

Mykyta Petik

IMPLEMENTING PRIVACY REQUIREMENTS IN SOFTWARE PROJECTS







THIS PROJECT HAS RECEIVED FUNDING FROM THE EUROPEAN UNION'S HORIZON 2020 RESEARCH & INNOVATION PROGRAMME UNDER THE MARIE SKLODOWSKA-CURIE PROGRAM – ITN EUROPEAN INDUSTRIAL DOCTORATE, GRANT AGREEMENT NO. 814035.



Points (1)

- Difference in terminology
- Why treat data protection seriously and when it may cost lives?
- Background information
- General data protection regulation (GDPR)
- Why should IT people care?
- Data protection by design (DPbD) (and by default)
- Data Processing Impact Assessment (DPIA)
- DPbD in SDLC
- SDLC use case
- GDPR and SDLC
- Things to consider and challenges
- Questions



Points (2)

This presentation does not provide a strict, tailored, an/or rigid explanation for each activity in the Agile development process.

The goal is to give an overview of legal issues to take into account when implementing privacy and security requirements in your software development projects.



Privacy, security and data protection

Privacy – a broad concept – "Everyone has the right to respect for his private and family life, his home and his correspondence" – Art. 8 of ECHR

"Everyone has the right to respect for his or her private and family life, home and communications" – Art. 7 of CFREU

Security – characteristic; secure way of handling data – "Personal data are in many cases compromised as a result of incidents" – Recital 63 of NIS Directive

"ICT products, ICT services and ICT processes are secure by default and by design" – Art. 51 of Cybersecurity Act

'Secure processing environment' – Proposal for Data Governance Act

Data protection – automated decision-making – "The protection of natural persons in relation to the processing of personal data is a fundamental right" – Recital 1 of GDPR

"The right to the protection of personal data is not an absolute right; it must be considered in relation to its function in society and be balanced against other fundamental rights, in accordance with the principle of proportionality" – Recital 4 of GDPR

Why treat privacy and data protection seriously?

- Use of records for profiling, political oppression, ethnic cleansings
 - Gestapo in 1930s and 1940s
 - Stasi in 1950s-1980s
- Both examples contributed to the reform of data protection and privacy laws in West Germany [a]
- Mass surveillance by modern states
 - China, Russia, US
- Recent example:
- Government records hacked and/or leaked by local collaborators to Russian forces, who used them to execute civilians in Ukraine [b]

[a]Iphofen, R., & O'Mathúna, D. (2021). Ethical Issues in Covert, Security and Surveillance Research. Van Haren Publishing. [b] https://www.5.ua/suspilstvo/znaly-do-koho-idut-u-buchi-rashysty-vbyvaly-liudei-za-skladenymy-zazdalehid-spyskamy-miskyi-holova-275654.html



General Data Protection Regulation (GDPR)

- One of the most comprehensive legal documents in the world aimed at regulating personal data processing
 - Many countries follow the example
- Risk-based approach
 - At least this was the idea, but we can still take advantage of it
- A single legal document to regulate data protection in the EU
 - Kind of
- •Applicable in the EU from 25 May 2018
 - We still have no idea what to do with it
- Replaces the Data Protection Directive 95/46/EC (and national laws)
 - Far from perfect



GDPR – what is personal data?

Personal data (4 elements)

- (1) any information
- (2) relating
- (3) to an identified or identifiable
- (4) natural person





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Art. 5 GDPR – Principles relating to processing of personal data

Lawfulness, fairness and transparency

Purpose limitation

Data minimisation

Accuracy

Storage limitation

Integrity and confidentiality (security)

Accountability



Rights of the data subject

- Right of access by the data subject
- Right to rectification
- Right to erasure ('right to be forgotten')
 - Google CJEU case
- Right to restrict processing
- Right to be informed
- Right to data portability
- Right to object



• Right not to be subject to a decision based solely on automated processing

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GDPR Compliance for SDLC (1)

- Appropriate technical and organizational measures
- Internal documentation of data policies and procedures
- Designation of Data Protection Officer
- Data protection impact assessment (DPIA)
- Data Protection by Design (and by default)
- Data subjects' rights
- Cooperation with national DPAs
 - Huge problem for Big Tech



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GDPR Compliance for SDLC (2)

Appropriate technical and organizational measures:

'security principle'

- Doing this requires you to consider things like risk analysis, organisational policies, and physical and technical measures
- State of the art and costs of implementation
- Pseudonymisation and encryption
- 'confidentiality, integrity and availability' of your systems and services and the personal data
- restore access and availability to personal data in a timely manner



Monitor effectiveness

Icons by ultimatearm via Flaticon.com Recommendations based on UK ICO – ico.org.uk



Why should the IT crowd care?

- Data protection by design (DPbD)
 - The same as Privacy by Design (PbD)?
 - The gap between the Law and Software Engineering Practices
- Technical and Organizational Measures (TOMs) necessary for compliance
 - Loose set of rules
- Data Protection Impact Assessment (DPIA) as an element of risk-management system
 - A major issue for IT companies



Data Protection by Design

WHY? HOW? WHEN?

03/11/2022

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Privacy by Design (1)

Privacy must be incorporated into networked data systems and technologies by default. Privacy must become integral to organizational priorities, project objectives, design processes and planning operations. Privacy must be embedded into every standard, protocol and process that touches our lives.

- Ann Cavoukian, Ph.D.

Information & Privacy Commissioner, Ontario, Canada



Privacy by Design (2)

7 principles of Privacy by Design Proactive not Reactive; Preventative not Remedial Privacy as the Default Privacy Embedded into Design Full Functionality—Positive-Sum, not Zero-Sum End-to-End Security—Lifecycle Protection Visibility and Transparency **Respect for User**



Data Protection by Design (1)

"Taking into account the state of the art, the cost of implementation and the nature, scope, context and purposes of processing as well as the risks of varying likelihood and severity for rights and freedoms of natural persons posed by the processing, the controller shall, both at the time of the determination of the means for processing and at the time of the processing itself, implement appropriate technical and organisational measures, such as pseudonymisation, which are designed to implement data-protection principles, such as data minimisation, in an effective manner and to integrate the necessary safeguards into the processing in order to meet the requirements of this Regulation and protect the rights of data subjects."

- Art. 25 GDPR



Data Protection by Design (2)

"Always think about personal data protection when developing something. Apply necessary measures based on state of the art, their effectiveness, cost, and risks for users"

- Mundane interpretation



Data Protection by Design (3)

- State of the art
- Cost of implementation
- Nature, scope, context and purposes of processing
- Risks for rights and freedoms of natural persons
- At the time of the determination of the means for processing and at the time of the processing
- Implement appropriate technical and organisational measures
- Designed to implement data-protection principles





Data Protection by Design (4)

According to Articles 24(1) and 25(1) GDPR controllers are under the obligation to:

- Adopt a risk-based approach
 - W.r.t. state of the art, cost of implementation, nature, scope, context and purposes of the processing, risks for data subject's rights and freedoms
- Implement appropriate **technical** and **organisational** measures
 - Suggests a close collaboration between **IT and legal experts**
- Ensure and demonstrate compliance with the Regulation
 - Requires the implementation of appropriate mitigation strategies
 - Requires a layer of demonstrability (accountability)
- Both at the time of the determination of the means for processing and at the time of the processing itself
 - Design stage + throughout the entire data processing lifecycle



Data Protection by Design – in SDLC

- The idea is not new
 - LegalTech, Automatization of GDPR compliance, AI for IT Lawyers...
- Interaction between legal texts and code (law and software)
- Struggle to define terms and explain things clearly
- Technical v. legal terminology
- Technical v. legal risks and mitigation strategies
- Stakeholders' concerns are different

Based on Pierre Dewitte and Laurens Sion -Bridging the Gap between Legal and Software Engineering Practices - A prerequisite for Data Protection by Design





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Data protection:

- Team
- Knowledge
- Skills
- Methodology





Privacy Requirements engineering:

- categories of personal data
- user
- owner of the data
- controller
- processor
- risk management
- DP principles
- Data Protection by Design
- DPIA





Reflection of the DP analysis in design:

- Data minimization mechanisms
- Security of data
- Optimization of processing less is better
- Documentation of processing activities
- Data Protection by Design
- Data subject's rights





Reflection of the DP analysis in design:

- Tools
- Re-thinking software modules and elements after initial deploy
- Code and processes review
- Data Protection by Design





Check and control:

- Check the implementation of privacy, data security and DP requirements
- Threat model review
- Processes review
- Data Protection by Design



Privacy and Agile software development (1)

Basic principles of integrating privacy requirements in Agile:

- Closely related to security both application and information;
- Consider creating specific (e.g. GDPR storage limitation principle integration) requirements. Privacy is not a single, standalone issue;
- Privacy should come in epics and stories in the overall product backlog;
- Regular reviews involving all team members responsible, especially DPO/Legal counsel.





Privacy and Agile software development (2)

- Specific legal requirements should become a crucial part of the risk-management process;
- List all relevant privacy and security legal compliance requirements and track them;
- Consider the cost, but almost always opt-out for better privacy and security;
- Follow GDPR principles throughout the SDLC process. Don't consider compliance as a certain state, it's a continuous process.



GDPR provisions and SDLC (1)

It is de-facto required by law to implement GDPR into SDLC, unless you do not work with personal data

 Recital 78 ('appropriate technical and organisational measures', 'internal policies and implement measures', minimization, pseudonimization) and Article 25 GDPR (DPbD)



GDPR provisions and SDLC (2)

It is required to use encryption, anonymization, and pseudonymization, yet it does not guarantee compliance

• Recitals 26, 28, 29, 78, 83 and Art. 6(4)(e) and Art. 32(1)(a) GDPR



GDPR provisions and SDLC (3)

Inform the data subject about their rights and what you do with their data in a clear manner (Privacy Policy)

• Recitals 39 ('easily accessible and easy to understand'), 58 ('easily accessible and easy to understand', 'clear and plain language' 'visualisation') and Art. 12(1) and Art. 13(2) GDPR



GDPR provisions and SDLC (4)

It is required to always monitor and communicate with third parties who store user's personal data. It is a legal obligation to inform them, if the user asked us to erase their personal data

 Recital 66 ('controller who has made the personal data public should be obliged to inform the controllers which are processing such personal data to erase any links to, or copies or replications of those personal data') and Art.
19 GDPR



GDPR provisions and SDLC (5)

It is a legal obligation to adhere to a retention period

• Art. 13(2)(a) GDPR



DPIA and SDLC (1)

A Data Protection Impact Assessment (DPIA) is a process to help you identify and minimise the data protection risks of a software project. You must do a DPIA for processing that is **likely to result in a high risk** to individuals.

Your DPIA must:

- describe the nature, scope, context and purposes of the processing;
- assess necessity, proportionality and compliance measures;
- identify and assess risks to individuals; and
- identify any additional measures to mitigate those risks;
- consider severity and likelihood.



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DPIA and SDLC (2) – DPbD



Based on Pierre Dewitte and Laurens Sion -Bridging the Gap between Legal and Software Engineering Practices - A prerequisite for Data Protection by Design

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Things to consider

- Developer training
- Jurisdiction and applicable law
- Tools and methods for compliance
- Risk Management
- Data protection is crucial for MA and due diligence
- Involvement of Legal Counsel and DPO
- Response to inquiries consumers and authorities



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Challenges

- Unclear regulations and lack of case law
- Lack of qualified specialists
- State of the art



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What happens in the future?



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What happens in the future?

nobody knows



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Questions?



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mykyta.petik@kuleuven.be

LinkedIn: Mykyta Petik

Thank you!