the Dutch electronic patient record looked good on paper. But many questions were raised during its implementation phase, resulting in the Dutch Senate calling a halt to further development because of security and privacy concerns. Technical security measures rather than procedural measures could have improved security.

Digital dependency

Registration errors and mistakes in risk profiles are another issue. Through a coincidental data match, customers may incorrectly be profiled and thus be excluded from goods or services, such as an insurance policy. A weak legal position makes it difficult, if not impossible, for individuals to rectify errors. Statutory rights to inspect and correct personal data are often rights on paper only. So, the use of databases increases digital dependency rather than enhances autonomy.

Effectiveness?

The authors believe that the widespread optimism regarding the effectiveness of databases should be questioned. A case study on the Schengen Information System (SIS) shows that ambitions that are too high can work to their disadvantage. Because the SIS has to serve so many divergent policy goals, it is on the brink of a technical and organisational breakdown.

The rapid pace at which our society is being digitised entails an increasing need for well-considered database design. The Rathenau Instituut concludes this requires an overview of the risks associated with database use and alternative design choices. In order to test a sound decision-making, the design phase and use of large scale databases should be independently and continuously supervised.

SUMMARY

Databases – The promises of ICT, the hunger for information, and digital autonomy examines the possibilities and limitations of databases. It does so by comparing six case studies in the areas of e-health, youth care, electronic transport cards, municipal personal records, internet customer profiles and the European Schengen Information System.

- The study focuses on the complex dynamics between the design of a database, the purposes it must serve, and the risks involved in the use of it.

- The study demonstrates how risks are often overlooked. The security or reliability of - often personal - data is a problem. Incorrect data, mismatches or identity theft may lead to a virtual identity that does not fit reality. But citizens or consumers generally have a weak legal position to inspect and rectify errors.

- *Databases* warns against overambitious ICT plans. Simply collecting more data does not as a matter of course, lead to greater efficiency or more convenience. The report stresses that before designing a system, there should be a very clear idea of the goal it should serve, and of the data necessary to achieve that.

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