UNIVERSITY OF SURREY

Information Security for Business and Government
COMM050
Coursework 2 (Individual)

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1.Introduction:

1.1. Overview:

Dynamic and reliable risk assessment procedures are essential in the ever-changing digital world. Following a data breach in 2017 that exposed the personal information of over 147 million people, Equifax, a well-known credit reporting organization, is facing serious difficulties. In addition to exposing weaknesses in Equifax's systems, this incident sparked worries about legal ramifications, regulatory compliance, and public trust.

The adoption of new technology features within a company in reaction to past weaknesses made public by big data breaches, such as the Equifax incident, is the subject of this research. It assesses suggested improvements meant to strengthen system security and improve customer service by utilizing cutting-edge technological solutions. In order to make sure that the company not only complies with present security regulations but is also prepared to face emerging cybersecurity threats, the document harmonizes suggested enhancements with thorough risk assessments, compliance specifications, and control mechanisms.

1.2. Objective:

This report's main goal is to offer an organized and comprehensive plan for adding new features to the business's systems while guaranteeing strong security and adherence to relevant regulations. By implementing cutting-edge technology and taking a risk-driven, comprehensive approach to asset protection, the goal is to improve customer interactions and operational efficiency without sacrificing security. By describing possible hazards, relevant standards, and strategic control implementations required for a safe and efficient integration of new system capabilities, the paper aims to direct high-level decision-making.

2. Inference learned from CW1:

Critical insights on risk management and security tactics for sensitive data at Equifax were given by Coursework 1. Identifying vital assets that are necessary for business continuity and compliance, evaluating risks and vulnerabilities unique to each asset, and putting in place a methodical risk assessment and prioritization process were among the most important lessons learned. A robust security posture that adjusts to changing threats and is in line with business objectives was highlighted by the integration of administrative, technical, and physical safeguards. Prioritizing adherence to rules such as GDPR and PCI-DSS underscores the need to synchronize security protocols with legal mandates in order to foster confidence and avert sanctions. In order to prepare for real-life security concerns, academic learning and professional practice can be bridged through the use of theoretical standards such as ISO/IEC 27005 in practical circumstances.

3. Comparison with the NIST Approach:

Overview of Methodologies:

Information security risk management calls for approaches that can adjust to the changing cybersecurity environment in addition to addressing present threats. An overview of the risk management frameworks is given in this section:

- NIST SP800-30r1 and SP800-39 Frameworks: A more dynamic approach to risk management is presented by these frameworks. Risk assessments are a crucial part of an organization-wide risk management process, and NIST SP800-30r1 offers standards for doing them. It places a strong emphasis on an ongoing cycle of observation and evaluation that adjusts to fresh risks and shifting organizational priorities. By incorporating risk management into the governance structure and extending its application to information security risk management across the entire business, NIST SP800-39 guarantees that risk management meets both operational and strategic objectives.

NIST SP800-30r1 and SP800-39 Frameworks: Enhanced Asset Identification

A method to asset identification that is thorough and essential for efficient risk management is offered by the NIST SP800-30r1 and SP800-39 frameworks. These standards place a strong emphasis on the relationships that assets have with external systems, as well as their roles in larger organizational processes and operational significance. By including interdependency, compliance, and strategic considerations, this strategy greatly expands upon the conventional asset identification approach.

Comprehensive Environmental Context: NIST frameworks support evaluating assets in their operational contexts, which broadens the scope of risk management. For example, "**Financial Information**" and "**Personal Information of Customers**" are assessed not only for their own merits but also for how they relate to and influence other business processes and legal obligations.

Systemic Risk Considerations: NIST highlights the importance of asset interconnection and challenges businesses to think about the ripple effects of asset compromise. For instance, a flaw in the "**Equifax Identity Verifier (EIV) Source Code**" can allow for illegal access to a number of connected systems, greatly increasing the possible impact of the breach even beyond the initial penetration.

Adaptive Risk Identification: NIST's dynamic model supports continual adaptation and reassessment of assets as external and internal conditions change. To handle new vulnerabilities and threat vectors as they emerge, assets like **"web servers" and "database servers"** require continuous assessment.

Regulatory Compliance and Governance: Sensitive assets such as **"EIV Dataset A (USA)" and "EIV Dataset B (UK)"** are examined for compliance with GDPR and other data protection standards in addition to their security postures. This ensures that asset management techniques comply with all applicable laws.

By employing the NIST SP800-30r1 and SP800-39 frameworks for asset identification, companies such as Equifax can enhance their risk management strategy's resilience.

NIST SP800-30r1 and SP800-39 Frameworks: Comprehensive Threat and Vulnerability Assessment

Comprehensive Threat Identification: ST frameworks have a strong emphasis on comprehensive threat identification. They evaluate a range of potential sources, such as "**Remote Spying**" that target **"Customer Personal Information,"** from both internal and external actors in order to understand the many causes and implications of risk.

Holistic Vulnerability Assessment: NIST emphasises evaluating vulnerabilities in a comprehensive manner that takes into account interconnected systems and goes beyond a single asset. An example of this would be a vulnerability in the **"Apache Struts 2 Web App Framework"** that might impact the **"GCS Website,"** leading to significant disruptions in operations.

Integrated Risk Modeling: Threat, vulnerability, and risk management assessments are integrated by IST, providing a holistic perspective. In the case of assets such as **"EIV Dataset A (USA**)" and **"EIV Dataset B (UK),"**this entails evaluating risks based on data sensitivity, compliance, and business impact.

Enhanced Detection and Response Capabilities: Strong detection and response techniques are emphasized in NIST frameworks for threat assessments. For example, sophisticated monitoring of **"Authentication Data"** and **"Customer Passwords"** helps identify unwanted access attempts early and allows for quick remediation.

NIST SP800-30r1 and SP800-39 Frameworks: Comprehensive Risk Assessment

Integrated Risk Management: NIST SP800-39 provides a comprehensive perspective on risk assessment by extending its scope beyond individual assets to the organizational context. Technical, operational, managerial, and strategic ramifications are taken into account. For instance, analyzing the **"Equifax EIV Source Code"** for risk entails determining how it may affect operations, competitiveness, and legal compliance.

Systematic Risk Identification: NIST SP800-30r1 is followed in the risk assessment process, which starts with a detailed identification of threats and vulnerabilities affecting assets including **"Customer Personal Information"** and **"Financial Data."** In order to set the stage for further analysis, this entails evaluating potential threat sources and events for negative effects.

Risk Prioritization: Risk assessments are prioritized in accordance with NIST SP800-39, taking into account the influence on goals and control efficacy. Focus is placed on risks that could result in serious breaches or compliance problems for assets like **"Backup"** and **"Authentication Data,"** allocating resources to minimize the biggest risks.

Dynamic Risk Monitoring and Review: In order to adjust to operational changes and emerging threats, both frameworks place a strong emphasis on ongoing risk environment monitoring and review. This guarantees the continued applicability of risk evaluations for resources such as the **"GCS Website,"** allowing Equifax to promptly modify risk management tactics as required.

Equifax can maintain a proactive and well-informed approach to risk management by implementing the risk assessment methodologies described in NIST SP800-30r1 and SP800-39.

NIST SP800-30r1 and SP800-39 Frameworks: Robust Risk Mitigation Strategies

Comprehensive Control Selection: NIST frameworks emphasize the importance of evaluating risk mitigation controls thoroughly and stress their efficacy in lowering identified risks. To protect sensitive data from unauthorized access and breaches, this entails putting encryption, access controls, and continuous monitoring in place for assets like **"Credit Card Numbers"** and **"Customer Personal Information."**

Alignment with Organizational Goals: The alignment of risk mitigation with the objectives and risk appetite of an organization is emphasized in SP800-39. This guarantees that investments in assets such as **"Financial Information"** not only lower risk but also help achieve strategic objectives like financial compliance and consumer trust.

Strategic Implementation and Monitoring: Both frameworks place emphasis on the strategic implementation of risk reduction through the integration of controls into current systems and processes. For instance, implementing secure coding practices, carrying out frequent security evaluations, and creating strong user authentication may all be necessary to secure the **"GCS Website".**

Continuous Improvement and Adaptation: NIST SP800-39 emphasizes that risk mitigation techniques must be continuously improved in order to meet evolving business requirements and threats. Regularly updating encryption, assessing access, and enhancing monitoring are required for assets such as **"Backup"** and **"Authentication Data."**

Organizations like Equifax can successfully decrease their exposure to security risks, assuring the protection of vital assets and supporting the fulfilment of business objectives, by implementing the risk mitigation measures provided in NIST SP800-30r1 and SP800-39.

Conclusion:

Enhancing the security and resilience of an organization's operations may be tremendously beneficial for Equifax, provided that its risk management procedures incorporate the NIST SP800-30r1 and SP800-39 frameworks. These frameworks provide a comprehensive, flexible, and all-encompassing approach to risk management that is in line with corporate goals and operational requirements, eventually leading to an environment in the workplace that is safer and more compliant.

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4. New Functionality and Reporting:

Introduction:

Our company is prepared to assess and perhaps implement a number of new features targeted at fortifying our systems in light of recent security breaches, most notably the Equifax event. This paper looks at these suggested improvements with two main goals in mind: improving security and implementing cutting-edge tech to provide better customer service. This paper assesses post-Equifax enhancements that have been suggested with the goal of fortifying systems. Its emphasis is on cutting edge technology for customer service and security measures. In order to fix vulnerabilities and strategically grow our services, we evaluate the benefits right once as well as the security consequences, matching updates with industry standards.

Business requirement Overview:

The company is contemplating the incorporation of new technological functions as part of its ongoing efforts to improve our systems and address risks brought to light by the recent Equifax data incident. These developments aim to strengthen our backend procedures to protect against potential security concerns, in addition to enhancing client interaction through AI-driven services.

Proposed Technological Enhancements:

- In order to provide consumers with individualized financial advise, an **AI-based Financial Agent System** must be introduced. To handle sensitive customer data safely and maintain compliance with strict data privacy rules like GDPR, this requires the implementation of strong data protection mechanisms.
- **Third-party Development for Customer Service Analysis** includes evaluating past customer interactions and data to improve the quality of services; this necessitates careful selection of third-party suppliers to minimize the risks associated with data handling and guarantee compliance with GDPR regulations and data security requirements.
- **The proposed AI-based Financial Agent App managed by a third party** uses an externally produced and managed mobile application to increase consumer engagement.
- **Outsourcing Identity Verification to a third party** concentrates on the precise verification of customer identity documents, which is a vital task in the fight against identity theft. Processing data securely and legally requires close respect to regulatory compliance and data privacy.
- **Enhancing Software Development and System Monitoring processes** intends to enhance monitoring capabilities and build software engineering resilience in order to identify and handle incidents more skillfully. This approach is influenced by the security lapses found in the Equifax hack, which highlights the significance of integrating sophisticated monitoring tools.

Standards and Compliance Requirements:

- **PCI-DSS:** Ensuring PCI-DSS compliance is crucial for any new features that process payments in order to safeguard payment information.
- **ISO/IEC 27001:** For the information security management system (ISMS) to be established, maintained, and continuously improved, adoption of this standard is essential.
- **GDPR:** The GDPR emphasizes the necessity for data minimization, purpose limitation, and individual rights, and it must be followed by all functionalities that process personal data.

Risk Considerations:

The approach needs to be extremely cautious in light of the lessons learned from the Equifax incident, especially with regard to third-party integrations and the implementation of new technology. The following are some risks connected to these integrations:

- **Data breaches through third parties:** Significant breaches can result from third-party vulnerabilities, as demonstrated by prior high-profile cases such as the SolarWinds hack.
- **Insufficient data protection measures:** To avoid the mistakes made in earlier breaches, any new system must include cutting-edge data protection techniques from the beginning.
- **Compliance risks:** It is imperative to ensure that any new features adhere to local and international rules in order to prevent legal and financial ramifications.
- **Integration Complexity:** Complex integration issues may arise from the introduction of new systems, particularly those that are administered by third parties. Unexpected security flaws could arise from this complexity, especially if different systems interact in ways that weren't predicted or fully verified.

Control Recommendations:

Robust Third-party Security Assessments: Implementing thorough security assessments for all third-party vendors is crucial to reducing the risks associated with integrating third-party services for creating and managing AI-driven financial agent systems and customer identity verification. These assessments should include regular audits, penetration testing, and strict adherence to security standards. Drawing on the lessons learned from the Equifax breach, which highlighted the significance of thorough assessments to prevent similar incidents, regular audits and penetration testing are also necessary.

Enhanced Data Protection Protocols: Maintaining trust and compliance requires implementing end-to-end encryption for all data in transit and at rest, along with strong access control mechanisms like multi-factor authentication and role-based access controls, which are informed by GDPR regulations and NIST guidelines for data protection.

Adaptive Risk Management Framework: In order to create a flexible structure for consistently recognizing, evaluating, and handling risks related to new technologies and partnerships with third parties, create a risk management framework that includes ongoing surveillance, real-time threat detection systems, and frequent modifications to risk assessment techniques in response to new threats. This framework is motivated by the NIST SP800-39's

focus on an integrated risk management approach, which is essential for adjusting to changing IT environments.

Secure Software Development Lifecycle (SDLC): Integrate security best practices throughout the Software Development Life Cycle (SDLC), from initial design through deployment and maintenance, in order to improve the security and resilience of software development processes. DevSecOps practices can be used to ensure a continuous security focus, thereby embedding security within the development process in accordance with ISO/IEC 27001 standards to address vulnerabilities early and throughout the lifecycle.

The recommended measures are intended to mitigate risks found in the examination of the Equifax incident by integrating new technologies in a comprehensive manner. Technological innovations are made secure, compliant, and resistant to new threats through adherence to standards and continuous security updates and testing.

Outcome of Business Process:

Automation and Efficiency: Customer service can be provided more quickly and effectively by automating repetitive operations with the use of AI-driven solutions, such as financial agent systems. Employees are free to concentrate on more difficult problems as a result of the decreased manual work, which may increase output.

Vendor Management: Vendor management becomes more complicated when using third-party services for tasks like application development and consumer data analysis. To manage risks related to data security and compliance, monitor performance, and guarantee service quality, businesses need to implement robust vendor supervision procedures.

Customer Relationship Management: Businesses may be able to increase customer engagement and loyalty by implementing technology that improve customer connection, including tailored AI agents. To ensure that customer interactions are handled consistently across all platforms, new data inputs and analytical capabilities must be integrated into CRM systems, which also need to be updated.

Security and Compliance: Security protocol changes will be required due to advancements in software development and system monitoring. This entails making sure that security measures are up to date with emerging technologies and legal standards, as well as incorporating security into the software development lifecycle (SDLC) at every stage and improving monitoring tools to quickly identify and address threats.

Conclusion:

This suggestion acts as a basic road map for negotiating the difficulties of contemporary system upgrades in a dangerously perilous cyberspace. The statement highlights the necessity of adopting a risk-driven and asset-centric approach that not only caters to the organization's current demands but also puts it in a favourable position to handle future security threats.

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