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Cyber security and Data Protection in Commerce: The Role of Governance, Ethics, and Regulation

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Abstract:

The growth of e-commerce, digital payments, cloud computing, artificial intelligence, and data-driven marketing has made information one of the most valuable assets in modern business. At the same time, organizations are dealing with growing threats such as ransomware, phishing, insider attacks, identity theft, supply-chain compromises, and unauthorized use of personal data. Cyber security and data protection are therefore much more than technical concerns. They are closely tied to corporate governance, business ethics, consumer trust, and regulatory compliance. This paper examines how these areas are connected in the commercial sector. It looks at how governance creates accountability, how ethical principles shape responsible data use, and how regulations establish minimum expectations for privacy and security. The study uses a qualitative, secondary-research approach based on academic literature, international standards, and legal frameworks. It argues that organizations need a risk-based, human-centred approach that combines board oversight, privacy by design, employee awareness, transparent data practices, incident preparedness, and ongoing compliance monitoring. Strong cyber security and responsible data governance can ultimately become a competitive advantage by protecting stakeholders, improving resilience, and strengthening trust in digital commerce.

Keywords: Cybersecurity, Data Protection, E-commerce, Corporate Governance, Business Ethics, Privacy, Regulation, ESG



Introduction:

Digital transformation has reshaped the way commerce operates. Businesses now collect and process large amounts of personal, financial, behavioral, and operational information through websites, mobile apps, payment platforms, customer-relationship systems, social-media platforms, cloud services, and artificial intelligence tools. This information supports activities such as personalization, fraud detection, logistics planning, credit assessment, and strategic decision-making. *(OECD, 2024)*

The value of this data also brings serious risks. A successful cyber-attack can interrupt operations, expose customer information, create legal liability, damage an organization's reputation, and weaken consumer confidence. Data breaches can cause wider social harm as well, including financial fraud, identity theft,

discrimination, and loss of individual autonomy. *(Verizon, 2025)*

Traditionally, cybersecurity has focused on protecting information systems against unauthorized access, disruption, alteration, and destruction. Data protection takes a wider view by asking how personal information is collected, used, shared, stored, and deleted. Therefore, an organization may have technically secure systems and still handle personal data unfairly or excessively. Responsible commerce requires sound information security and lawful and ethical data governance. *(European Commission, n.d.; Government of India, 2023)*

The National Institute of Standards and Technology's Cybersecurity Framework 2.0 treats cybersecurity as an enterprise-level risk and places greater emphasis on governance and informed leadership. Modern data protection frameworks similarly stress transparency, purpose limitation, data minimization, integrity, confidentiality, and accountability. Together, these developments show why cybersecurity and privacy need to be part of business strategy rather than being treated as isolated IT responsibilities. *(Pascoe et al., 2024; European Commission, n.d.)*

Problem Statement:

Many commercial organizations collect more personal information than they actually need and operate within complicated digital ecosystems involving third-party vendors, payment processors, cloud providers, and analytics platforms. Weak governance, limited employee awareness, poor data practices, and fragmented regulatory requirements can all increase the likelihood and impact of cyber incidents. *(Pascoe et al., 2024; Verizon, 2025)*

The central problem addressed in this paper is:

How can commercial organizations integrate governance, ethics, and regulations to improve cybersecurity and protect personal data?

Objectives of the Study:

The objectives of this research are:

1. To examine the importance of cybersecurity and data protection in modern commerce,
2. To analyze the role of corporate governance in managing cyber and privacy risks
3. To explain the ethical responsibilities of organizations that collect and process personal data.
4. To study the contribution of regulatory frameworks to responsible digital commerce.
5. To propose an integrated framework for improving cybersecurity and data protection practices.

Research Questions:

1. Why are cybersecurity and data protection important for commercial organizations?
2. How does governance influence an organization's cybersecurity performance?
3. Which ethical principles should guide the collection and use of customer data?
4. How do regulations encourage accountability and responsible data processing?
5. What integrated practices can strengthen cyber resilience and consumer trust?

Literature Review:

1. Cybersecurity in Commercial Organizations: Cybersecurity includes policies, technologies, processes, and human practices used to protect digital systems, networks, applications, and information. In a commercial setting, this protection extends to customer accounts, payment details, intellectual property, employee records, supplier information, and daily business operations. *(Pascoe et al., 2024)* The main objectives of cybersecurity are commonly represented by the CIA triad:

- Confidentiality: It means protecting information from unauthorized access only authorized users should be able to view sensitive data.
- Integrity: It ensures that data remains accurate, complete and unchanged unless by an authorized person. Information should remain accurate and complete and should not be changed without authorization.
- Availability: It ensure that information and computer system are accessible whenever authorized users need them .Systems and data

should be accessible to authorized users when needed.

Commercial organizations must also consider authenticity, accountability, resilience, and non-repudiation. For example, an online retailer must keep a customer's payment information confidential, ensure that order details are not changed without authorization, and keep its platform available when demand is high.

The NIST Cybersecurity Framework 2.0 provides high-level cybersecurity outcomes that organizations of different sizes and sectors can use to assess, prioritize, and communicate their security efforts to stakeholders. Its focus on governance is particularly useful in commerce because cyber risks can affect finances, operations, legal compliance, customer relationships, and reputation. *(Pascoe et al., 2024)*

2. Data Protection and Privacy: Data protection is concerned with the responsible handling of information about identifiable individuals. Personal data can include names, addresses, telephone numbers, email addresses, financial details, location information, online identifiers, purchase histories, and inferred preferences. *(European Commission, n.d.)* The European Commission identifies seven key data-processing principles: *(European Commission, n.d.)*

- **Lawfulness, Fairness & Transparency:** Personal data must be collected and used legally, fairly, and clearly explained to people.
- **Purpose Limitation:** Data should be collected only for a specific and clearly defined purpose.
- **Data Minimization:** Collect only the data that is necessary for the intended purpose.
- **Accuracy:** Personal data should be correct, complete, and updated when necessary.
- **Storage Limitation:** Do not keep personal data for longer than necessary.
- **Integrity & Confidentiality:** Protect personal data from unauthorized access, loss, damage, or misuse.
- **Accountability:** Organizations must take responsibility for following data-protection rules and be able to prove it.

These principles provide a useful foundation for commercial organizations, even where a particular business is not directly subject to the GDPR. *(European Commission, n.d.)*

Data protection is about more than preventing breaches. Organizations also need to ask: *(European Commission, n.d.; OECD, 2024)*

1. Was the data collected for legitimate and clearly stated purposes?
2. Was the individual properly informed of the study?
3. Was only the information that was actually needed collected.
4. Was the consent meaningful and freely given?
5. Was the information shared with third parties responsibly?
6. Was the information retained longer than necessary?
7. Could automated processing unfairly disadvantage individuals?

3. Governance and Cybersecurity: Corporate governance covers the systems through which an organization is directed, controlled and held accountable. Good cybersecurity governance makes senior leadership responsible for cyber risks and ensures that security considerations are included in business planning. *(Harel & Carmeli, 2025; Lowry et al., 2025)*

A governance model should include the following:

- Board-level oversight of cybersecurity and privacy
- Clearly defined responsibilities for executives, IT teams, legal departments, and business units.
- A formal cybersecurity and data protection policy.
- Risk assessment and reporting.
- Vendor and supply-chain oversight
- Incident response and business continuity planning.
- Internal audits and compliance reviews are also conducted.

- Adequate investment in people, processes, and technology is required.

Governance is important because cybersecurity failures often result from organizational weaknesses rather than technical problems. Common examples include insufficient budgets, unclear ownership, delayed software updates, poor access management, weak vendor controls, and failure to report suspicious activity. *(Harel & Carmeli, 2025; Lowry et al., 2025)*

4. Ethics and Responsible Data Use: Business ethics help organizations decide what they should do, including situations where a particular practice is not explicitly prohibited by law. Ethical data governance requires organizations to respect individual dignity, autonomy, fairness, and data security. *(OECD, 2024)*

Something can be legally permitted and still ethically questionable. For example, a company might use complicated privacy notices to obtain broad consent, encourage customers to share more information than necessary, or use algorithmic profiling without explaining what the results could mean for the individuals. *(OECD, 2024)*

Important ethical principles include the following:

- Respect for autonomy: Individuals should understand and have meaningful control over how their data are used.
- Fairness: Data practices and algorithms should not result in unjust discrimination.
- Transparency: Organizations should explain important decisions involving personal data in language that people can understand.
- Accountability: A responsible person or institution should be answerable for data practices.
- Non-maleficence: Organizations should take reasonable steps to avoid causing foreseeable harm.
- Beneficence: Data use should provide legitimate value to customers and society.
- Confidentiality: Sensitive information should be protected from unauthorized disclosure.

5. Regulation and Compliance: Regulations set enforceable expectations for privacy, security, breach management, consumer rights, and organizational accountability. It also provides remedies and penalties when organizations fail to protect the personal information of their employees.

India's Digital Personal Data Protection Act, 2023 was enacted to regulate the processing of digital personal data while recognizing both individuals' interest in protecting their data and organizations' need to process information for lawful purposes. Therefore, the Act is highly relevant to Indian e-commerce, banking, telecommunications, healthcare, education, and digital-platform businesses. *(Government of India, 2023)*

The GDPR is another influential framework. It applies to organizations established in the European Union and, in certain circumstances, to organizations outside the EU that offer goods or services to people in the EU or monitor their behavior. Its emphasis on accountability and data protection by design encourages organizations to consider privacy from the beginning of a product or service lifecycle, rather than only after a problem has occurred. *(European Commission, n.d.)*

Regulation is important, but compliance by itself is not sufficient. A company can meet formal requirements and still have a weak security culture or confusing privacy practices. Effective organizations use regulation as a minimum baseline and build on it through ethical responsibility and continuous risk management. *(Government of India, 2023; European Commission, n.d.)*

Research Methodology:

1. Research Design: This study used a qualitative and descriptive research design. It examines the relationships between cybersecurity, data protection, governance, ethics, and regulation in commerce.

2. Data Sources: This study is based on secondary data collected from:

- Government legislation and regulatory documents are also included
- Cybersecurity standards and frameworks
- Reports from recognized public institutions

- ❖ Academic books and journal articles.
- ❖ Official organizational and regulatory websites
- ❖ Scholarly discussions on privacy, digital ethics, and corporate governance

The NIST Cybersecurity Framework 2.0, GDPR principles, and India's Digital Personal Data Protection Act, 2023 were treated as important reference points for the study. *(Pascoe et al., 2024; European Commission, n.d.; Government of India, 2023)*

The study also uses the 2025 Verizon Data Breach Investigations Report for current threat evidence, recent peer-reviewed research on board-level cybersecurity oversight (Harel & Carmeli, 2025; Lowry et al., 2025), and OECD work on AI, data governance, privacy, fairness, and accountability (OECD, 2024).

3. Data-Analysis Method: The collected material was reviewed thematically, with the analysis centered on four areas.

- ✓ Cybersecurity risks in commerce
- ✓ Governance and organizational accountability.
- ✓ Ethical data collection and processing were performed.
- ✓ Legal and regulatory responsibilities

4. Scope of the Study: This paper focuses on commercial organizations that process digital data, including

- ◆ E-commerce companies.
- ◆ Digital payment providers.
- ◆ Banks and financial-technology firms
- ◆ Retail companies.
- ◆ Cloud-based businesses.
- ◆ Online platforms and marketplaces.
- ◆ Organizations using artificial intelligence for business decisions

Cybersecurity Risks in Commerce:

1. Phishing and Social Engineering: Phishing attacks attempt to persuade employees or customers to reveal passwords, authentication codes, or financial information. Social engineering can be particularly effective because it exploits human behavior rather than relying only on technical weaknesses. *(Verizon, 2025)*

2. Ransomware: Ransomware can encrypt an organization's files or disrupt critical systems and then demand payment. In a commercial environment, an attack can halt order processing, logistics, payment services, customer support, and manufacturing operations. *(Verizon, 2025)*

3. Payment Fraud: Digital commerce creates opportunities for payment card fraud, account takeovers, fake transactions, identity theft, and unauthorized refunds. Measures such as multi-factor authentication, transaction monitoring, encryption, and fraud analytics can help to reduce these risks.

4. Insider Threats: Employees, contractors, and business partners can deliberately or accidentally expose confidential information. Least-privilege access, employee training, monitoring, and clear disciplinary procedures are crucial safeguards. *(Verizon, 2025)*

5. Third-Party and Supply-Chain Risk: Commercial organizations frequently share information with vendors, logistics providers, advertising platforms, payment processors and cloud service providers. Because these systems are interconnected, a weakness in one supplier can affect many businesses. *(Verizon, 2025)*

6. Artificial Intelligence and Automated Decision-Making: AI can improve fraud detection and personalization, but its use can also introduce privacy and fairness concerns. Poor-quality or excessive data may lead to inaccurate decisions, discriminatory outcomes, or opaque profiling. Organizations must therefore consider both cybersecurity risks and ethical consequences when deploying AI. *(OECD, 2024)*

Role of Governance:

1. Board and Senior-Management Responsibility: Cybersecurity needs to be treated as a strategic business risk at the board and executive levels. Senior leaders should receive clear reports on critical assets, major vulnerabilities, incident trends, third-party exposure, and the organization's ability to recover. *(Harel & Carmeli, 2025; Lowry et al., 2025)*

The NIST CSF 2.0 specifically highlights governance as the process through which organizations establish and monitor cybersecurity strategies, expectations, and policies. This places cybersecurity alongside financial, operational, and reputational risk. *(Pascoe et al., 2024)*

2. Accountability Structures: Organizations should designate responsible officers and committees for cybersecurity and privacy. Their responsibilities should be documented through policies, reporting lines, escalation procedures and measurable performance indicators. *(Lowry et al., 2025)*

Useful governance indicators include the following:

- Time taken to detect and contain an incident.
- Percentage of systems covered by multi-factor authentication
- Completion rate of employee security training
- Number of unresolved critical vulnerabilities.
- Percentage of vendors assessed for cybersecurity risks.
- Number of privacy complaints and time taken to respond.
- Frequency of backup testing and incident simulations

3. Risk-Based Decision-Making: Governance should focus on risks according to their likelihood and potential impact. The same controls are not necessary for every system. A database containing payment or health information, for example, requires stronger protection than a public marketing webpage. *(Pascoe et al., 2024)*

A risk-based approach generally involves the following:

- Identifying critical data and systems
- Evaluating threats and vulnerabilities
- Estimating the possible impact on the business and its stakeholders
- Selecting appropriate safeguards
- Monitoring changes and reassessing risks.

4. Data Governance: Data governance sets the rules for data ownership, classification, access, quality, retention, sharing, and deletion. It helps organizations answer practical questions such as

1. Who owns the data?
2. Why is it being collected?
3. Who is allowed to access this?
4. How long should it be retained for?
5. Where is it stored?
6. When should it be deleted?
7. How will the organization respond to an individual's request?

Ethical Responsibilities:

1. Transparency and Meaningful Consent: Privacy notices should use clear language and explain why information is collected, what categories of data are involved, how it may be shared, how long it will be retained, and what rights the individuals have. Consent should not be buried in lengthy terms and conditions or obtained through a manipulative interface design. *(European Commission, n.d.; OECD, 2024)*

2. Data Minimization: Organizations should collect only the information needed for specific and legitimate purposes. Holding excessive data increases the potential impact of a breach and creates additional obligations regarding storage, accuracy, security, and deletion. *(European Commission, n.d.)*

3. Fairness and Non-Discrimination: Businesses that use algorithms for credit, employment, pricing, fraud detection, or customer profiling should check whether their systems disadvantage particular groups of people. Ethical oversight includes testing the data quality, monitoring outcomes, documenting decisions, and providing an appeal or review mechanism where appropriate. *(OECD, 2024)*

4. Privacy by Design: Privacy and security should be considered when planning products and services, not only after development is complete. Examples include: *(European Commission, n.d.; OECD, 2024)*

- ✓ Default privacy-friendly settings must be established.
- ✓ Encryption of sensitive information is also a concern.
- ✓ Pseudonymization is used where appropriate.
- ✓ Limited employee access.
- ✓ Secure application development.
- ✓ Automatic deletion after retention period.

The GDPR describes data protection by design as implementing technical and organizational measures at the earliest stages of processing operations. *(European Commission, n.d.)*

5. Responsible Disclosure: When a vulnerability is identified, organizations should have a clear process for receiving, evaluating, and resolving the reports. Responsible disclosure helps to limit harm and encourages cooperation among businesses, security researchers, and customers.

Role of Regulation:

1. Establishing Minimum Standards: Regulation provides a baseline for responsible data processing and security. It encourages organizations to implement safeguards, maintain records, respond to incidents, and respect individual rights. *(Government of India, 2023; European Commission, n.d.)*

2. Strengthening Accountability: Modern data-protection frameworks increasingly expect organizations to demonstrate compliance rather than simply stating that they respect privacy. This can involve policies, impact assessments, contracts, audits, employee training, and supporting documentation. *(European Commission, n.d.; Government of India, 2023)*

3. Protecting Consumer Rights: Data-protection regulations generally aim to give individuals greater control over their personal information. Depending on the framework, this can include the right to receive information about processing, correct inaccurate data, withdraw consent, request deletion in relevant circumstances, and use complaint or remedy mechanisms. *(European Commission, n.d.; Government of India, 2023)*

4. Supporting Trust in Digital Commerce: Clear regulatory expectations can make consumers more comfortable using digital services. Trust becomes especially important when transactions involve financial information, identity verification, behavioral profiling, and cross-border data transfers. *(European Commission, n.d.)*

5. Challenges of Regulatory Compliance: Organizations may face several practical compliance challenges. *(Government of India, 2023; European Commission, n.d.)*

- ✧ Differences among national privacy laws
- ✧ Ambiguous requirements for emerging technologies
- ✧ Difficulties in managing third-party processors
- ✧ High compliance costs for small businesses
- ✧ Rapid changes in cyber threats
- ✧ Tension between data-driven innovation and data minimization
- ✧ Difficulty translating legal requirements into practical technical controls

Integrated Framework for Commercial Organizations:

An effective cybersecurity and data-protection program must integrate governance, ethics, technology, and regulation.

Dimension	Key Practices	Expected Outcome
Governance	Board oversight, clear accountability, risk reporting, internal audits	Responsible decision-making
Technology	Encryption, multi-factor authentication, secure development, backups	Confidentiality, integrity, and availability
Data management	Data inventory, classification, minimization, retention controls	Reduced privacy and breach risk
Ethics	Transparency, fairness, consent, human review, non-discrimination	Respect for customers and stakeholders
Regulation	Legal mapping, impact assessments, contracts, documentation	Compliance and accountability
People	Awareness training, reporting culture, role-based access	Reduced human error
Incident response	Detection, containment, communication, recovery, lessons learned	Organizational resilience
Third parties	Vendor due diligence, security clauses, continuous monitoring	Reduced supply-chain exposure

This framework should be treated as an ongoing program rather than a one-time compliance exercise. Organizations need to regularly test controls, review new technologies, update policies, and learn from incidents.

Findings and Discussion:

This study identified five major findings.

Finding 1: Cybersecurity Is a Governance Issu: Cybersecurity decisions influence business continuity, financial performance, customer trust, and legal exposure. Therefore, responsibility should not sit entirely with technical teams. Senior leadership needs to set priorities, provide resources, and monitor results.

Finding 2: Data Protection Is Broader Than Security: Security protects information from unauthorized access and damage. Data protection goes further by considering whether information is collected and processed in a lawful, fair, necessary, and transparent manner. A system can be technically secure while still enabling unethical profiling or excessive data collection.

Finding 3: Ethics Complements Regulation: Law sets minimum obligations, but ethical principles help guide decisions when regulations do not provide clear answers. Ethical organizations consider possible harm, individual autonomy, fairness, and wider social consequences.

Finding 4: Third-Party Risk Requires Greater Attention: Commercial organizations rely on interconnected suppliers and platforms, making third-party risks particularly important. Vendor contracts, security assessments, access controls, and incident notification requirements are essential for protecting shared information.

Finding 5: Trust Is a Strategic Asset: Consumers are more likely to use digital services when they believe that an organization will protect their information and handle it responsibly. Therefore, cybersecurity and privacy can strengthen brand reputation and contribute to a long-term competitive advantage.

Recommendations:

Commercial organizations should consider the following measures:

- Establish board-level cybersecurity and data protection oversight mechanisms.
- Maintain an up-to-date inventory of personal data, systems, applications and third parties.
- Use multi-factor authentication and least-privilege access for sensitive systems.
- Encrypt sensitive information during storage and transmission of data.
- Secure software development and vulnerability management practices should be implemented.
- Conduct privacy impact and cybersecurity risk assessments before launching new products.
- Only necessary data should be collected, and clear retention and deletion periods should be defined.
- Provide transparent privacy notices and meaningful choices for customers.
- Audit algorithms for bias, accuracy, explainability and discriminatory outcomes.
- Train employees regularly through practical simulations and phishing awareness exercises.
- Establish incident-response plans and test them through tabletop exercises.
- Assess vendors before onboarding and monitor them throughout the relationship.
- Maintain records that demonstrate compliance with the applicable regulations.
- A clear process for receiving complaints and responding to data subject requests should be established.
- Encourage responsible vulnerability disclosure by security researchers

Limitations of the Study:

This paper relies mainly on secondary research and conceptual analysis. It does not include original survey data or statistical testing. The legal environment surrounding digital data can also change over time, so organizations should consult current official notifications and

professional legal advice before making compliance decisions. The study addresses commerce in general and does not provide a sector-specific analysis of banking, healthcare, telecommunications, or government services.

Future Scope:

Future research could examine cybersecurity practices in Indian e-commerce companies using primary survey data. Other useful areas of study include the relationship between privacy investment and customer loyalty, the effectiveness of AI-based fraud detection, cybersecurity readiness among small businesses, and the role of ESG reporting in cyber-risk disclosure.

Further research could also compare how India's data-protection framework is implemented against the GDPR and other international privacy regimes. Detailed case studies of data breaches could help identify recurring governance weaknesses as well as strategies that support effective recovery.

Conclusion:

Cybersecurity and data protection are central to the sustainability and credibility of modern commerce. Digital businesses cannot depend only on firewalls, antivirus software, or legal documents. They need an integrated approach that brings together governance, ethical responsibility, technical controls, employee awareness, and regulatory compliance. *(Pascoe et al., 2024; European Commission, n.d.; Government of India, 2023)*

Effective governance makes sure cybersecurity receives appropriate leadership attention and resources. Ethical principles help ensure that personal data is handled fairly, transparently, proportionately, and with respect for human autonomy. Regulation creates enforceable obligations and strengthens accountability. When these elements work together, organizations can reduce cyber risk, protect stakeholders, become more resilient, and build lasting trust in digital commerce.

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