"Green" Big Data: Privacy preserving Big Data technologies COMPLEXITY SCIENCE HUB VIENNA VIENNA WIRTSCHAFTS WIRTVERSITÄT WIRTVIENTA UNIVERSITT OF ECONOMICS AND BUSINESS PRIVACY &

SUSTAINABLE COMPUTING LAB

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Scalable policy-aware linked data architecture for privacy, transparency and compliance



Horizon 2020 European Union funding for Research & Innovation

EXECUTIVE BRIEFING: SICHERHEIT IM WANDEL NOVEMBER 15, 2017. WU



"Then we should take care of Big Data forms of pollution"

Ethical violations Non-transparent

Privacy leaks

Unfair use of data

spurious correlations



Wil van der Aalst (TU Eindhoven) http://www.responsibledatascience.org

Green Big Data A multidisciplinary perspective...



Privacy & Sustainable Computing Lab

- Launched September 2016: launch event with various important stakeholders: technologists, standardization, activists...
- Mission: Developing sustainable and privacy-preserving computer systems by bringing together computer science & human-centric behavioral science



Privacy & Sustainable Computing Lab

The increasing ubiquity of IT and data in corporate infrastructures and innovation endeavours, as well as the rising pervasiveness of computing in our daily lives, leads to the question how information systems can be build in a private, secure, ethical and value-driven manner. Current IT systems often fail to deliver on these requirements, commonly characterised as "soft" requirements, while aspects of technical functionality dominate.

The Privacy & Sustainable Computing Lab aims at setting new standards in research, education and practice to address ethical issues in computing.

http://www.privacylab.at/



Dr. Sabrina Kirrane (Director)



Prof. Sarah Spiekermann (Founder)



Dr. Ben Wagner (Director)



Prof. Axel Polleres (Founder)

Green Big Data A multidisciplinary perspective...



Online Privacy
Public Policy and Legislation

Ethical Design
Image: Compare the second sec

Humanities Net Neutrality Fragmentation Open Data Open Standards



Computer Science Big Data Analytics

Artificial Intelligence

Data Science



What we stand for?







Autonomy, S Algorithms & Technology Policy

Semantic Technology, Data Analytics y & Privacy



r, Ethical System Design, Privacy, Behavior



Web Standards, Data Management, Open Data



Ethical System Design



Privacy Risk & Compliance



Semantic Web Prive Standards Policy & L Languages & Licenses



Privacy Notices Trans & User Issues & Psyce Data O



Transparency & Psychological Data Ownership



Efficient Data Management, Compression & Encryption



Privacy by Design: Privacy Patterns



Software Engineers & Ethics



Cyber-Security, Risk & Technology in Society





Who we are working with?



Our regulatory framework

The General Data Protection Regulation (GDPR)

- Goal: Enhancing trust in digital services and security
 - Applies to personal data of EU residents, regardless of the company's location

Companies whose business models rely on personal data

Data subjects who would like to declare, monitor and optionally revoke their (often not explicit) preferences on data sharing



Regulators who can leverage technical means to check compliance with the GDPR





Protection Regulation

Our regulatory framework

The General Data Protection Regulation (GDPR)



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Our project SPECIAL (EU Horizon 2020)







Horizon 2020 European Union funding for Research & Innovation

https://www.specialprivacy.eu/

This project receives funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 731601

















- Policy management framework
 - Gives users control of their personal data
 - Represents and integrates access/usage policies and legislative requirements in a machine readable format (vocabulary)
- Transparency and compliance framework
 - Provides information on how data is processed and with whom it is shared
 - Allows data subjects to take corrective action
- Scalable policy-aware Big Data architecture
 - Build on top of the Big Data Europe (BDE) platform scalability and elasticity mechanisms
 - Extended BDE with robust policy, transparency and compliance protocols













- Enable the acquisition of user consent at in a dynamic fashion
- Provide transparency on how data is processed and with whom it is shared
- Automatically verify compliance with usage control policies specified by data subjects, and legal obligations specified in the GDPR

Data owner has more transparency & high dependency on legal enforcement



What are we doing in terms of standardisation





Take-home messages

COMPLEXITY SCIENCE HUB VIENNA WINNERF WINNERF

- Questions regarding Ethics/Privacy/GDPR?
 - Privacy & Sustainable Computing Lab at WU University
- Big Data can be "green"
 - SPECIAL EU project deals with privacy-preserving technologies in Big Data



Thank you!

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Kudos to Sabrina Kirrane for her input in this presentation

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