
Big data – ethical challenges for companies

Who we are, what we do and who we communicate with are all now routinely recorded by countless devices. This is not targeted monitoring but rather an inherent characteristic of digital technology. In addition, data are increasingly easy to store and evaluate using ever more complex procedures.

Some people view these developments as signifying tremendous potential for innovation, whilst others perceive a sword of Damocles hanging over privacy and personal freedom. Although both points of view are widely touted, the discussion of big data (and of the very term itself) remains in its infancy.

Big data can fundamentally be characterised by the four Vs:

«**Volume**»: a large quantity of data

«**Variety**»: a wide range of data types and sources

«**Velocity**»: the high speed at which data quantities are increasing

«**Veracity**»: the uncertainty regarding how reliable data are and what they say

To investigate this topic, experts at SATW have spent a year and a half examining big data at the interface between companies and their customers. These specialists have developed five current and potential future applications of big data and identified eight ethical standards and values that could be affected by big data. Their findings have been used to formulate recommendations for action for government and business that will aid in facilitating the development of big data technology and compliance with ethical frameworks.

Five applications of big data for companies

Prevent debt losses

Big data allows companies to validate their customers' credit ratings. Social scoring processes use a person's social media presence to extrapolate his or her payment habits. In doing so, complex algorithms also examine seemingly irrelevant data such as online surfing and search behaviour, technical information about the computer being used, or even the way in which an online form is completed. In addition to online shops, banks also increasingly use social scoring processes.

Improve risk management

Insurers can employ big data to calculate the risk of a claim or illness on an individual basis and adjust insurance premiums

correspondingly. Sensors in cars provide information about driving behaviour, and a customer's future state of health is evaluated via fitness trackers or even genetic analysis.

Tailor offer conditions

Airlines and online retailers vary their prices in real time. Big data applications extend a step further, allowing the ideal price for each customer to be individually calculated. Data such as gender, age, place of residence, job, income and personal preferences can be used to tailor prices and discount vouchers. It is conceivable, for example, that individual prices could be determined via facial recognition in over-the-counter trade, and this technique is already a reality in online trade in some areas.

Legal basis in Switzerland: the Federal Act on Data Protection

Swiss companies must adhere to the Federal Act on Data Protection (DSG) when handling big data. The DSG governs personal data processing. Personal data are deemed to include all data relating to an identified or easily identifiable person. The term 'processing' includes but is not restricted to the collection, storage, use, revision, disclosure, archiving or destruction of data. Article 4 of the DSG specifies the following principles for processing:

- The collection of personal data and in particular the purpose of its processing must be evident to the data subject
- Personal data may only be processed for the purpose indicated at the time of collection, that is evident from the circumstances, or that is provided for by law
- Personal data may only be processed lawfully; its processing must be carried out in good faith and must be proportionate

The principles for data minimisation and storage limitation are derived from these processing principles: as little data as possible must be collected, and the data storage period must be limited. Swiss companies that gather data on EU citizens or that operate across borders are also subject to the EU's General Data Protection Regulation.

Improve the efficiency of advertising campaigns

Big data could revolutionise the advertising industry: instead of costly, very broad campaigns, potential customers could be addressed in a targeted fashion. Relevant offers are inferred from purchasing and search behaviour in a process known as 'targeting'. In the future, 'emotional targeting' could even be used to determine a customer's current emotional state, and the results could then be applied for advertising purposes.

Create innovations and explore new sources of revenue

Big data applications aid companies with product development and innovation. For example, car manufacturers can incorporate usage data into the development of new models. Data can also serve as a source of revenue: apps and portable electronics produce large volumes of data that can be transferred to other companies or institutions. The commercialisation of data could potentially become more important than traditional core business.

Eight ethical standards and values for handling big data

The SATW experts identified eight ethical standards and values affected by big data. Often, consumers' requirements must be weighed against companies' equally justified requirements, and the impact of individual standards and values on practice is therefore unclear.

Protection of privacy

Protection of privacy is ensured by the principles of data minimisation and storage limitation. However, all the aforementioned big data applications bring this traditional form of data protection into question. Invasion of privacy is permitted only with the customer's informed consent.

Equality and non-discrimination

Elements such as customised prices pose a risk of discrimination. The customer's willingness to pay can be considered for pricing purposes provided that no accidental needs are exploited and no monopolies are created. A problem arises if customers do not know whether and based on what criteria they may experience discrimination.

Self-determination with regard to personal information

Everyone is entitled to self-determination regarding the collection, storage, use and transmission of their personal data. The use of such data requires explicit informed consent – in other words, consent that is granted once the details have been explained. One problematic area may be targeted emotional manipulation via advertising, which could make informed consent difficult.

Control of own identity

Control of your own digital identity is a specific element of the self-determination of personal information. Big data applications enable the consolidation of various customer characteristics into a digital identity. This process becomes ethically questionable if the customer is unaware of it and has no recourse for correcting any errors.

Transparency

Transparency is a requirement for informed consent. The terms and conditions of business represent one barrier to transparency, as they are often very extensive and difficult for non-experts to understand. In addition, companies are entitled to keep the algorithms they use to process data a secret. Transparency becomes even more complicated when self-learning algorithms are involved.

Solidarity

Solidarity primarily relates to insurance. Here, the principle that the party responsible is liable for the damages is often applied; a person can then claim solidarity if his or her emergency situation was not self-inflicted. However, insurers run the risk of attributing certain illnesses solely to specific forms of behaviour, thus disregarding genetic, social and environmental factors.

Contextual integrity

People divulge various pieces of data in different areas of life. If these data are no longer being used for their original purpose, then contextual integrity is lost – such as if information from friends is used to establish customised prices.

Ownership and copyright

Both the customer generating the raw data and the company that processes and utilises those data should be compensated for this activity from an ethical perspective. However, the extent to which data streams are covered by copyright has not yet been clarified.

Conclusion and recommendations for action

This study demonstrates that the ethical implications of big data reach beyond invasion of privacy. Big data is not inherently unethical – the impacts of its applications must be reviewed individually.

Responsible data handling is in the interest of companies; however, it is ultimately customers who supply the raw data and who make big data applications possible. If companies handle data in an unethical manner, they risk losing social acceptance of their activities (their ‘licence to operate’). Government and business must work together to make appropriate use of the opportunities afforded by big data. The authors of this study thus recommend the following actions:

For companies:

- Consider the ‘ethics case’ as well as the ‘business case’ and identify potential conflicts at an early stage
- Take customers’ needs into account: would customers continue to provide their data if they knew what was happening to it?
- Employ proactive, transparent and comprehensible communication regarding data acquisition and use

For government:

- Revise the Federal Act on Data Protection with regard to big data applications and their ethical challenges
- Cooperate with business to create industry codes and inspection bodies
- Standardise the terms and conditions for business with requirements for content, form and comprehensibility

SATW report on big data applications and ethics

This study, performed at HTW Chur on behalf of SATW, used literature analyses and expert workshops and interviews to explore the potential and challenges of big data applications. ‘Big data is an increasingly important topic for companies’, asserts project director Professor Christian Hauser of the Swiss Institute for Entrepreneurship (SIFE). ‘However, the legal framework comes from an era before big data applications were conceivable’, which enables companies to position themselves ethically. The study offers important food for thought, as summarised in this paper.

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