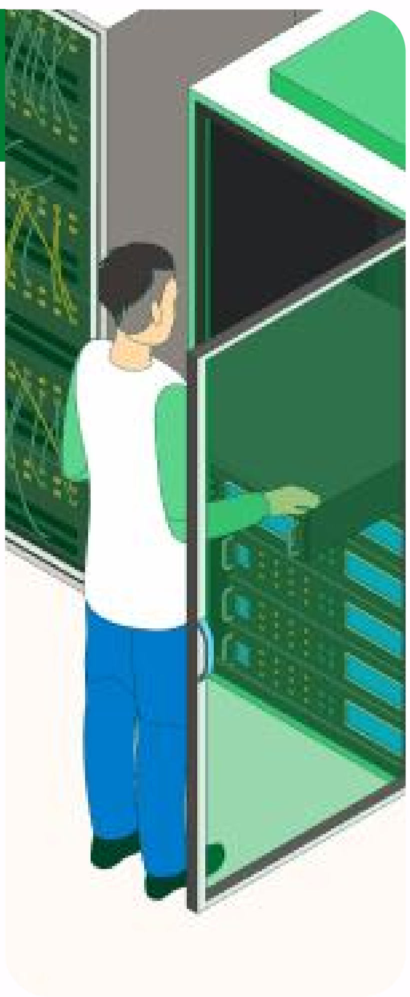
Main privacy enhancement technologies

Data obfuscation tools

Technology	Potential application	Challenges and limitations
Anonymisation / pseudonymisation	Secure storage	● Ensuring information does not leak (re-identification risk) ● Amplified bias, especially in synthetic data ● Lack of sufficient skills and expertise
Synthetic data	Machine learning with privacy preservation	
Differential privacy	Expanding research opportunities	
Zero-knowledge proofs	Information verification without the need to disclose it (e.g. age verification)	Applications are still in early stages

Encrypted data processing tools



Technology	Potential application	Challenges and limitations
Homomorphic encryption	● Calculations on encrypted data within the same organisation ● Processing of data too sensitive to disclose ● Tracing or discovering contacts	● Challenges in data cleaning ● Ensuring information does not leak ● Higher computational costs
Multiparty computation (including private set intersection)		
Trusted Execution Environments	Computing with models that must remain private	● Higher computational costs ● Digital security challenges

Federated and distributed analytics

Technology	Potential application	Challenges and limitations
Federated learning	Machine learning with privacy preservation	● Reliable connectivity needed ● Information about data models must be available to the data processor
Distributed analytics		

Data accountability tools

Technology	Potential application	Challenges and limitations
Accountability systems	● Setting and enforcing rules on when data can be accessed ● Immutable tracking of data access by data controllers	● Limited use cases and lack of autonomous applications ● Configuration complexity ● Privacy and data protection compliance risks when using distributed ledger technologies (DLT) ● Digital security challenges ● Not strictly considered PETs
Threshold secret sharing		
Personal data stores / Personal Information Management Systems (PIMS)	Give data subjects control over their own data	

Source: Report '[Emerging privacy enhancing technologies: current regulatory and policy approaches](#)'. OECD March 2023.