ALCON
CYBER SECURITY

TO PROTECT DATA, YOU NEED TO CLASSIFY IT

The Essential Guide to Data Classification for Security and Compliance

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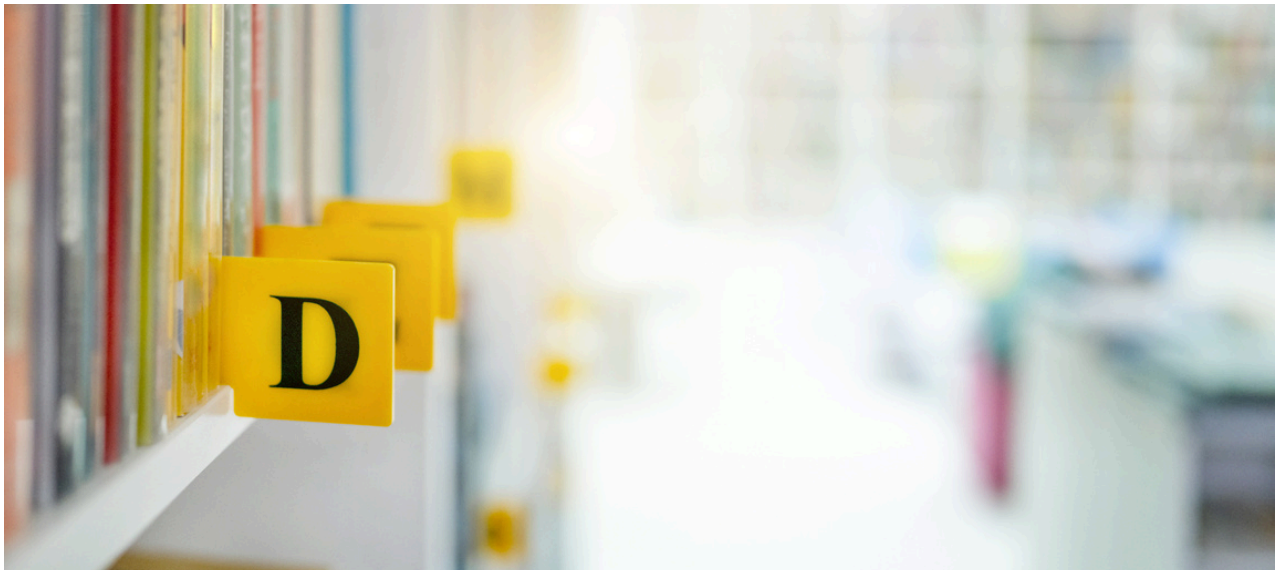

EXECUTIVE SUMMARY

Data breaches, cyberattacks, and regulatory pressures make data protection a top priority for organizations of every size. At the core of effective information security lies data classification—a process that helps organizations identify, organize, and protect sensitive information according to its value and associated risk. Compliance with regulations such as ISO 27001, NIST, PCI DSS, GDPR, HIPAA, and SOC 2 depends on robust data classification practices.

Despite its importance, effective data classification remains a significant challenge. Organizations grapple with discovering data dispersed across diverse systems and locations. Even after discovery, issues such as lack of expertise, insufficient awareness, manual errors, and carelessness can leave sensitive information under-protected. These weaknesses increase the risk of breaches, regulatory fines, and reputational damage. The risks are further amplified by the rise of AI technologies, which may inadvertently process or expose sensitive data if not properly classified.

This whitepaper offers key recommendations to overcome these challenges:

·Prioritizing automated, lifecycle-wide data classification
·Aligning data handling with international standards and regulations
·Regularly reviewing and updating data inventories
·Implementing controls to mitigate emerging risks, such as inappropriate AI training data exposure

Readers will gain a comprehensive understanding of data classification approaches, regulatory requirements, common challenges, modern risks like AI, and practical tools and techniques to safeguard critical information assets and maintain compliance

"Effective data classification is not just a compliance necessity—it is a strategic advantage in managing risk, ensuring privacy, and building stakeholder trust."

THE RISK LANDSCAPE AND THE PROLIFERATION OF SENSITIVE DATA

With the exponential increase in the collection of sensitive data across both public and private sector organizations, managing and protecting this information has become increasingly complex. The rise of advanced technologies, such as large language models (LLMs), has further complicated the risk landscape. When LLMs are trained on organizational data without proper classification, there is a heightened risk of inadvertently processing or exposing sensitive information. Data privacy regulations, such as the GDPR, require organizations to implement strict controls and safeguards for sensitive and personally identifiable information (PII). A breach of these regulations can result in significant financial penalties and reputational damage. As the volume of sensitive data continues to grow, effective classification and labelling are essential for robust risk management and for mitigating security and compliance risks.

DATA CLASSIFICATION POLICY

Organizations irrespective of their size should document and adopt data classification policy. Policy should consist of the following elements

1.Definition and Purpose: Data classification is the process of organizing data into categories based on its sensitivity, value, and criticality to the organization. The main purpose is to ensure appropriate levels of protection and handling. Define the objective of the policy, such as protecting sensitive information and ensuring compliance with legal, regulatory, and contractual obligations. Clearly state which data, systems, users, and business units comes under the scope of policy.

2.Data Classification Levels: Describe the classification categories (typically 3-5 levels), such as:

- Public - Information that can be freely shared.
- Internal - Information restricted to internal use within organization. Internal information may include the employee handbook, various policies and company-wide memos. If disclosed, Internal information has a minimal impact to the business.
- Confidential - Data that's only available to authorized users within the organization. This information may include pricing, business and marketing plans. If disclosed, confidential information could negatively affect business and reputation of organization.
- Restricted/Highly Confidential - Restricted information is highly sensitive and its use should be limited on a need-to-know basis. Restricted information is typically protected with a Non-disclosure Agreement (NDA) to minimize legal risk. Restricted information includes patents, source codes, trade secrets, personally identifiable information (PII), financial information, or health information. If disclosed, there would be a significant financial or legal impact to the business.

3. Criteria for Classification: Classification criteria may include:

- Legal and regulatory requirements (e.g., GDPR, HIPAA).
- Business value and impact.
- Sensitivity and confidentiality.
- Potential damage from unauthorized disclosure, alteration, or destruction.

These criteria help ensure consistent and objective classification decisions.

4. Roles and Responsibilities: Clearly define who is responsible for:

- Classifying data (data owners, custodians)
- Reviewing and updating classifications
- Enforcing classification policies

Clear assignment of roles is essential. Data owners are typically responsible for classifying their data, while data custodians implement and enforce classification controls. Regular reviews and updates to classifications are also assigned to specific individuals or teams to maintain accuracy and compliance.

5. Labelling and Handling

- Methods for labelling data (physical and digital)
- Guidelines for handling, storing, transmitting, and disposing of data based on classification

Once classified, data must be clearly labelled—both physically and digitally—to indicate its classification level. Handling procedures should be established for each level, detailing how data should be stored, transmitted, shared, and disposed of, ensuring that sensitive information is always protected appropriately.

6.Data Handling Requirements: Specify handling, storage, transmission, and disposal requirements for each classification level, covering:

- Access controls - Access to data is restricted based on its classification. Strong authentication, authorization, and auditing mechanisms are implemented to ensure that only authorized personnel can access sensitive information, reducing the risk of data leaks or misuse.
- Data Leakage Protection (DLP)
- Encryption
- Physical security
- Sharing and transfer protocols
- Retention and destruction

7 .Data Lifecycle Management

- Classification should be maintained throughout the data lifecycle: creation, storage, use, sharing, archival, and destruction

This ensures that data remains protected at every stage and that outdated or unnecessary data is securely disposed of.

8.Training and Awareness

- Regular training for employees and vendors on classification policies and procedures
- Awareness programs to reinforce the importance of data protection

Employees and vendors should receive regular training on data classification policies, procedures, and the importance of protecting sensitive information. Awareness programs help reinforce best practices and ensure that everyone understands their role in safeguarding data.

9.Compliance and Monitoring

Ongoing monitoring and regular audits are conducted to verify adherence to classification policies and handling procedures. Compliance checks help identify gaps or weaknesses, enabling continuous improvement of the data protection program

10. Policy Review and Updates

Set a schedule and process for periodic review and updating of the policy to reflect changes in regulations, business needs, or technology.

Standards and Regulatory Crosswalk Matrix: Data Classification Requirements

Aspect	ISO 27001 Clause & Description	NIST SP 800-53 Control & Description	HIPAA Citation & Description	PCI-DSS Requirement & Description	GDPR Article & Description	CCPA Section & Description
Explicit Data Classification Requirement	Clause 5.12, 8.12 Requires organizations to classify information based on value, sensitivity, and criticality, and to handle accordingly.	PL-2, PL-4, RA-2, FIPS 199/200 Mandates categorization of information and systems based on impact (confidentiality, integrity, availability).	45 CFR 164.306(a), 164.308(a)(1)(ii)(A) Requires identification and protection of electronic PHI (ePHI) through risk analysis and management.	Req. 3.1, 3.2, 9.6.1 Requires identification and protection of cardholder data (CHD) and sensitive authentication data (SAD).	Art. 4, 9, 30 Defines personal data and special categories; requires records of processing activities.	§1798.140, §1798.100 Defines personal information and requires businesses to inform consumers about data collection
Classification Levels	Clause 5.12, 8.12 Organizations define their own levels (e.g., Public, Internal, Confidential, Restricted).	FIPS 199, PL-2 Uses Low, Moderate, High impact levels for information and systems.	PHI (no formal levels) Focuses on PHI; no explicit classification levels, but all PHI is protected	CHD, SAD (no formal levels) Focuses on cardholder data and sensitive authentication data	Art. 4(1), 9 Distinguishes between personal data and special categories (sensitive data).	§1798.140(v), (ae) Defines personal information and sensitive personal information.
Scope of Data	Clause 4.4, 8.1 Applies to all information assets within the ISMS scope.	PL-2, PL-4, RA-2 Applies to all federal information and information systems	45 CFR 160.103 Applies to all PHI in any form (electronic, paper, oral).	Req. 3, 9 Applies to all cardholder data environments (CDE).	Art. 3, 4 Applies to personal data of EU residents, regardless of processing location	§1798.140(a) Applies to personal information of California residents.
Basis for Classification	Clause 5.12, 8.12 Based on value, legal/regulatory requirements, business impact, and sensitivity	PL-2, PL-4, RA-2 Based on potential impact to confidentiality, integrity, and availability.	45 CFR 164.306(a) Based on identifiability and sensitivity of health information	Req. 3.2, 9.6.1 Based on risk to cardholder data and payment systems	Art. 4, 9 Based on identifiability, sensitivity, and processing context.	§1798.140(v), (ae) Based on identifiability and sensitivity of consumer data.
Documentation Required	Clause 5.7, 5.12, 8.1, 8.12 Requires documented classification policy, asset inventory, and handling procedures	PL-2, PL-4, RA-2, MP-4 Requires documentation of security categorization, policies, and procedures.	45 CFR 164.316(b) Requires documentation of policies and procedures for PHI protection.	Req. 12.1, 12.3.3 Requires documentation of data flows, policies, and procedures for CHD.	Art. 30 Requires records of processing activities and data inventories.	§1798.100, §1798.130 Requires privacy notices and data inventories for consumer information.
Review/Update Frequency	Clause 5.7, 8.1 Requires periodic review and update of classification and asset inventories	PL-2, PL-4, RA-2 Requires periodic review and update of categorization and documentation	45 CFR 164.308(a)(8) Requires periodic technical and non-technical evaluation of security measures	Req. 12.1.1 Requires annual review of security policies and procedures	Art. 30(1)(g) Requires regular review and update of processing records.	§1798.130(a)(2) Requires annual review and update of privacy policies.
Unique Requirements	Clause 5.12, 8.12 Emphasizes organization-defined classification schemes and handling procedures	FIPS 199/200, PL-2, PL-4 Mandates use of federal standards for categorization and impact assessment	45 CFR 164.502, 164.514 Requires minimum necessary use/disclosure and de-identification of PHI.	Req. 3, 9 Requires strict controls for storage, transmission, and access to cardholder data.	Art. 9, 15, 17 Requires special handling for sensitive data and data subject rights (e.g., erasure).	§1798.120, §1798.125 Requires consumer opt-out rights and special protections for minors
Commonalities	Clause 5.7, 5.12, 8.1 All require identification, documentation, and protection of sensitive data.	PL-2, PL-4, RA-2 All require risk-based approach, documentation, and periodic review.	45 CFR 164.306, 164.308 All require policies, procedures, and risk management for sensitive data.	Req. 3, 9, 12 All require data protection, documentation, and regular review.	Art. 5, 30 All require data minimization, transparency, and accountability	§1798.100, §1798.110 All require consumer rights, transparency, and breach notification.

This matrix in Table 1 displays data classification requirements under ISO27001, NIST SP 800-53, HIPAA, PCI-DSS, GDPR and CCPA. This shows the data classification requirements are integral to the regulatory compliance landscape and protection requirements need to be ensured based on the jurisdiction and sector in which your business is operating.

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Technology, Automation, and Tooling

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Modern data environments are complex. Data flows across cloud platforms, on-premises servers, endpoints, and mobile devices. Manual classification—where users label files or emails themselves—doesn't scale and is prone to error. Technology steps in to bridge this gap.
Today's data classification solutions use a mix of pattern recognition, machine learning, and natural language processing. These technologies scan documents, emails, databases, and even images to identify sensitive information. For example, they can spot credit card numbers, health records, or confidential business plans, even if the data is buried deep in a file or hidden in an email thread.

Automation: Making Classification Work at Scale

Automation is the engine that drives effective data classification. Automated tools can scan millions of files across an organization, flagging or labelling sensitive data without human intervention. This not only saves time but also ensures consistency.
Automated classification can be rule-based, using predefined patterns (like regular expressions for credit card number), or AI-driven, learning from examples to spot less obvious sensitive content. Some systems combine both, using rules for well-known data types and machine learning for context-based decisions. There is a red flag when using AI models. As discussed above, AI models need to access files and documents containing sensitive data and if risks related to AI models are not properly managed these models can itself expose sensitive data. So, risks related to AI models need to factor in while formulating risk management strategies. Also, too much reliance on AI based classification can bring complacency among people managing data classification thus leading to errors in classification. Human oversight is required, and it becomes more important in case of AI models.
Automation also helps with ongoing compliance. As regulations like GDPR, HIPAA, and India's DPDP Act evolve, automated tools can update classification policies to keep up, reducing the risk of non-compliance.

KEY TOOLS AND SOLUTIONS

Key Tools and Solutions

A range of tools now support data classification, each with its strengths. Few of the tools has been enumerated below for reference:

- **Microsoft Purview (formerly Azure Information Protection):** Integrates with Microsoft 365, automatically classifying and labelling documents and emails based on content and context. It supports both manual and automatic classification and can enforce encryption or access controls based on labels.
- **Symantec Data Loss Prevention (DLP):** Uses content inspection and contextual analysis to classify data across endpoints, networks, and cloud services. It can block, quarantine, or encrypt sensitive data based on classification.
- **Varonis Data Classification Engine:** Focuses on unstructured data, scanning file shares and cloud storage for sensitive content. It uses built-in patterns and customizable rules to classify data and trigger alerts or remediation.
- **BigID:** Uses advanced discovery and classification techniques, including machine learning, to map and label personal and sensitive data across structured and unstructured sources. It's especially strong for privacy compliance.
- **Open-source tools:** Projects like Apache Tika and DLPy (for Python) offer building blocks for custom classification solutions, letting organizations tailor classification to their unique needs.

Privacy Protection and Security Benifits

Accurate data classification is the foundation for strong privacy and security controls. Once data is classified, organizations can apply the right protections—encryption, access restrictions, or monitoring—based on sensitivity. This reduces the risk of data breaches and helps meet regulatory requirements.

Automated classification also supports incident response. If a breach occurs, knowing exactly what kind of data was exposed, speeds up containment and notification, and limits reputational damage.

Looking Ahead

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As data volumes grow and privacy regulations tighten, technology, automation, and tooling for data classification will only become more important. The best solutions will blend AI, automation, and user-friendly interfaces, making it easier for organizations to protect their most valuable information—without slowing down business.

Challenges and Solutions

Data Localization and Cross-Border Transfer Challenges (GDPR and sectoral regulations)

Data classification helps organizations comply with laws that restrict where certain types of data can be stored or processed. For example, under the GDPR, personal data of EU citizens must not be transferred to countries without adequate data protection. If an organization classifies customer records as “EU Personal Data,” it can automatically block those records from being uploaded to cloud services hosted outside the EU. Similarly, in India, the RBI mandates that payment data be stored only within the country. By classifying payment transaction logs as “Payment Data – India,” organizations can ensure these records are not inadvertently transferred to global data centres.

Handling Legacy and Unstructured Data

Legacy databases and unstructured data (like scanned contracts, emails, or chat logs) often contain sensitive information that is not properly identified or protected. For example, a company may have old HR files stored on a shared drive, some of which contain social security numbers or medical information. By using data classification tools that scan and tag these files as “PII” (Personally Identifiable Information) or “Sensitive Health Data,” the organization can apply encryption, restrict access, or schedule secure deletion. Another example: classifying unstructured email attachments containing customer credit card numbers as “PCI Data” to ensure they are not stored in non-compliant systems.

Addressing “Shadow IT” and Data Sprawl

Employees may use unauthorized apps like personal cloud storage accounts or instant messaging tools such as WhatsApp to share work files, leading to data sprawl. If a sensitive engineering design document is classified as “Confidential IP,” automated data loss prevention (DLP) tools can detect and block attempts to upload it to unapproved cloud services. Similarly, if a spreadsheet containing employee salaries is classified as “Internal Use Only,” the system can alert IT if it is emailed outside the company domain. This helps prevent sensitive data from leaking into uncontrolled environments.

User Adoption and Resistance

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Users may resist data classification if it disrupts their workflow. For example, if employees are required to manually tag every document they create, they may skip or misclassify files. To address this, organizations can use automated classification tools that analyze document content and suggest or apply appropriate labels. For instance, if a user creates a document containing the phrase “confidential merger discussions,” the system can automatically classify it as “Highly Confidential.” Providing clear guidelines and integrating classification into familiar tools like Microsoft Office or Google Workspace also helps increase adoption.

Keeping Up with Regulatory Change (Data privacy, HIPAA Updates, Sector-Specific Regulations)

Regulations change frequently, requiring organizations to update their data classification policies. For example, after the Schrems II ruling, companies had to reassess how they classified and transferred EU personal data to US-based cloud providers. In healthcare, if HIPAA expands the definition of protected health information (PHI), organizations must update their classification rules to include new data types, such as genetic information. In the financial sector, new regulations may require classifying transaction data as “AML Sensitive” (Anti-Money Laundering) and applying stricter controls. Automated classification systems that can be updated centrally help organizations stay compliant as rules evolve.

Conclusion: The Strategic Imperative of Data Classification

In today's rapidly evolving digital landscape, data classification stands as a cornerstone of effective information security and regulatory compliance. As organizations face mounting threats from cyberattacks, data breaches, and increasingly complex regulatory requirements, the ability to accurately identify, categorize, and protect sensitive information is no longer optional—it is essential. The proliferation of sensitive data, the rise of advanced technologies like AI, and the challenges of data sprawl and cross-border transfers have made robust data classification both more difficult and more critical than ever.

A well-defined data classification policy, supported by automation and modern tooling, empowers organizations to manage risk proactively, ensure privacy, and maintain stakeholder trust. Automated solutions not only enhance accuracy and scalability but also help organizations adapt swiftly to regulatory changes and emerging threats. However, technology alone is not enough; human oversight, regular training, and a culture of data protection are vital to address gaps and prevent complacency.

Ultimately, effective data classification delivers far-reaching benefits: it streamlines compliance, strengthens security, and provides a strategic advantage in managing information assets. By embracing a lifecycle-wide, standards-aligned, and technology-enabled approach to data classification, organizations can safeguard their most valuable data, minimize risk, and confidently navigate the complexities of the modern regulatory environment.

THANK YOU

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