Presentation of a research paper written by Guy Waizel

Title: The potential effect of recent EU regulations on cloud adoption and EU cyber resilience

Presenter: Guy Waizel
PhD Student, MBA, BSc

Fundamental Field: Social Sciences| Field of Science: Economic Sciences| Doctoral Field: Marketing
Supervisor: Prof. Adriana Zait

Current work experience: Director, Global Business Operations and
Manager of Cyber of Excellence Center, Commvault
Background: 25 years of experience in the high-tech industry and more than 10 years in cybersecurity

"Alexandru Ioan Cuza" University of Iasi / May – 2023

Introduction- The NIS2 Directive

Network and Information Security Directive 2 (NIS2) will affect all EU important and essential sectors

The main objectives of the directive:

- Improve cybersecurity throughout the EU by defining critical sectors based on size.
- Greater focus on cybersecurity efficiency
- Addressing supply chain threats
- Defining supervisory measures
- Developing better cooperation between member states
- Increasing threat and information-sharing opportunities

Timeline: October 2024

(Directive (EU) 2022/2555, 2022; NIS 2 Directive, 2023).

Source: pixabay.com (free download images)

Introduction- The DORA Act

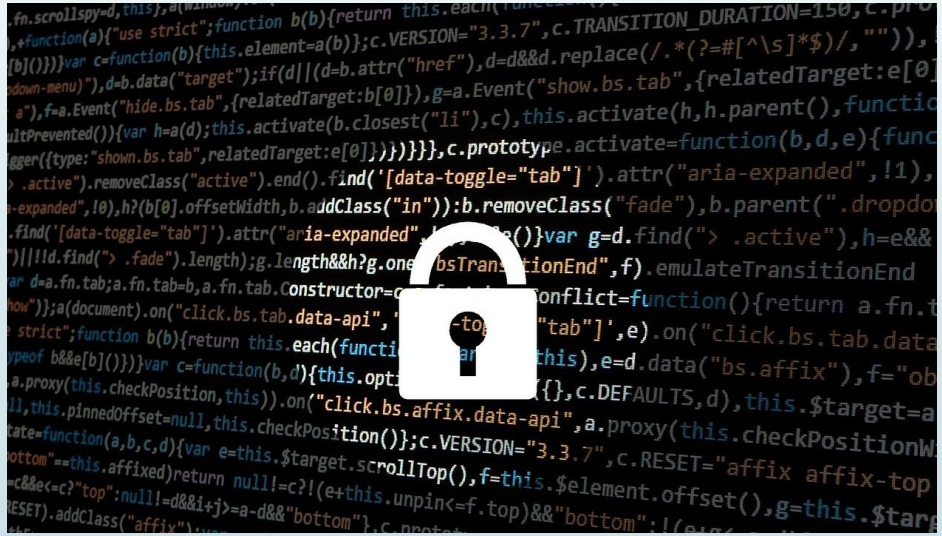
The Digital Operation Resilience Act (DORA) will affect the entire EU financial sector

The main objectives of the Act:

- New risk management rules for information and communication technology (ICT)
- Incident reporting
- Resilience testing
- ICT third-party risk monitoring
- Contractual relationships with vendors

Timeline: January 2025

(Digital Operational Resilience Act (Regulation (EU) 2022/2554, 2022; DORA, 2023).



Source: pixabay.com (free download images)

The aim of the research paper

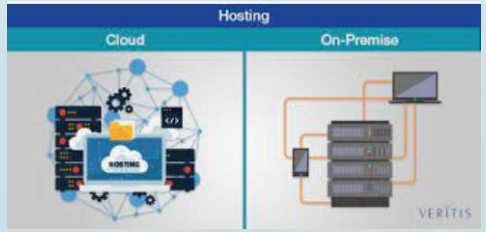
- Identify the potential effect of NIS2 and DORA on modern cloud adoption among various organizations that will need to comply with the regulations
- Examine the effect on overall resilience in the EU
- Serves as an initial wake-up call for organizations

key concepts

Cloud Adoption

Source: (Stoke Adobe,, 2023)

On-premises vs. Cloud



Source: (*Veritas, 2023)*

Literature review - the GDPR effect on organizations

The General Data Protection Regulation (GDPR)

(Regulation (EU) 2016/679, 2018)

Organizations adjusted changes in:

- Business processes and workflows
- Mapping risks in databases
- Marketing campaign strategies
- Sales activity
- Product development
- Corporate websites
- Operations activity

Source: pixabay.com (free download images)

Still…

Many organizations were breached and fined for not complying with the regulation

Literature review - the GDPR effect on cloud service providers

Cloud service providers implemented GDPR features in 2018

Category	Pattern title	Solutions in AWS	Solutions in Azure
Compliance and Regulatory	**Data Citizenship**	Use AWS location tags to designate the location for data processing	Azure information protection and location tag. Azure frontdoor service
	Cryptographic Erasure	Use AWS KMS	Use Azure Key Vault
	Shared Responsibility Model	AWS provides different services to ensure protection of data and system. It is upto client to use it or not. However, AWS is responsible for only the vailability and basic security of cloud platform.	Azure provides different security tools to ensure protection of data and system. It is upto client to use it or not. However, Azure is responsible for only the vailability and basic security of cloud platform
	Compliant Data Transfer	AWS locaton tags	Azure location tag
	Data Retention	The data retention policies can be defined and executed by AWS. For example Lambda	Azure provides option to define data retention policy in Database system
	Data Lifecycle	AWS data lifecycle manager	Azure blob storage lifecycle
	Intentional Data Remanence	database (e.g. DynamoDB)	database (e.g. Azure backup)
Identification, Authentication and Authorisation	**Multi-Factor Authentication**	AWS Cognito	Azure active directory : multi-factor
	Federation (Single Sign-On)	AWS SSO (Single Sign-On)	Azure AD Seamless Single Sign-On
	Access Token	AWS security token service	Azure active directory : Token service
	Mutual Authentication	Use AWS TLS/SSL certificate, Certificate feature of API Gateway (AWS client VPN)	Azure App service
	Secure User Onboarding	AWS customer on boarding	Azure security center
	Identity and Access Manager	AWS IAM and Cognito	Azure IAM
	Per-request Authentication	AWS Signing and Authenticating REST Requests	Azure API management & REST API authentication
	Access Control Clearance	AWS cloud watch and AWS Cognito/IAM	Azure access control service
Secure Development, Operation and Administration	**Bastion Server**	AWS bastion host	Azure Bastion host
	Automated Threat Detection	AWS GuardDuty	Azure advanced threat protection
	Durable Availability	AWS cloud watch, AWS WAF	Azure web access firewall & firewall application gateway
	Economic Durability	AWS cloud watch	Azure Monitor
	Vulnerability Management	AWS vulnerability scanning	Vulnerability scan in Azure security center
Privacy and Confidentiality	**End-to-End Security**	AWS KMS, Certificate manager	Azure Key Vault
	Computation on Encrypted Data	N/A	N/A
	Data Anonymisation	Algorithms can be defined and ran by AWS module (e.g. lambda)	Azure provides Dynamic Data Masking on SQL database
	Processing Purpose Control	N/A	N/A
Secure Architecture	**Virtual Network**	AWS Virtual Private Cloud	Azure Virtual Network
	Web Application Firewall	AWS WAF	Azure application firewall gateway
	Secure Element	AWS IoT Device Management	Azure IoT Hub & IoT Suit
	Secure Cold Storage	AWS Glacier	Azure Coldblob storage
	Certificate and Key Manager	AWS Certificate and Key manager (AWS KMS)	Azure Key Vault
	Hardware Security Module	AWS CloudHSM	Azure Dedicated HSM
	Secure Auditing	AWS Auditing Security Checklist	Azure Monitor, Stream, Network Watcher

Source: (Spasic, B *et al.*, 2019)

Method

- A mixed method of
  - Descriptive literature review

    (King, W. R., & He, J., 2005; Pare, G et al., 2015; Petersen, K et al., 2015)
  - Narrative review

    (Cronin et al., 2008; Green et al., 2006; Levy & Ellis, 2006; Webster & Watson, 2002)

- Qualitative techniques
  - Content analysis
  - Narrative analysis
  - Thematic synthesis

Source: pixabay.com (free download images)

Method

Source: pixabay.com (free download images)

- Descriptive literature review
  - Initial search within four databases
  - Identifying and exploring the literature that focuses on the topic
  - Evaluation and analysis
  - Piling the literature by the main concept categories
  - Organizing the information in a table and sorting the key findings

Article Title	Author & Published Year	Main Theme	Aim	Conclusion	Common Findings/Gaps and Relation to the Topic	Disciplines	Reference

- Techniques used
  - Content analysis→ exploring main themes
  - Keyword frequencies analysis → uncovering trends and connections
  - Thematic narrative synthesis

Method

Source: pixabay.com (free download images)

- Four different databases were used:

Google Scholar, Proquest, Science Open and Base-search.net

- Search keywords and phrases that were used:

"NIS2 Directive"; "DORA regulation"; "DORA Act"; "EU recent regulations (2020-2023)"; "effect of NIS2 and DORA on cloud adoption"; "effect of NIS2 and DORA on cybersecurity and resilience"; "data privacy and cloud adoption"; "GDPR effects"; "data privacy regulations(2011+)"; "Directive(EU)2022/2555"; "Regulation (EU)2022/2554"; "digital operational resilience for the financial sector".

- Literature review inclusion criteria
  - Most relevant to the article's topic aim and disciplines
  - Article types: scholarly journals, books, dissertations and theses, and papers responding to the latest regulations and announcements.

Results-Identified themes

Initial search results yielded **160+** articles
55 articles passed the descriptive literature inclusion criteria
4 themes were identified

Theme	Count of Articles
Challenges in adopting data privacy regulations	12
Fines following infringement of data privacy regulations	3
Responses and actions related to data privacy regulations	20
Data privacy regulations in the cloud and preserving privacy methods	20

Results-Identified themes

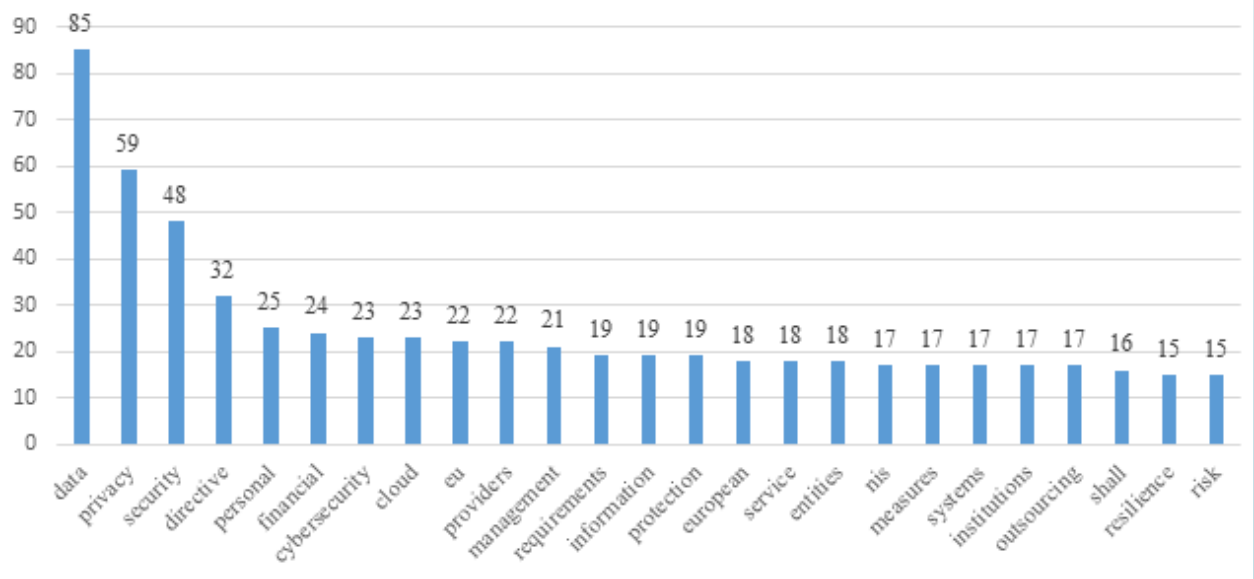
Theme	Theme's Reference	Year
1. Challenges in adopting data privacy regulations	Barbara, C. G. et al	2001
	Nauwelaerts, W	2004
	Taylor, P	2011
	Chazan, G	2017
	Cutler, S	2018
	Ross, W	2018
	Newstex	2019
	Bartlett, T	2020
	Tzanou, M	2020
	Jacuch, A., PhD	2021
	Perdereaux-Weekes, A	2021
	Biasin, E., & Kamenjasevic, E	2022
2. Fines following infringement of data privacy regulations	Murgia, M., & Coulter, M.	2019
	Ford, A et al	2021
	Venkataramakrishnan, S	2021
3. Responses and actions related to data privacy regulations	EBA	2019
	Copeland, L., Jr	2021
	EIOPA	2020
	ESMA	2020
	ITI	2021
	NIS2	2021
	Rajamäki, J	2021
	ITI	2021
	Targeted News Service, Washington, D.C	2021
	Schmitz-Berndt, S., & Chiara, P. G	2022
	Splunk	2022
	Targeted News Service, Washington, D.C	2022
	DORA	2022
	GDPR	2023
	Google	2023a,2023b,2023c
	MENA Report, London: SyndiGate Media Inc	2023
	Microsoft	2023a,2023b
4. Data privacy regulations in the cloud and preserving privacy methods	Machanavajjhala,A. et al	2007
	Corliss, M	2010
	Ko, S. Y. et al	2011
	Domingo-Ferrer, J., & Soria-Comas, J	2015
	Jain, P., Gyanchandani,M., & Khare, N	2016
	Express Computer, Mumbai	2018
	Singh, N., & Singh, A. K	2018
	CommunicationsToday, Noida	2019
	Spasic, B. et al	2019
	Alnajrani, H. M., & Norman, A. A	2020
	Georgiou, D., & Lambrinoudakis	2020
	Mahanan, W. et al	2021
	Raghavan, A. et al	2021
	Amiri-Zarandi. et al	2022
	Glova, A. O	2022
	Gartner	2023
	Google	2023a,2023b,2023c
	Johnson, G. et al	2023

Results-keywords frequency analysis

The lack of specific literature about NIS2 and DORA emphasizes the importance of this article

Top 50 keywords in the article abstracts

Abstracts word frequency



Top narrative analysis and thematic synthesis

- Balance is required between data privacy regulations and technology adoption
- Data privacy preservations algorithms and technologies will assist with easier compliance
- IoT vendors must address data privacy by design (PbD)
- New directives will have a significant effect outside of the EU as well
- Fines, sanctions, and enforcement are expected to rise
- Data privacy regulations may slow down startups and new organizational developments
- Some EU member states would need to invest much more than others
- More budget and investments are expected to be allocated for resilience and cybersecurity
- More sharing between member states (joint knowledgebases/ vulnerability disclosure/processes)
- Ransomware attacks, advanced persistent threats and supply chain attacks are expected to grow
- Contractors' terms and contracts will need to be reevaluated and assessed

Source: pixabay.com (free download images)

Discussion

Source: pixabay.com (free download images)

- A gap in knowledge and a lack of discussion about NIS2 and DORA
- Challenges with preparation for the regulations
- Hundreds of thousands of organizations are expected to be affected. (penalties ranging from seven to ten million euros or 1.4%-2% of their global annual turnover)
- Under the DORA regulations, critical ICT third-party service providers can face fines of up to 1% of their average daily worldwide turnover.
- Organizations with global turnovers of billions of dollars may get fined to even hundreds of millions of dollars.
- Cloud providers and enterprise software vendors should assist and listen to their customers
- Early warning detection and resilience tools are key technologies to comply with the regulations
- Organizations with above 250 employees meeting the newly defined important and essential sectors should prepare themselves to comply with the regulations to avoid severe penalties

The on-premises/cloud compliance paradox

Over the last decade, data privacy regulations mainly delayed cloud adoption, From GDPR Directive and within the following years, new data privacy regulations such as NIS2 and DORA are expected not only not to delay but even accelerate cloud adoption.

- Organizations were reluctant to migrate to the cloud **because** of data privacy
- (Bhayal, 2011; Boillat & Legner, 2013; Gai, 2014; Gumbi & Mnkandla, 2015; Griffith & Stewart 2020; Ivan & Ille, 2021; Meersman & Mulchahey, 2019; Taylor, 2018).
- GDPR **accelerated** the adoption of cloud technologies

(Spasic, B *et al.*, 2019)

- Government embraced cloud adoption-"Guidelines on outsourcing to cloud service providers"

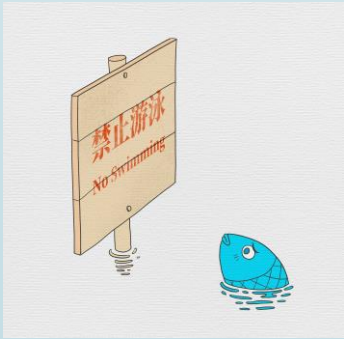
(EIOPA, 2019).

- Cloud adoption is expected to grow (even at organizations that were reluctant to migrate)

(IDC, 2022)

- NIS2 and DORA are expected to **accelerate even more** cloud adoption

Further research is recommended to be done on the readiness of specific member states that are lagging behind in their reaction to the new regulations, the effect of NIS2 and DORA on on-premises environments, and the broader effect of NIS2 and DORA on other continents.



Source: pixabay.com (free download images)

References

Alnajrani, H. M., & Norman, A. A. (2020). The effects of applying privacy by design to preserve privacy and personal data protection in mobile cloud computing: An exploratory study. Symmetry, 12(12), 2039.

Amiri-Zarandi, M., Dara, R. A., Duncan, E., & Fraser, E. D. G. (2022). Big Data Privacy in Smart Farming: A Review. Sustainability, 14(15), 9120. https://doi.org/10.3390/su14159120

Barbara, C. G., Lynch, P., & Maranik, S. J. (2001). US multinational employers: Navigating through the "safe harbor" principles to comply with the EU data privacy directive. American Business Law Journal, 38(4), 735-783.

Bartlett, T. (2020). Privacy and Security Management Practices of Emerging Technologies: Internet of Things (Order No. 28000028). Available from Publicly Available Content Database. (2461614134).

Bhayal, S., 2011. A study of security in cloud computing. California State University, Long Beach.

Biasin, E., & Kamenjašević, E. (2022). Cybersecurity of medical devices: new challenges arising from the AI Act and NIS 2 Directive proposals. International Cybersecurity Law Review, 3(1), 163-180.

Boillat, T. and Legner, C., 2013. From on-premise software to cloud services: the impact of cloud computing on enterprise software vendors' business models. Journal of theoretical and applied electronic commerce | research, 8(3), pp.39-58.

Chazan, G. (2017). SAP raises fears over EU data privacy rules. FT.Com,

Computer, E. (2018). 83% Indian IT security practitioners believe managing privacy & data protection regulations in cloud is more complicated than on-premises networks. Express Computer

Copeland, L., Jr. (2021). Developing National Cybersecurity Data and Privacy Protection (Order No. 28963520). Available from Publicly Available Content Database. (2634881999).

Corliss, M. (2010). The use of information: How new technology is changing discussions of privacy (Order No. 1475484). Available from Publicly Available Content Database. (305206632).

Cronin, P., Ryan, F., & Coughlan, M. (2008). Undertaking a literature review: a step-by-step approach. British journal of nursing, 17(1), 38-43.

Cutler, S. (2018). THE FACE-OFF BETWEEN DATA PRIVACY AND DISCOVERY: WHY US COURTS SHOULD RESPECT EU DATA PRIVACY LAW WHEN CONSIDERING THE PRODUCTION OF PROTECTED INFORMATION. Boston College Law School Boston College Law Review, 59(4), 1513-1540.

Digital Operational Resilience Act (DORA) - Regulation (EU) 2022/2554 (2022). Available at: https://www.digital-operational-resilience-act.com/ (Accessed: 26 February 2023).

Directive (EU) 2022/2555 of the European Parliament and of the Council of 14 December 2022 on measures for a high common level of cybersecurity across the Union, amending Regulation (EU) No 910/2014 and Directive (EU) 2018/1972, and repealing Directive (EU) 2016/1148.(2022) https://eur-lex.europa.eu/eli/dir/2022/2555/oj

Domingo-Ferrer, J., & Soria-Comas, J. (2015). From t-closeness to differential privacy and vice versa in data anonymization. Knowledge-Based Systems, 74, 151-158.

ESMA publishes cloud outsourcing guidelines. (2023). Retrieved 30 March 2023, from https://www.esma.europa.eu/press-news/esma-news/esma-publishes-cloud-outsourcing-guidelines

Finland - NIS2 Directive strengthens cybersecurity across the EU National implementation launched in January. (2023, Jan 11). MENA Report London: SyndiGate Media Inc

Ford, A., Al-Nemrat, A., Ghorashi, S. A., & Davidson, J. (2021). The Impact of GDPR Infringement Fines on the Market Value of Firms. Academic Conferences International Limited. https://doi.org/10.34190/EWS.21.088

Free Word Cloud Generator. (2023). Retrieved 2 April 2023, from https://www.freewordcloudgenerator.com/generatewordcloud

Gai, K., 2014. A review of leveraging private cloud computing in financial service institutions: Value propositions and current performances. Int. J. Comput. Appl., 95(3), pp.40-44.

Gartner Says By 2023, 65% of the World's Population Will Have Its Personal Data Covered Under Modern Privacy Regulations (2023). Available at: https://www.gartner.com/en/newsroom/press-releases/2020-09-14-gartner-says-by-2023--65--of-the-world-s-population-w (Accessed: 26 February 2023).

General Data Protection Regulation (GDPR) Regulation (EU) 2016/679 (2018) – Official Legal Text (2023). Available at: https://gdpr-info.eu/ (Accessed: 26 February 2023).

Georgiou, D., & Lambrinoudakis, C. (2020). Compatibility of a security policy for a cloud-based healthcare system with the EU general data protection regulation (GDPR). Information, 11(12), 586.

Glova, A. O. (2022). Architectural Support and Modeling of Emerging Technologies for Datacenter Privacy and Security Applications (Order No. 29325081). Available from Publicly Available Content Database. (2729050668).

Google (2023a), 8 megatrends drive cloud adoption—and improve security for all | Google Cloud Blog. (2023). Retrieved 25 March 2023, from https://cloud.google.com/blog/products/identity-security/8-megatrends-drive-cloud-adoption-and-improve-security-for-all

Google (2023b), DORA's implementation period starts now. What we're doing to prepare for the new law | Google Cloud Blog. (2023). Retrieved 25 March 2023, from https://cloud.google.com/blog/products/identity-security/doras-implementation-period-starts-now-what-were-doing-to-prepare-for-the-new-law

Google (2023c), How Google Cloud is preparing for NIS2 and supporting a stronger European cyber ecosystem | Google Cloud Blog. (2023). Retrieved 25 March 2023, from https://cloud.google.com/blog/products/identity-security/how-google-cloud-is-preparing-for-nis2-and-protecting-europe-from-cyber-threats

Green, B. N., Johnson, C. D., & Adams, A. (2006). Writing narrative literature reviews for peer-reviewed journals: secrets of the trade. Journal of chiropractic medicine, 5(3), 101-117.

Griffith, L D. 2020, Strategies Federal Government I.T. Project Managers Use to Migrate I.T. Systems to the Cloud, Walden University.

Guidelines on outsourcing arrangements - European Banking Authority. (2019). Retrieved 30 March 2023, from https://www.eba.europa.eu/regulation-and-policy/internal-governance/guidelines-on-outsourcing-arrangements

Guidelines on outsourcing to cloud service providers. (2023). Retrieved 30 March 2023, from https://www.eiopa.europa.eu/publications/guidelines-outsourcing-cloud-service-providers_en

Gumbi, L.N. and Mnkandla, E., 2015. Investigating South African Vendors' cloud computing value proposition to small, medium and micro enterprises: a case of the City of Tshwane Metropolitan Municipality. The African Journal of Information Systems, 7(4), p.1.

IBM Unveils Z15 With Industry-First Data Privacy Capabilities. (2019). Communications Today

Information Technology Industry Council: Tech Industry Welcomes Vote on NIS2 Directive. (2021, Oct 29). Targeted News Service

ITI Offers Recommendations for NIS2 Trilogue Negotiations (2022). Washington, DC.

ITI: Tech Industry Welcomes Vote on NIS2 Directive (2021). Washington, DC.

Ivan, T.R. and Ille, E.E., 2021. Applying Multi-Criteria Decision-Making to the Technology Investment Decision-Making Process. Acquisition Research Program.

Jacuch, A., PhD. (2021). COMPARATIVE ANALYSIS OF CYBERSECURITY STRATEGIES. EUROPEAN UNION STRATEGY AND POLICIES. POLISH AND SELECTED COUNTRIES STRATEGIES. On - Line Journal Modelling the New Europe, (37), 102-120. https://doi.org/10.24193/OJMNE.2021.37.06

Jain, P., Gyanchandani, M., & Khare, N. (2016). Big data privacy: a technological perspective and review. Journal of Big Data, 3(1), 1-25. https://doi.org/10.1186/s40537-016-0059-y

Johnson, G. A., Shriver, S. K., & Goldberg, S. G. (2023). Privacy and market concentration: intended and unintended consequences of the GDPR. Management Science.

King, W. R., & He, J. (2005). Understanding the role and methods of meta-analysis in IS research. Communications of the Association for Information Systems, 16(1), 32.

Ko, S. Y., Jeon, K., & Morales, R. (2011). The HybrEx Model for Confidentiality and Privacy in Cloud Computing. HotCloud, 11, 8-8.

Levy, Y., & Ellis, T. J. (2006). A systems approach to conduct an effective literature review in support of information systems research. Informing Science, 9.

Machanavajjhala, A., Kifer, D., Gehrke, J., & Venkitasubramaniam, M. (2007). l-diversity: Privacy beyond k-anonymity. ACM Transactions on Knowledge Discovery from Data (TKDD), 1(1), 3-es.

Mahanan, W., Chaovalitwongse, W. A., & Natwichai, J. (2021). Data privacy preservation algorithm with k-anonymity. World Wide Web, 24, 1551-1561.

Meersman, M.W., 2019. Developing a Cloud Computing Risk Assessment Instrument for Small to Medium Sized Enterprises: A Qualitative Case Study Using a Delphi Technique (Doctoral dissertation, Northcentral University).

Microsoft (2023a) policy position paper EU cyber resilience act proposal. (n.d.). Retrieved March 25, 2023, from https://blogs.microsoft.com//Microsoft-Policy-Paper-Cyber-Resilience-Act-January-2023.pdf

Microsoft (2023b), provided a set of recommendations chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://blogs.microsoft.com/wp-content/uploads/prod/sites/73/2023/02/Microsoft-Policy-Paper-Cyber-Resilience-Act-January-2023.pdf

Murgia, M., & Coulter, M. (2019). Blockbuster GDPR fines proves boost for cyber protection firms. FT.Com

Nauwelaerts, W. (2004). How EU Data Privacy Affects Due Diligence. *Int'l Fin. L. Rev.*, *23*, 41.

NIS 2 Directive (2023). Available at: https://www.nis-2-directive.com/ (Accessed: 26 February 2023).

NIS2 is coming… What does it mean?. (2022). Retrieved 25 March 2023, from https://www.splunk.com/en_us/blog/security/nis2-is-coming-what-does-it-mean.html

Oracle, What is GRPR?. (2023). Retrieved 14 April 2023, from https://www.oracle.com/il-en/security/gdpr/

Paré, G., Trudel, M. C., Jaana, M., & Kitsiou, S. (2015). Synthesizing information systems knowledge: A typology of literature reviews. Information & Management, 52(2), 183-199.

Perdereaux-Weekes, A. (2021). To Investigate the Impact of Data Privacy Regulation on Disclosure Decisions: Examining Consumers' Willingness to Share or Withhold Personal Identifiable Information in the Wake of GDPR, CCPA, and LGDP, St. Thomas University.

Petersen, K., Vakkalanka, S., & Kuzniarz, L. (2015). Guidelines for conducting systematic mapping studies in software engineering: An update. Information and software technology, 64, 1-18.

Phil's Stock World: Google Accused Of Intentionally Breaking EU Data-Privacy Laws; YouTube Pays $170M Fine For US Violations (2019). Newstex

Raghavan, A., Demircioglu, M. A., & Taeihagh, A. (2021). Public health innovation through cloud adoption: a comparative analysis of drivers and barriers in Japan, South Korea, and Singapore. International Journal of Environmental Research and Public Health, 18(1), 334.

Rajamäki, J. (2021). Resilience Management Concept for Railways and Metro Cyber-Physical Systems. Academic Conferences International Limited. https://doi.org/10.34190/EWS.21.074

Regulation (EU) 2022/2554 of the European Parliament and of the Council of 14 December 2022 on digital operational resilience for the financial sector and amending Regulations (EC) No 1060/2009, (EU) No 648/2012, (EU) No 600/2014, (EU) No 909/2014 and (EU) 2016/1011. https://eur-lex.europa.eu/eli/reg/2022/2554/oj

Ross, W. (2018). "EU data privacy laws are likely to create barriers to trade", FT.com,

Schmitz-Berndt, S., & Chiara, P. G. (2022). One step ahead: mapping the Italian and German cybersecurity laws against the proposal for a NIS2 directive. International Cybersecurity Law Review, 3(2), 289-311.

Singh, N., & Singh, A. K. (2018). Data Privacy Protection Mechanisms in Cloud. Data Science and Engineering, 3(1), 24-39. https://doi.org/10.1007/s41019-017-0046-0

Spasic, B., Boucart, N., & Thiran, P. (2019). Security Pattern for Cloud SaaS: From System and Data Security to Privacy Case Study in AWS and Azure. Computers, 8(2), 34. https://doi.org/10.3390/computers8020034

Strengthening EU-Wide Cybersecurity and Resilience - Provisional Agreement by the Council and the European Parliament. (2022, May 14). Targeted News Service

Taylor, C.M., Sr. 2018, Identifying and Overcoming the Barriers to Cloud Adoption within the Government Space, The George Washington University.

Taylor, P. (2011). Privacy concerns slow cloud adoption. FT.Com

The Threat Report: February 2023 | Trellix. (2023). Retrieved 2 April 2023, from https://www.trellix.com/en-us/advanced-research-center/threat-reports/feb-2023.html

Tzanou, M. (2020). "THE FUTURE OF EU DATA PRIVACY LAW: TOWARDS A MORE EGALITARIAN DATA PRIVACY", Journal of International and Comparative Law, vol. 7, no. 2, pp. 449-469.

Venkataramakrishnan, S. (2021). GDPR fines jump as EU regulators raise pressure on business. FT.Com

Thank You!