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Using Enterprise Data for Analytics and AI Is Accelerating the Need for Data Modernization

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Abstract: A robust data strategy is vital for successful digital transformation and data modernization. It focuses on data handling rules and practices, including governance and compliance management as its key components. This showcase examines the significance of maintaining trusted data in databases and data lakehouses to aid in modernization endeavors like effectively integrating with analytics and generative AI technology. By utilizing tools and services provided by Amazon Web Services (AWS) and AWS partners like Effectual, organizations can ensure top-notch data quality standards while adhering to regulations and streamlining data management processes. When businesses align their data strategy with the capabilities offered by the AWS platforms and effectively utilize AWS features, they can improve efficiency, opening up opportunities for AI advancement and other future innovations. Effectual, an AWS Premier Tier Services Partner specializing in enterprise digital transformation, from migrations to modernizations in the cloud, can help organizations accelerate their journey.

The Path to Data Modernization Continues for Most Organizations

With the introduction of generative AI proliferating throughout organizations, the need for data modernization has never been more critical. Research from TechTarget's Enterprise Strategy Group showed that 74% of organizations are still in the digital transformation process or planning stages, while only 13% have achieved a mature level of transformation.¹ For chief data officers (CDOs), this highlights a pressing need to focus on modernizing legacy data systems, migrating to efficient and scalable cloud-based solutions, and enabling advanced capabilities. Data modernization involves updating outdated data infrastructures to improve accessibility, usability, and scalability. These improvements support the adoption of new technologies like analytics, AI, and generative AI to enhance operational efficiency, drive innovation, and create competitive advantages.

Some of the critical benefits of modernizing include:

- **Scalability and efficiency.** Data modernization into cloud-based solutions affords dynamic infrastructure scalability and cost-effective alternatives to legacy on-premises systems.
- **Trusted data sources.** Data modernization enhances the ability to consolidate and curate operational data into trusted data sources with the data quality, accuracy, and completeness needed to empower employees with the necessary data for decision-making.

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74% of organizations are in the process of implementing or still planning their digital transformative initiatives, while only 13% reported being at a mature stage.

¹ Source: Enterprise Strategy Group Research Report, [2024 Technology Spending Intentions Survey](#), February 2024.

- **AI and analytics capabilities.** Modern data platforms support using advanced analytics and AI. Generative AI in particular requires a trusted data source to have clear and accurate responses. This is especially true when using techniques such as retrieval-augmented generation (RAG) which uses integrated enterprise data to improve generative AI models and outputs.

Behind every data modernization project lies one of the biggest obstacles and most complicated parts of modernization: migrating data from legacy systems to modern, cloud-native systems. Legacy systems are often siloed, incompatible with newer systems, and expensive to maintain. Typical modernization efforts involve re-platforming, re-architecting, or rebuilding data silos to leverage the latest capabilities of cloud computing, data lakes, and real-time analytics.

Modernizing data systems also requires robust data governance frameworks to ensure data quality, lineage, and compliance with regulatory requirements. Effective data governance is crucial for maintaining control and compliance as data evolves. Essential governance practices include:

- **Data quality management.** This entails implementing processes to maintain high data-quality standards.
- **Data lineage tracking.** This ensures transparency in data flow and transformations.
- **Regulatory compliance.** Adhering to industry regulations and standards helps to avoid legal repercussions.

Organizations need a robust data governance framework to ensure that the data remains accurate, clean, and trusted. This will ensure that their business doesn't fall out of compliance with ever-evolving rules and regulations and that the data is secure and ready for organization-wide use.

A Successful Business Strategy Depends on a Strong Data Strategy

Today, an organization's business strategy depends on a successful data strategy. With a modernized infrastructure, good data governance, and a solid data strategy, organizations are set up to leverage advanced data management solutions, including generative AI, to accelerate innovation.

5 Key Considerations for a Strong Data Strategy

A robust data strategy underpins the effective use of data by maximizing the value it can deliver and helping achieve business goals. Here are five points to consider:

Data Governance and Compliance

Governance frameworks provide direction and guidelines to ensure data quality, security, privacy, and regulation compliance. Key elements include defining data ownership, creating data use and access policies, and establishing data stewardship and auditing standards.

Data Accessibility and Usability

Data must be securely accessible by the right people, for the right reasons, at the right time to drive decision-making. Strategic actions might include developing an integrated data platform, providing self-service data tools, and making sure that data is available in formats that are easy to understand and use.



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46% of organizations only somewhat trusted the data given to employees for decision-making.²

² Source: Enterprise Strategy Group Complete Survey Results, [Data Governance in the Age of AI](#), June 2024.

Data Quality and Consistency

Poor-quality screening, reporting, and recording (such as ambiguous or missing criteria, repeated entries, or other inaccuracies or inconsistencies) can result in decisions based on inadequate or misleading information that can undermine trust in the system. Consider creating data validation protocols, enforcing data input and formatting standards, and tracking data quality.

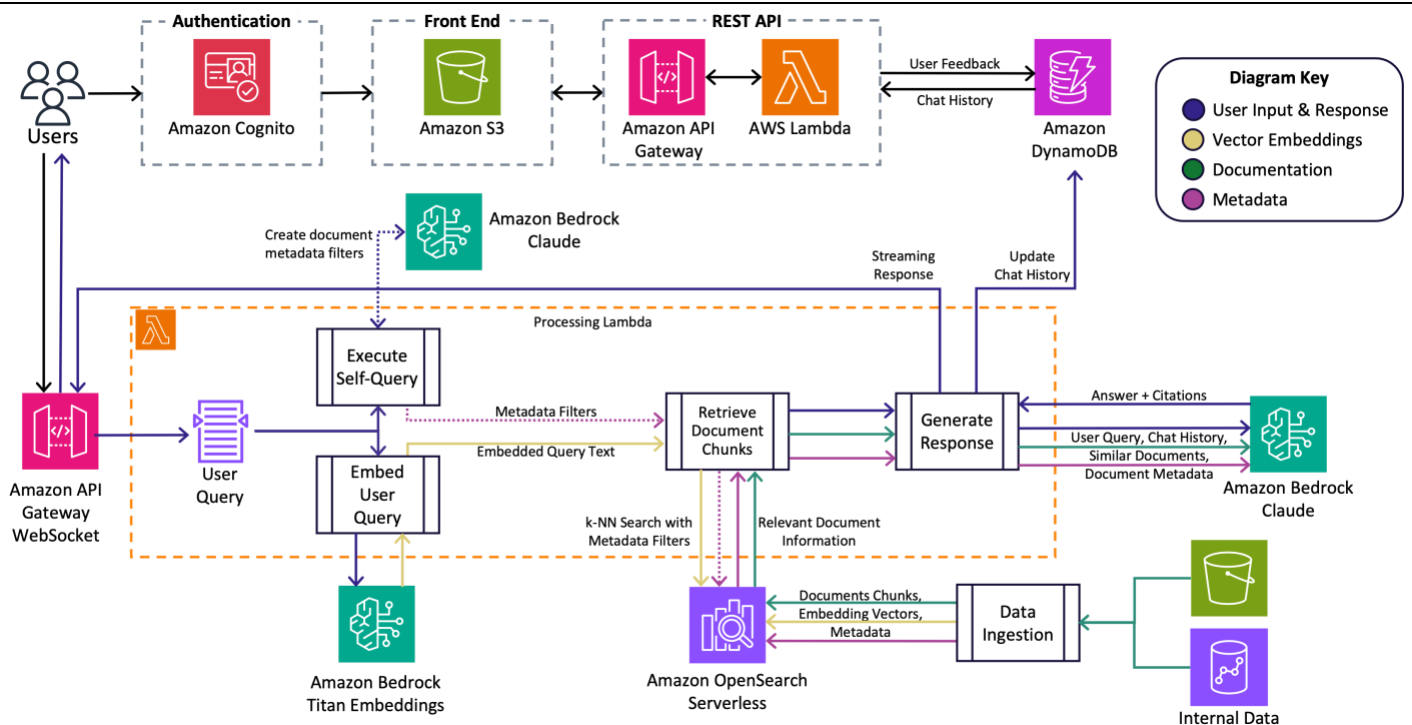
Scalability and Flexibility

With data volumes expanding and new technologies bound to emerge, data strategies must be ready to scale to future requirements and stay agile. Organizations should use cloud-based services for flexibility, plan for increased storage needs, and regularly check in with their vision to adopt emerging technologies, such as generative AI.

Empowering AI and Analytics for Accelerated Insights

An effective data strategy will empower organizations to derive faster, data-driven insights and innovation using AI and other advanced analytics technologies. Organizations must implement AI-ready IT infrastructure, integrate sophisticated analytics tools, and ensure data is appropriately structured and prepared for AI.

Figure 1. Generative AI RAG Architecture



Source: Effectual, Inc.

Data Modernization Accelerates the Use of Generative AI

Organizations are working quickly to explore generative AI in order to build differentiated applications to increase productivity, innovate, enhance customer experiences, and build competitive advantages. But at the heart of every generative AI solution needs to be a trusted data source. Data modernization delivers this foundation to build generative AI solutions, and Effectual with AWS can help bring these solutions from concept to production.

Figure 1 is a workflow for building a generative AI solution on AWS. For example, suppose you wanted to create an AI assistant to help customers understand your company's products and how to use them. In that case, you start with a trusted data source, which may be a product catalog, knowledge base, and support history. Next, the data can be processed with an AWS vector-enabled database such as AWS OpenSearch or Amazon RDS for PostgreSQL with the vector extension. Vectors enable generative AI to identify similarities within data, enhancing the experience of using an AI assistant. Effectual's Generative AI Accelerator enables organizations to quickly deploy Agentic RAG applications leveraging AWS Bedrock to interface with cutting-edge foundational models such as Anthropic's Claude. For more information on Effectual's Generative AI Accelerator, see [this video](#). In this example, the new AI Assistant can reply to prompts (e.g., questions, statements) using the company's unique data for context and answer direct product-related questions, provide support details, and other pertinent information. Effectual can help organizations work through the process of building these solutions from start to finish, including building front-end AI assistants, chatbots, and dashboards to engage with employees, customers, and more.

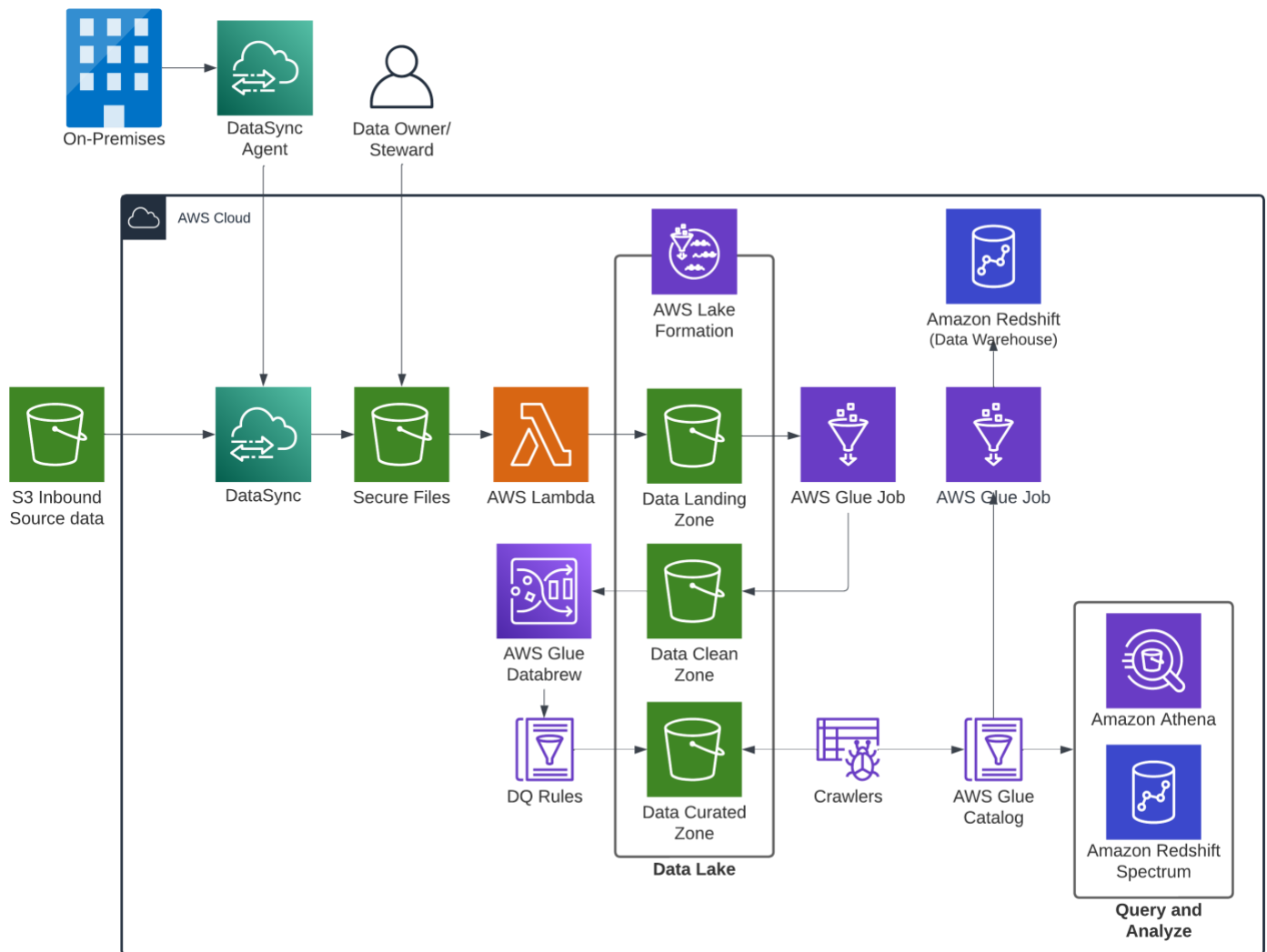
Effectual and Amazon Web Services Working Together

The Effectual Data Intelligence Platform, as illustrated in Figure 2, empowers organizations to seamlessly modernize data utilizing various AWS services to manage and process data through different stages. Initially, data is ingested from sources via AWS DataSync into Amazon S3. The data is then organized and secured with AWS Lambda, which facilitates event-driven processing.

For data management, AWS Lake Formation is used to set up a secure data lake, streamlining access and governance. Data is then categorized into zones within Amazon S3: the Data Landing Zone, Data Clean Zone, and Data Curated Zone, to ensure a structured data lifecycle.

The platform uses AWS Glue for ETL (extract, transform, load) processes, which involve data cleansing, transformation, and preparation. AWS Glue DataBrew further enhances data quality through the application of data quality rules. The data cataloging is handled by AWS Glue Catalog, which organizes and indexes the data, making it readily accessible.

For querying and analyzing data, Amazon Athena is utilized, providing an interactive querying capability. Additionally, Amazon Redshift acts as the data warehouse, where structured data is stored for complex analytics, and Amazon Redshift Spectrum is used for querying data directly from the data lake without needing to load it into Redshift, facilitating a seamless integration between data warehousing and data lake storage.

Figure 2. Effectual Data Intelligence Platform

Source: Effectual, Inc.

By combining these AWS tools with Effectual's cloud and data expertise, the platform enables organizations to modernize their data infrastructure, unlock the potential of their data, and create reliable data foundations for advanced AI and generative AI applications.

Why Choose Effectual for Data Strategy and Modernization

Effectual is a highly experienced AWS Premier Partner dedicated to helping organizations solve complex business challenges through cloud-based solutions. With over two decades of industry experience, the team has guided countless businesses through their cloud transformation journeys, from data center migrations to application modernization and cloud optimization. Services include app development, migration, data intelligence, and cloud management, enabling customers to leverage AWS cloud resources while knowing they have a trusted partner at every step.

Beyond cloud services, Effectual drives digital transformations and builds trusted data sources essential for analytics, machine learning and generative AI applications. Effectual helps organizations leverage cutting-edge

tools like RAG and vector search to create intelligent solutions that enhance productivity and operational efficiency. Whether developing AI-driven insights, building scalable solutions for real-time data processing, or creating architectures to support AI and machine learning initiatives, Effectual's expertise ensures that businesses are equipped to succeed in the rapidly evolving digital landscape. By empowering organizations with the proper infrastructure, data strategies, and advanced tools, they can unlock the full potential of AI to drive innovation and growth.

Conclusion

AI opens up a new world of power for organizations, but with this comes more scrutiny. Organizations worldwide are accelerating their data modernization with an eye on building trusted data sources for AI and analytics to accelerate corporate intelligence and growth. Data strategies have become intertwined with business strategies, with AI as the accelerant for transformation. However, cloud adoption is crucial for effectively building trusted data sources that are reliable for accurate and governed decision-making.

Amazon Web Services is leading the marketing for AI adoption with a comprehensive portfolio of all the AI capabilities an organization needs today, along with thought leadership and continued investment in the future. As a Premier AWS Partner, Effectual brings another layer of experience to help the organization reach modernization and generative AI goals, with the experience organizations need in this dynamic market. Their portfolio of services, including app development, complements AWS to bring a holistic approach to clients. Enterprise Strategy Group strongly recommends that, if you are looking at modernization or building generative AI solutions, you engage in a conversation with Effectual and learn from their expertise.

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