

Proficy Smart Factory MES SaaS Technology

Business Value of Proficy Smart Factory MES SaaS Technology

The technology behind GE Vernova's Smart Factory MES SaaS solutions deliver significant business value designed to enhance operational efficiency, security, scalability, and customer satisfaction. These solutions empower industrial operations with cutting-edge technology, providing robust infrastructure and reliable service delivery.

The following sections within this document will offer an in-depth discussion of 9 distinct technical areas delivering value, including the following benefits:

- **Scalability and Availability:** The SaaS solutions ensure operational continuity with dynamic scalability, minimizing downtime and optimizing resource utilization. This flexibility supports growth and adapts to fluctuating demands, enhancing business efficiency.
- **Security and Compliance:** Advanced authentication, authorization, and security protocols protect sensitive data while ensuring regulatory compliance with standards such as GDPR. This robust security framework reduces the risk of data breaches and builds customer trust.
- **Risk Management:** Through rigorous security assessments and penetration testing, GE Vernova proactively identifies vulnerabilities, safeguarding operations against cyber threats and minimizing legal risks.
- **Data Management:** Efficient storage, backup, and restoration processes protect against data loss and ensure rapid recovery, supporting seamless operations and informed decision-making.
- **Customization and Integration:** Tailored solutions allow businesses to adapt to specific workflows, improving efficiency and facilitating expansion. Integration capabilities enhance data flow and connectivity, driving comprehensive operational strategies.
- **Monitoring and Notification:** Real-time monitoring and alerting systems enable quick incident response and performance optimization, ensuring continuous service delivery and operational resilience.
- **Continuous Improvement:** Regular updates provide cutting-edge features, fix bugs, and patch vulnerabilities, maintaining software relevance and enhancing user satisfaction.

In the following sections, we will embark on an exciting exploration of how Proficy Smart Factory deliver these exceptional benefits. Prepare to discover how cutting-edge technology redefine efficiency, security, and scalability. Join us as we delve into the dynamic world of the technology behind Proficy Smart Factory MES SaaS.

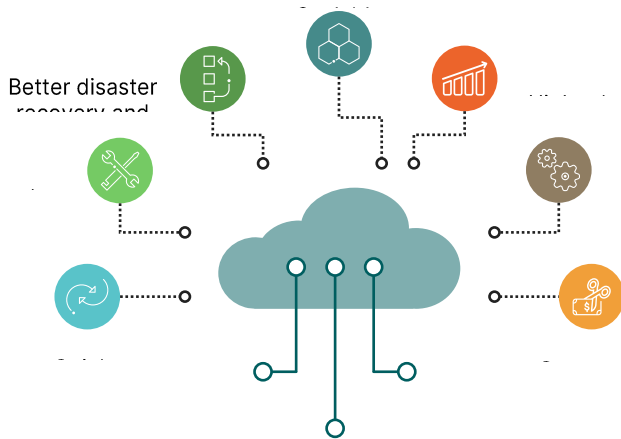


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Scalability and Availability

GE Vernova's Smart Factory MES SaaS leverages cutting-edge cloud technologies to ensure robust scalability, high availability and smooth operations across all regions supported by AWS (except Gov Cloud). Multiple Availability Zones (AZs) are applicable for services that have been containerized. By utilizing multiple AZs within a region, GE Vernova significantly minimizes downtime and guarantees high uptime for its services. This strategic deployment across AZs ensures that even if one zone experiences issues, the applications remain accessible through others, enhancing overall resilience.



To further bolster availability, GE Vernova employs services like Auto Scaling and Elastic Load Balancing. Auto Scaling dynamically adjusts the number of EC2 (Elastic Compute Cloud) instances based on current traffic patterns, ensuring that there is always sufficient capacity to handle fluctuating demand. This automatic scaling prevents outages due to overload by adapting to real-time resource requirements. Elastic Load Balancers play a critical role in distributing traffic across multiple instances, providing fault tolerance by redirecting requests to healthy instances if one fails, thus maintaining service continuity.

GE Vernova's SaaS solution offers a scalable version of Proficy Operations Hub, Proficy Plant Applications, and Proficy Historian, enabling deployment across different geographic regions while maintaining compliance standards. The elastic infrastructure dynamically scales resources during peak production seasons, allowing applications to respond effectively to changing workloads. Auto-scaling and load balancing ensure optimal resource utilization and cost-efficiency, while Kubernetes' self-healing workloads provide high availability through automatic failover and self-recovery mechanisms.

This comprehensive approach to scalability and availability underpins GE Vernova's commitment to delivering reliable and efficient SaaS solutions, tailored to meet the dynamic needs of modern industrial operations.

Business Values from Scalability and Availability

Scalability and availability are foundational aspects of GE Vernova's SaaS offerings, delivering key business values:

- 1. Operational Efficiency**

Scalability ensures that GE Vernova's SaaS solutions can dynamically adjust to varying demand levels, optimizing resource utilization. This flexibility prevents over-provisioning and under-utilization, resulting in cost savings and efficient operations.
- 2. Business Continuity**

High availability minimizes downtime and ensures consistent access to applications, maintaining the uninterrupted flow of business operations. This reliability is crucial for customer satisfaction and retention, as it guarantees that services are always accessible and functional – and obviously eliminate the cost from unnecessary unplanned downtime within production and for recovery.
- 3. Enhanced Customer Experience**

By providing reliable and responsive services, GE Vernova enhances the customer experience. Applications that seamlessly scale and remain available during peak periods contribute to a positive user experience, fostering loyalty and trust.
- 4. Growth Enablement**

Scalability supports business growth by allowing GE Vernova to expand its services and accommodate increased user demand without compromising performance. This capability enables the company to capture new market opportunities and scale operations efficiently.
- 5. Competitive Advantage**

Offering scalable and highly available solutions differentiates GE Vernova in the marketplace. By ensuring robust performance and reliability, GE Vernova positions itself as a leader in delivering superior SaaS solutions.

In summary, scalability and availability deliver substantial business value by enhancing operational efficiency, ensuring business continuity, improving customer experience, enabling growth, providing a competitive edge, and achieving cost efficiency.

Authentication and Authorization

GE Vernova's SaaS solutions prioritize security through robust authentication and authorization mechanisms, ensuring that only authorized personnel access critical applications and data. Utilizing Role-Based Access Control (RBAC) within AWS, GE Vernova incorporates multi-factor authentication (MFA) to enhance security further. This approach requires users to authenticate with multiple credentials, significantly reducing the risk of unauthorized access. Additionally, roles are designed with a session expiration of one hour, necessitating re-authentication to maintain continuous security vigilance.

Proficy Authentication (UAA) plays a pivotal role in providing identity-based security for Proficy applications and APIs. By supporting open standards such as OAuth2, it ensures secure and standardized authentication and authorization processes. Furthermore, GE Vernova facilitates federated single sign-on (SSO) with Azure Active Directory (AD), allowing seamless user authentication through Azure AD without needing individual application passwords. This integration supports protocols like SAML 2.0, OAuth 2.0, and OpenID Connect, offering a comprehensive single sign-on experience.

In addition to authentication protocols, GE Vernova employs data isolation and encryption to safeguard production data across various plants and suppliers. IAM, RBAC, and Kubernetes-native security policies are implemented to ensure data security across factory networks and cloud environments. The architecture adheres to regulatory compliance by meeting industry standards such as ISO 27001, NIST, and GDPR, supported by managed Kubernetes security solutions.

GE Vernova's commitment to secure access controls and compliance exemplifies its dedication to maintaining the integrity and security of its SaaS offerings, aligning with the highest industry standards.



Business Values from Authentication and Authorization

Authentication and authorization are pivotal components of GE Vernova's SaaS offerings, providing substantial business value in several areas:

1. Enhanced Security:

Implementing robust authentication protocols, such as Multi-Factor Authentication (MFA) and Role-Based Access Control (RBAC), strengthens security by ensuring that only authorized users can access sensitive data and applications. This reduces the likelihood of unauthorized access and potential security breaches, protecting company assets and maintaining trust.

2. User Efficiency and Convenience

Federated single sign-on (SSO) with Azure Active Directory (AD) simplifies the user experience by allowing seamless access to multiple applications with a single set of credentials. This enhances user efficiency, reduces password fatigue, and improves overall productivity by minimizing login barriers.

3. Compliance Assurance

By adhering to open standards like OAuth2, SAML 2.0, and OpenID Connect, GE Vernova ensures compliance with industry regulations and standards. This not only avoids legal penalties but also demonstrates the company's commitment to data protection and privacy, fostering trust among customers and partners.

4. Operational Integrity

Secure authentication and authorization mechanisms help maintain operational integrity by ensuring that access to critical systems is controlled and monitored. This safeguards against internal threats and accidental data manipulation, preserving the reliability and stability of business operations.

5. Scalability and Adaptability

The use of standardized protocols for authentication and authorization allows for scalability and adaptability to evolving business needs and technological advancements. GE Vernova can efficiently integrate new applications and systems, supporting business growth and innovation.

In summary, robust authentication and authorization practices deliver significant business value by enhancing security, improving user efficiency, ensuring compliance, maintaining operational integrity, and supporting scalability and adaptability.

Security and Vulnerability Management

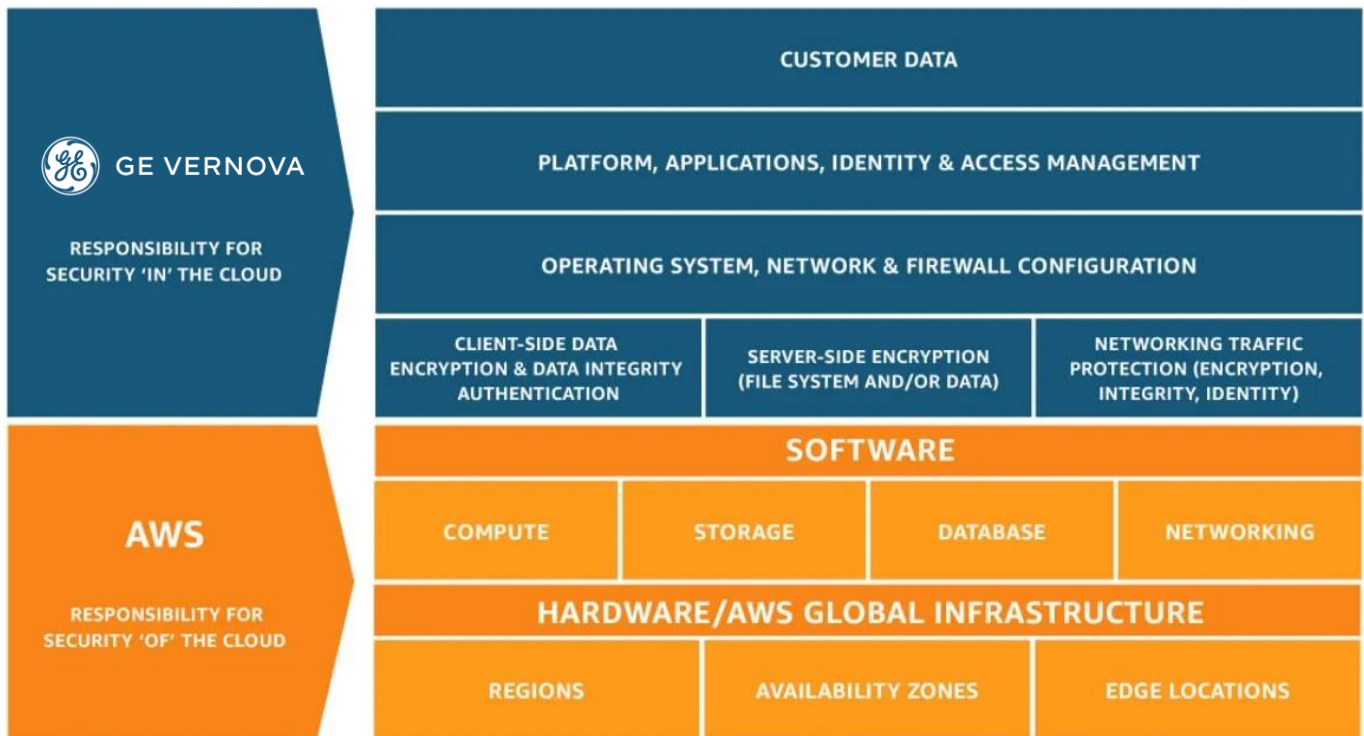
GE Vernova's Smart Factory MES SaaS offerings are fortified with robust security measures aimed at protecting application data and ensuring vulnerability management. Hosting application data on a private subnet within AWS, GE Vernova encrypts all sensitive and critical data using AWS Key Management Service (KMS). This encryption strategy ensures that data at rest is securely protected, adhering to stringent security protocols.

Web applications are shielded from external threats through a multi-layered security approach, employing AWS Web Application Firewall (WAF), AWS Shield, proxies, and AWS network firewall. Communication over the internet is secured using HTTPS, which employs Transport Layer Security (TLS) to encrypt data, thus safeguarding the integrity of data transmitted between clients and servers.

To secure data in transit, TLS encryption is implemented on AWS Network Load Balancer (NLB), ensuring that all network traffic remains secure during transmission. This encryption protocol is crucial for maintaining data confidentiality and integrity across network channels.

In addition to encryption and firewall protections, GE Vernova utilizes advanced analytics to pre-emptively identify and address potential vulnerabilities. By targeting failure modes across all plant assets, the system provides early detection of anomalies in critical assets, thereby enhancing asset availability and reliability. This comprehensive approach incorporates multiple algorithms to deliver superior outcomes, offering insights through evidence, analysis, and recommendations to improve asset health.

GE Vernova's strategic focus on security and vulnerability management reflects its commitment to providing secure, resilient, and reliable SaaS solutions, ensuring protection against evolving threats.



Business Values from Security and Vulnerability Management

Security and vulnerability management are critical components of GE Vernova's Smart Factory MES SaaS offerings, delivering substantial business value in several key areas:

1. Risk Mitigation

By implementing comprehensive security measures, GE Vernova significantly reduces the risk of data breaches and cyber-attacks, protecting sensitive information and maintaining operational integrity. This proactive approach minimizes potential financial losses and reputational damage associated with security incidents.

2. Regulatory Compliance

Adhering to industry standards such as ISO 27001, NIST, and GDPR ensures that GE Vernova meets regulatory requirements. Compliance not only avoids legal penalties but also instills confidence in customers and stakeholders, enhancing the company's reputation as a trustworthy partner.

3. Operational Continuity

Robust security protocols, including encryption and firewall protections, ensure uninterrupted service delivery. By safeguarding against vulnerabilities, GE Vernova maintains high availability and reliability of its SaaS applications, supporting seamless business operations and customer satisfaction.

4. Enhanced Decision-Making

Advanced analytics for failure mode detection provide valuable insights into asset health, enabling informed decision-making. By identifying anomalies and offering evidence-based recommendations, GE Vernova helps optimize asset management, improve operational efficiency, and drive strategic growth.

5. Competitive Advantage

A strong security posture differentiates GE Vernova from competitors, positioning it as a leader in providing secure and reliable SaaS solutions. This competitive edge attracts new customers and fosters long-term relationships, driving business growth and sustainability.

In summary, effective security and vulnerability management deliver significant business value by mitigating risks, ensuring compliance, maintaining operational continuity, facilitating informed decision-making, and enhancing competitive positioning.

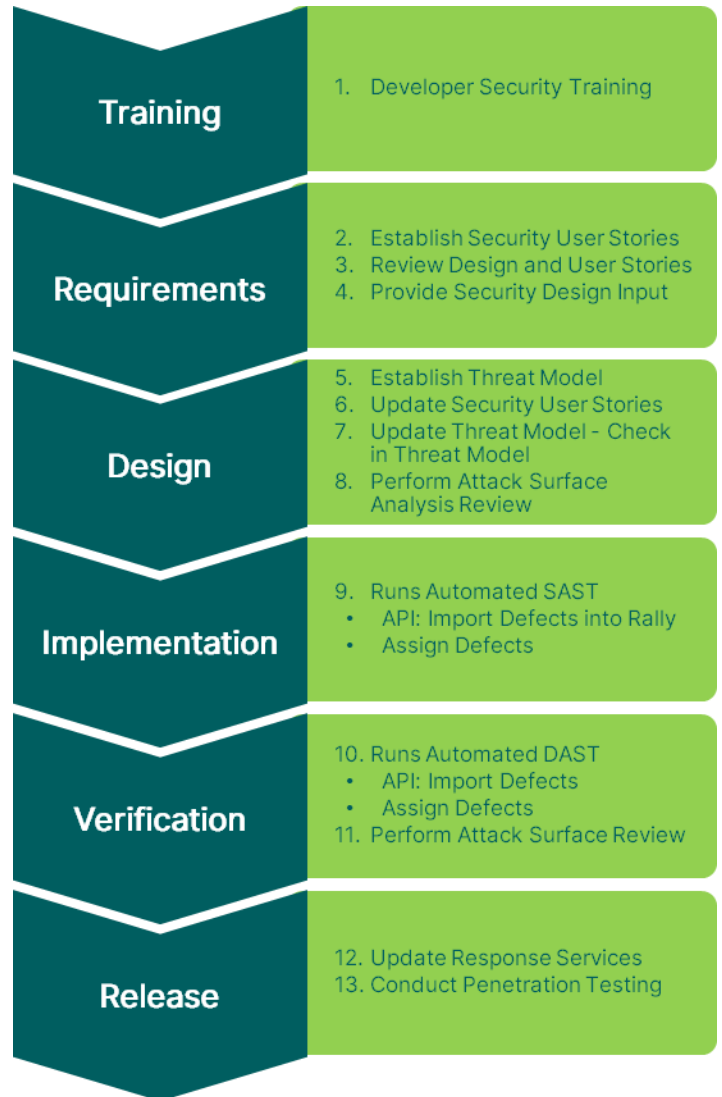
Security and Penetration Testing

GE Vernova prioritizes security through rigorous penetration testing and security assessments conducted by the GE Vernova threat research lab. This dedicated team, composed of seasoned security researchers from various leading consulting firms, undertakes periodic evaluations of GE Vernova products to ensure robust security measures are in place.

As part of the Software Development Life Cycle (SDLC), GE Vernova's Smart Factory development team integrates security practices such as threat modelling, privacy by design, static and dynamic application security testing, penetration testing, and adherence to secure development guidelines. These practices are essential for strengthening security controls, validating access management, encryption, and data protection mechanisms, and reducing the risk of data breaches.

Furthermore, these measures prevent attacks on cloud-connected Operational Technology (OT) and Industrial Control Systems (ICS), safeguarding sensitive customer and business information. By continuously enhancing security protocols, GE Vernova demonstrates its commitment to protecting its digital infrastructure and maintaining the integrity and reliability of its SaaS offerings.

The lab employs a white box methodology for its assessments, granting the team complete access to products, their sub-components, and source code. This comprehensive access allows for a thorough examination of potential vulnerabilities and enhances the team's ability to identify and address security weaknesses proactively. By simulating real-world attack scenarios, the researchers can pinpoint vulnerabilities before malicious actors can exploit them.



Business Values from Security and Penetration Testing

Security and penetration testing are integral to GE Vernova's commitment to safeguarding its SaaS offerings, delivering several key business values:

1. Proactive Risk Management

By conducting periodic security assessments and penetration tests, GE Vernova proactively identifies and mitigates vulnerabilities before they can be exploited by attackers. This proactive approach reduces the risk of data breaches and cyber-attacks, protecting sensitive customer and business information, and maintaining trust.

2. Enhanced Security Posture

Regular testing strengthens security controls by validating the effectiveness of access management, encryption, and data protection mechanisms. This continuous improvement of security measures ensures robust defenses against evolving threats, enhancing the overall security posture of GE Vernova's digital products.

3. Regulatory Compliance

Adhering to rigorous security testing protocols helps GE Vernova meet industry standards and regulatory requirements, such as ISO 27001 and GDPR. Compliance with these standards not only avoids legal penalties but also demonstrates a commitment to data protection and privacy, fostering confidence among customers and stakeholders.

4. Operational Resilience

By preventing potential attacks on cloud-connected Operational Technology (OT) and Industrial Control Systems (ICS), GE Vernova ensures the continuity and reliability of its operations. This resilience minimizes downtime and operational disruptions, maintaining high levels of customer satisfaction and trust.

5. Innovation and Growth Support:

Integrating security practices into the Software Development Life Cycle (SDLC) allows GE Vernova to develop secure and innovative solutions. This secure foundation supports business growth and enables the company to capture new market opportunities without compromising security.

6. Competitive Differentiation

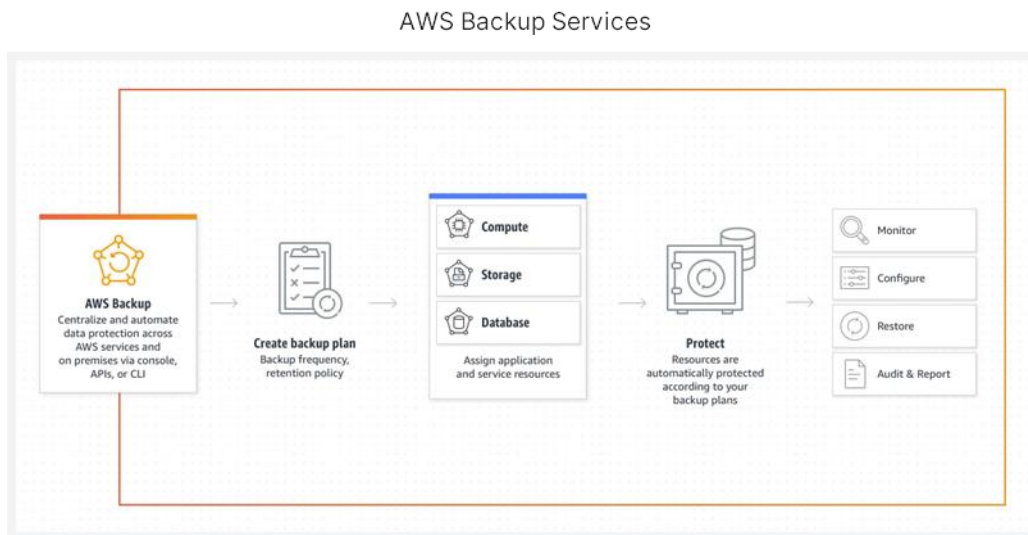
A strong security and penetration testing program differentiates GE Vernova from competitors, positioning it as a leader in delivering secure and reliable SaaS solutions. This competitive edge attracts new customers and strengthens existing relationships, driving business growth.

In summary, security and penetration testing provide significant business value by managing risks proactively, enhancing security measures, ensuring regulatory compliance, maintaining operational resilience, supporting innovation and growth, and offering a competitive advantage.

Data Storage, Backup, Retention, and Restoration

GE Vernova's SaaS solutions are designed to ensure robust data management through effective storage, backup, retention, and restoration processes. The Proficy Plant Applications Configuration is stored on AWS EKS, while Proficy Plant Applications Data resides in RDS SQL servers. Proficy Historian and Proficy Operations Hub data are maintained in EFS and Postgres databases, ensuring efficient and reliable access to critical data.

To safeguard these resources, GE Vernova's Smart Factory MES SaaS solution utilizes AWS Backup services, creating daily snapshots of EFS, EC2, and RDS with a retention period of seven days. All backups are archived in an encrypted state, with encryption keys managed by AWS, ensuring compliance with best practices and robust security measures.



Proficy Historian and Proficy Plant Applications databases are backed up using AWS services and replicated across multiple availability zones, enhancing data resilience and availability. Current production data is stored for 24 months, with options for customers to archive data before purging. Data older than 24 months is automatically purged, ensuring efficient data management.

Each customer's data is maintained in a separate VPC, ensuring complete isolation and security. Upon termination of service contracts, all resources, including data from primary, DR, and backup sites, are deleted within 30 days, with customer confirmation ensuring transparency and compliance.

These processes meet industry regulations such as GDPR, reducing legal risks and penalties by maintaining required audit trails. GE Vernova's approach protects against data loss due to cyber threats, accidental deletions, or system failures, ensuring quick recovery from disruptions. Automated data retrieval and restoration reduce manual effort and enable rapid restoration of critical business data, minimizing downtime and supporting seamless operations. Fast access to historical data enhances decision-making capabilities, ensuring efficient and informed business operations.

Business Value of Data Storage, Backup, Retention, and Restoration

The strategic implementation of data storage, backup, retention, and restoration processes within GE Vernova's Smart Factory MES SaaS offerings provides several significant business values:

1. Data Security and Compliance

By adhering to industry regulations such as GDPR, GE Vernova ensures compliance with data protection standards. This reduces legal risks and avoids penalties, while also fostering trust and confidence among customers and stakeholders.

2. Risk Mitigation

Robust backup and encryption practices protect against data loss due to cyber threats, accidental deletions, or system failures. This proactive risk management ensures the integrity and security of sensitive information, safeguarding business operations and customer data.

3. Operational Resilience

Efficient data restoration processes enable rapid recovery from ransomware attacks and operational disruptions, minimizing downtime and maintaining business continuity. This resilience supports uninterrupted service delivery and enhances customer satisfaction.

4. Enhanced Decision-Making

Fast and easy access to historical data improves decision-making capabilities by providing valuable insights and trends. This data-driven approach supports informed strategic planning and operational efficiency.

5. Customer Satisfaction and Trust

Transparent data management practices, including customer confirmation of data deletion, reinforce GE Vernova's commitment to security and accountability. This fosters long-term relationships and builds trust.

6. Scalability and Flexibility

The ability to archive and manage data efficiently supports business growth and adaptability. GE Vernova can scale its operations and services to accommodate changing demands while maintaining robust data management practices.

In summary, data storage, backup, retention, and restoration deliver substantial business value by ensuring security and compliance, mitigating risks, enhancing operational resilience, achieving cost efficiency, improving decision-making, fostering customer trust, and supporting scalability and flexibility.

Secured Data Access, Customer Environment, Logging, and Auditing

GE Vernova's Smart Factory MES SaaS offerings emphasize secured data access, comprehensive customer environment management, and robust logging and auditing mechanisms to ensure data integrity and security. Multi-Factor Authentication (MFA) is implemented for all human identities with AWS access, providing an additional layer of protection against unauthorized account access. This security measure enhances customer confidence by safeguarding sensitive information.

To further reinforce security, AWS CloudTrail is configured across all AWS accounts and regions, facilitating governance, compliance, operational auditing, and risk auditing. CloudTrail enables continuous monitoring and logging of account activity, ensuring transparency and accountability. It validates log files through integrity checks, confirming that logs remain unchanged and accurately reflect user activities. This validation detects any unauthorized alterations or deletions, preserving the integrity of audit trails.

Credentials are issued for individual identities with strong password policies and least privilege access, minimizing security risks and reducing the likelihood of data breaches, cyberattacks, and insider threats. Controlled access ensures that only authorized users interact with data, reducing errors and preventing unauthorized modifications.

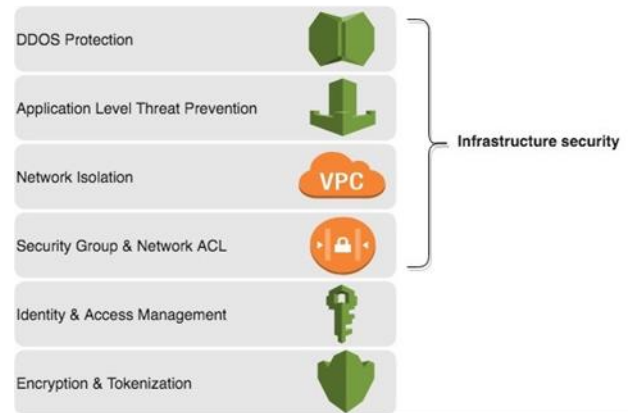
Customers have the flexibility to establish multiple environments—Dev, Pre-Prod, and Production—to suit their operational requirements. This capability allows for swift configuration transfers across environments and efficient issue resolution in lower environments, enhancing agility and responsiveness.

CloudTrail records and analyzes events, monitors performance, and facilitates troubleshooting. Logging encompasses various user activities, database logs, application logs, and service-level logs, providing a comprehensive picture of system operations. CloudTrail monitors account activity across AWS services, capturing essential details such as API caller identity, time of call, source IP address, request parameters, and response elements.

These logging and auditing practices help identify unauthorized access and unusual activities in real-time, supporting proactive security measures. They also provide a clear trail of actions within the system, aiding in swift issue resolution and forensic investigations. By tracking critical data changes, they prevent unauthorized modifications and mitigate data loss risks. Simplified audits are achieved through detailed logs of system activities and user actions, enhancing compliance and transparency.

Additionally, logs offer insights into application performance, latency, and errors, enabling proactive issue resolution and optimizing cloud resources. This comprehensive approach to secured data access, environment management, and logging and auditing underscores GE Vernova's commitment to delivering secure, reliable, and efficient SaaS solutions.

Best practices for securing sensitive data in Amazon DynamoDB



AWS CloudTrail – Audit Logs



Business Value from Secured Data Access, Customer Environment, Logging, and Auditing

The strategic implementation of secured data access, customer environment management, and logging and auditing processes within GE Vernova's SaaS offerings provides several significant business values:

1. Enhanced Security and Compliance

Multi-Factor Authentication (MFA) and controlled access protocols significantly reduce the risk of unauthorized access, data breaches, and cyberattacks. By ensuring that only authorized users can access sensitive information, GE Vernova protects its assets and fosters trust among customers and stakeholders. Compliance with security standards and regulations is maintained, avoiding legal penalties and reinforcing the company's commitment to data protection.

2. Operational Efficiency and Agility

The ability to configure multiple environments (Dev, Pre-Prod, and Production) allows customers to quickly move configurations and resolve issues at lower levels. This flexibility supports agile operations and enables rapid adaptation to changing business needs, improving overall efficiency and responsiveness.

3. Real-Time Monitoring and Issue Resolution

Advanced logging and auditing tools, such as AWS CloudTrail, provide real-time monitoring of system activities, enabling rapid identification of unauthorized access or unusual activities. This proactive approach facilitates swift issue resolution and minimizes downtime, ensuring business continuity and enhancing customer satisfaction.

4. Optimized Resource Utilization

Detailed logs provide insights into application performance, latency, and errors, helping identify inefficiencies in system usage. This information supports the optimization of cloud resources, reducing operational costs and maximizing return on investment.

5. Accountability and Transparency

Comprehensive logging and auditing practices maintain clear records of all system activities and user actions. This transparency simplifies audits, supports forensic investigations, and enhances accountability, reinforcing GE Vernova's reputation as a reliable and trustworthy partner.

6. Improved Decision-Making

Insights gained from logging and auditing enable informed decision-making by providing valuable data on system performance and user interactions. This data-driven approach supports strategic planning and operational improvements, driving business growth and innovation.

In summary, secured data access, customer environment management, and robust logging and auditing practices deliver substantial business value by enhancing security and compliance, improving operational efficiency, enabling real-time monitoring, optimizing resource utilization, ensuring accountability and transparency, and supporting informed decision-making.

Monitoring and Notification

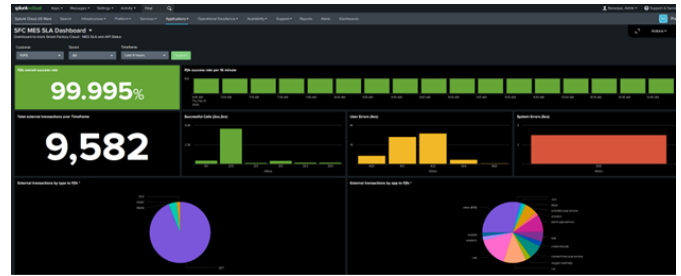
GE Vernova's SaaS solutions incorporate robust monitoring and notification mechanisms to ensure optimal performance and security. Utilizing enterprise monitoring solution, the system collects raw data and processes it into readable, near real-time metrics, providing comprehensive insights into the operational status of AWS infrastructure and Smart Factory Cloud services.

The Smart Factory MES SaaS solution is equipped with alerting capabilities, notifying GE Vernova SaaS teams about critical security threats, outages, performance issues, or system failures. These notifications are pivotal in maintaining the security, availability, and reliability of the services provided. Incident alerting plays a crucial role by generating alerts that highlight changes, high-risk actions, or failures within the SaaS environment, allowing for quick responses to emerging issues.

Proactive detection of performance issues and failures is a key feature, enabling rapid root cause analysis and minimizing downtime. Real-time detection of anomalies and security breaches ensures swift action and supports maintaining audit trails for regulatory compliance, such as ISO 27001 and SOC 2 standards. These audit trails are essential for incident response and forensic investigations, providing detailed insights into system activities.

Additionally, monitoring capabilities identify slow API responses or service bottlenecks and offer insights into user behavior and interactions, which are valuable for optimizing service delivery. Predictive analytics further enhance the system by preventing service degradation, ensuring that potential issues are addressed before they impact performance.

Through these monitoring and notification processes, GE Vernova's Smart Factory MES SaaS solutions demonstrate a commitment to delivering reliable, secure, and efficient services, empowering customers to maintain seamless operations and uphold high standards of service quality.



Business Value from Monitoring and Notification

The implementation of comprehensive monitoring and notification systems within GE Vernova's Smart Factory MES SaaS offerings provides several significant business values:

1. Enhanced Operational Reliability

By continuously monitoring system performance and infrastructure status, GE Vernova ensures high availability and reliability of its services. This proactive approach minimizes downtime and service interruptions, maintaining seamless business operations and enhancing customer satisfaction.

2. Real-Time Threat Detection

Monitoring capabilities enable real-time detection of security threats and anomalies, allowing for immediate responses to potential breaches. This rapid identification and resolution of issues protect sensitive data and reduce the risk of cyberattacks, safeguarding business integrity.

3. Swift Incident Response

Alerting systems notify GE Vernova SaaS teams of ongoing issues, enabling quick root cause analysis and resolution. This efficiency reduces downtime and operational disruptions, preserving business continuity and supporting a responsive service environment.

4. Regulatory Compliance

By ensuring audit trails and maintaining detailed records of system activities, monitoring processes support compliance with industry regulations such as ISO 27001. This compliance reduces legal risks and reinforces the company's commitment to data protection and security standards.

6. Performance Optimization

Insights gained from monitoring help identify service bottlenecks and slow API responses, facilitating performance optimization. By understanding user behaviour and interactions, GE Vernova can enhance service delivery, improving user experience and operational efficiency.

7. Predictive Analytics and Prevention

Predictive analytics derived from monitoring data enable the anticipation and prevention of service degradation. This capability ensures that potential issues are addressed before they impact performance, supporting proactive maintenance and continuous improvement.

8. Informed Decision-Making

Real-time metrics and alerts provide valuable data that inform strategic planning and operational decisions. This data-driven approach supports innovation and growth, ensuring that GE Vernova remains competitive and responsive to evolving business needs.

In summary, monitoring and notification systems deliver substantial business value by enhancing operational reliability, enabling real-time threat detection, supporting swift incident response, ensuring regulatory compliance, optimizing performance, enabling predictive analytics, and facilitating informed decision-making.

Customization

GE Vernova's Smart Factory MES SaaS solution offers flexible customization options to meet the unique design requirements of its users. Recognizing that specific operational needs may necessitate programmatic customizations, GE Vernova provides Application Support packages. These packages empower customers and their partners, including service teams and select System Integrators, to request revisions and approvals for programmatic customizations. This process ensures that all modifications maintain high levels of security, technical support, and compatibility with future upgrades.

While optional, Application Support packages become essential for customers requiring custom configurations not included in the standard Proficiency Smart Factory package. By allowing controlled customization, GE Vernova enhances the likelihood that sites will adopt solutions tailored to their specific needs, thus improving user satisfaction and operational efficiency.

Customization enables manufacturers to adapt the software to their specific production workflows,

minimizing inefficiencies and reducing the need for workarounds. This tailored approach allows teams to configure the software to match their exact requirements, optimizing processes and boosting productivity. Furthermore, customizable software can seamlessly adapt to regional regulations, languages, and manufacturing standards, facilitating international expansion and compliance.

Personalized dashboards and reports are another key feature, enabling users to focus on the most relevant KPIs for their operations. This customization enhances decision-making by providing insights that are directly aligned with business objectives. Additionally, the ability to integrate the SaaS platform with existing systems, such as ERP or IoT solutions, improves data flow and connectivity, driving comprehensive and informed operational strategies.

Through these customization capabilities, GE Vernova ensures its Smart Factory MES SaaS solutions remain adaptable and responsive to diverse business needs, supporting efficiency, growth, and international scalability.



Identify and Prioritize Business Requirements

- Conduct a thorough analysis of your business processes to understand specific needs and pain points.
- Prioritize these requirements based on their impact on efficiency and productivity, and use this prioritized list to guide the customization of the SaaS application



Leverage Integration Capabilities

- Utilize the API and integration tools provided by the SaaS application to seamlessly connect it with your existing systems (e.g. CRM, ERP, HRM).
- Ensure that data flows smoothly between different platforms to maintain consistency and streamline operations across your business processes.

Business Value from Customization

Customization within GE Vernova's Smart Factory MES SaaS solutions provides several critical business values:

1. Enhanced Adoption and User Satisfaction

By allowing sites to tailor the software to their specific needs, GE Vernova increases the likelihood of adoption and user satisfaction. Customization ensures that the solution fits seamlessly into existing workflows, reducing resistance and promoting efficient utilization.

2. Operational Efficiency

Customizable software enables manufacturers to optimize production workflows by aligning the solution with their specific processes. This reduces inefficiencies and eliminates the need for workarounds, leading to streamlined operations and improved productivity.

3. Flexibility and Adaptability

The ability to customize software to meet regional regulations, languages, and manufacturing standards supports international expansion. GE Vernova's Smart Factory MES SaaS solutions can adapt to diverse market requirements, facilitating compliance and growth in new regions.

4. Targeted Insights and Decision-Making

Personalized dashboards and reports allow users to focus on the most relevant KPIs for their operations. This targeted approach provides valuable insights, enhancing decision-making and strategic planning.

5. Integration and Connectivity

Customization enables seamless integration with existing ERP and IoT systems, improving data flow and connectivity. This integration supports comprehensive operational strategies and enhances overall business intelligence.

6. Competitive Advantage

Offering customizable solutions differentiates GE Vernova from competitors, positioning it as a leader in providing tailored Smart Factory MES SaaS solutions that meet specific customer needs. This competitive edge attracts new clients and strengthens existing relationships, driving business growth.

In summary, customization delivers substantial business value by enhancing adoption and user satisfaction, improving operational efficiency, providing flexibility for international expansion, targeting insights for better decision-making, enabling seamless integration, and offering a competitive advantage.

Update and Upgrade Process

EMERGENCY FIX (HOTFIX)	UPDATE	UPGRADE
<p>Definition</p> <p>Time-sensitive patch designed to address critical issues that are causing or could cause significant disruptions to any SFC services hosted in cloud.</p> <p>These unplanned, high-priority updates are only applicable to resolve emergency security vulnerabilities, critical bugs or system failures that impact the application's availability, security or performance.</p>	<p>Definition</p> <p>An update is a routine release that introduces minor improvements, bug fixes and security patches. While updates do not typically introduce new features or major changes, they enhance the stability, performance and security of the application.</p>	<p>Definition</p> <p>An upgrade will be a major release that involves significant changes, including new features, enhancements or overhauls to the application's architecture. This may involve migrating to new frameworks, platforms or a complete redesign of certain application components.</p>
<p>Important Points</p> <ul style="list-style-type: none">• Immediate Release: Deployed as soon as fix is ready & tested, outside regular cycles through Emergency Change Request.• Minimal Changes: Focused solely on fixing the issue.• Rapid Deployment: Implemented with minimal testing to restore operations quickly.• Suggested Frequency: On-demand in emergency situations.	<p>Important Points</p> <ul style="list-style-type: none">• Planned Release: Part of a regular maintenance schedule.• Minor Impact: Enhances stability without major changes.• Minimal Downtime: Usually applied with little to no disruption to users or customer environments.• Suggested Frequency: Monthly	<p>Important Points</p> <ul style="list-style-type: none">• Major Impact: May involve significant changes like database schema updates or infrastructure upgrades.• Planned Downtime: Requires downtime. Needs careful planning and testing. Less frequent since there will be impact to users.• Comprehensive Testing: Extensive testing to ensure stability.• Suggested Frequency: Bi-Annual

Business Value from Update and Upgrade Process

GE Vernova's regular update and upgrade process for its Smart Factory MES SaaS solutions provides critical business values that enhance customer satisfaction and operational efficiency. Frequent updates improve the user experience by fixing bugs and adding new features, thereby increasing customer trust and reducing churn. This proactive approach to software improvements ensures that customers have access to the latest and most advanced version of the product, maintaining its relevance in a competitive market.

Moreover, regular updates are vital for addressing vulnerabilities and ensuring compliance with industry regulations, significantly boosting data security. By continuously improving the software, GE Vernova ensures its solutions can efficiently handle increasing user demands, supporting scalable growth and adaptability.

Updates also enhance production efficiency by improving real-time monitoring, predictive maintenance, and automation, ultimately reducing downtime. This focus on operational enhancement ensures that businesses can maintain high levels of productivity and reliability.

Overall, GE Vernova's commitment to regular updates and upgrades not only protects against cyber threats and supports regulatory compliance but also fosters user adoption and customer satisfaction.

Conclusion

GE Vernova's Smart Factory MES SaaS solutions embody a comprehensive approach to delivering secure, efficient, and adaptable software solutions tailored to meet the dynamic needs of modern industrial operations. Through strategic implementation across various domains, GE Vernova ensures robust scalability and availability, allowing businesses to maintain operational continuity and reliability. By prioritizing authentication and authorization, the company enhances security and compliance, protecting sensitive data and fostering trust among users.

Security and penetration testing fortify the SaaS offerings against evolving threats, while sophisticated data storage, backup, retention, and restoration processes ensure data integrity and quick recovery from disruptions. Secured data access, customer environment management, and meticulous logging and auditing practices further reinforce operational stability and transparency.

The solutions' monitoring and notification capabilities provide real-time insights, enabling rapid incident response and performance optimization.

Customization options empower users to tailor the software to their specific workflows, enhancing efficiency and supporting international scalability. Regular updates and upgrades sustain customer satisfaction by delivering cutting-edge features and maintaining compliance with industry standards.

Overall, GE Vernova's comprehensive Smart Factory MES SaaS strategy supports growth, innovation, and adaptability, driving competitive advantage and ensuring long-term business success. Through continuous improvement and unwavering commitment to security and efficiency, GE Vernova stands as a leader in providing reliable and tailored SaaS solutions.

About GE Vernova Proficy

Software & Services

GE Vernova's Proficy® Software & Services empowers teams, illuminating the path to a greener, more profitable future. Our proven industrial software accelerates innovation, enables connected workers, and operationalizes sustainability. We're driving measurable progress for over 20,000 diverse customers around the world.

The Proficy portfolio includes cloud-based and on-prem HMI/SCADA, MES, industrial data management, and analytics. Our software solves the toughest industrial challenges and is used in applications such as discrete, hybrid, and continuous manufacturing; utilities automation; metro transit; and much more. Proficy offers architecture flexibility including single machines, remote substations, and complex, distributed networks that span multiple factories and geographies.

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