



Embracing the Future

The Resilience and Evolution of
Mainframe, Host Access, and
COBOL in a Digital Era



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The heritage of mainframe computing

Are mainframes merely relics of the past, or do they play a crucial role in the future of enterprise computing? To explore this question, we recently commissioned a survey from Vanson Bourne titled "The State of Mainframe Modernization and Host Connectivity." The findings indicate a clear answer for many organizations: despite the appeal of emerging technologies like cloud computing and microservices, mainframes and COBOL applications remain essential to daily operations. Renowned for their reliability, security, and capacity to manage vast transaction volumes, these systems are indispensable in sectors like finance, healthcare, and government.

As businesses pursue innovation, there is growing recognition of the importance of mainframe modernization strategies that not only maintain the reliability of core systems but also incorporate cutting-edge advancements. Striking the right balance allows organizations to leverage the strengths of mainframes while positioning themselves for future growth and technological progress.

With enterprises increasingly reliant on mainframe systems, host access and terminal emulation have become essential for maintaining and enhancing these core environments. Host access solutions facilitate secure connections to mainframe systems, while terminal emulation software allows modern computer systems to replicate traditional mainframe interfaces. This seamless integration of old and new technologies ensures that businesses can maximize the potential of their robust mainframe applications while offering a more user-friendly experience for employees.

Additionally, continuous delivery and effective mainframe migration are crucial for keeping these core systems agile. As companies explore cloud migration, they can enhance capabilities without sacrificing the value of their existing mainframe investments. By utilizing these tools and strategies, organizations can improve productivity, reduce training times, and minimize disruptions, all while fully capitalizing on their investments in mainframe infrastructure.



Overcoming misconceptions

Though often viewed as heritage systems, mainframes and COBOL remain vital to the operations of many organizations across various industries. A recent Vanson Bourne survey revealed that over 80% of respondents regard COBOL and mainframe applications as strategic to their business processes, with 72% believing their organizations will continue to rely on these systems for the foreseeable future. This highlights their enduring importance in the technology landscape.



Industry Challenge:

Despite their relevance, there exists a prevalent misconception of obsolescence surrounding mainframes and COBOL. This misunderstanding may discourage new talent from entering the field, resulting in a potential skills gap that could impact future innovation and maintenance of these crucial systems.



Solution:

To combat this challenge, it is essential to reposition mainframes and COBOL as cutting-edge technologies that are integral to the digital transformation journey. This can be achieved by showcasing the significant contributions these systems have made in enhancing business operations and improving efficiency. Highlighting success stories of companies that have successfully integrated mainframes with modern advancements, such as artificial intelligence and cloud technologies, can provide compelling evidence of their ongoing relevance. By demonstrating how these organizations have leveraged core systems to remain competitive in an ever-evolving market, organizations can attract and retain the skilled workforce necessary to maintain, innovate, and drive future growth in these technologies. This proactive approach not only preserves the value of mainframes and COBOL but also encourages a new generation of talent to embrace these powerful tools.

Understanding the landscape

The 2024 Vanson Bourne survey offers valuable insights into the modernization of mainframes and COBOL. Despite swift technological progress, 72% of organizations express a strong commitment to maintaining their mainframe systems in the near future. Furthermore, over 80% view these systems as essential to their daily operations, signaling a shift in focus from replacement to evolution.

Why modernize?

Modernization is crucial for maintaining competitive agility and operational efficiency. However, it comes with challenges. Organizations face resource constraints, skills gaps, and budget limitations, with 42% of respondents citing limited resources as a significant obstacle. Despite these challenges, 80% are actively modernizing, incorporating APIs, adopting modern development practices, and leveraging cloud capabilities.

Industry challenges and insights

Application modernization

Application modernization goes beyond simply keeping software up to date; it involves transforming systems to support digital business models. The survey indicates that 62% of organizations are integrating COBOL with APIs and web services, enabling real-time data access and collaboration. This integration is crucial for businesses transitioning to a digital-first approach, ensuring they meet customer expectations and regulatory requirements.

Mainframe and COBOL modernization

COBOL applications, often viewed as outdated in today's rapidly evolving technological landscape, are in fact strategic assets crucial to many organizations. A significant 85% of respondents affirm their ongoing relevance, underscoring the vital functions these applications continue to serve. To fully harness their potential, however, targeted modernization strategies are essential. Recent surveys reveal several effective approaches for this transition, including the adoption of modern programming languages, cloud migration, and the implementation of automated testing processes. By embracing these strategies, organizations can revitalize their COBOL systems, ensuring they meet contemporary business demands while capitalizing on existing capabilities.

- **Refactoring and reengineering:** 40% of organizations are refactoring their current COBOL applications to enhance efficiency and maintainability. This process entails restructuring code without altering its external behavior, facilitating improved performance and smoother integration with modern technologies.
- **Adopting modern tools:** New development tools are streamlining application updates and maintenance, with 38% of respondents leveraging these resources to accelerate agile development cycles.
- **Cloud integration:** Cloud migration is a prominent trend, with 52% planning to transition COBOL applications to the cloud. Hybrid models, which allow applications to operate both on-premises and in the cloud, provide the flexibility and scalability that align with business needs. A notable example is a major retailer's deployment on AWS, which enhanced scalability and resulted in \$4 million in annual savings.

Core apps and migration

Core applications often serve as the backbone of enterprise systems, yet they pose significant challenges regarding compatibility and scalability. Migrating from mainframe to cloud is a strategic initiative that offers numerous benefits:

- **Improved collaboration:** Modernized infrastructures promote collaboration among teams, boosting both productivity and innovation.
- **Enhanced security:** With security being a top concern, modernized systems incorporate advanced encryption and access controls, addressing the security enhancements identified by 70% of survey respondents.

Security concerns

Security remains a paramount priority, driving modernization efforts across organizations. A recent survey highlights that data privacy, stronger authentication, and encryption are critical components of these initiatives:

42% of organizations are intensifying their security measures, focusing particularly on access control and data privacy.

68% of respondents stress the importance of implementing robust multi-factor authentication protocols to safeguard against unauthorized access, reflecting their commitment to enhancing user verification processes.

64% underscore the crucial role of end-to-end data encryption in protecting information during transactions and communications, indicating a growing emphasis on maintaining data integrity and confidentiality amid rising cyber threats.

61% of organizations plan to adopt advanced threat detection and response strategies, showcasing a proactive approach to monitoring and addressing potential security breaches.

52% of organizations emphasize the importance of developing comprehensive strategies when planning upgrades. These strategies should enhance data protection, safeguard against cyber threats, and ensure compliance with regulatory standards.

Alongside the Vanson Bourne survey, the recent Foundry Survey titled "[Rethinking the Role of Mainframe Data in Enterprise AI and Analytics](#)," commissioned by Rocket Software, revealed that 56% of respondents identified security, compliance, and data privacy as significant barriers to effectively utilizing mainframe data.

In summary, the information illustrates a collective commitment among organizations to fortify their security frameworks, ensuring core systems are safeguarded against evolving cyber risks while complying with stringent regulatory requirements.

Host access and terminal emulation

The Vanson Bourne survey underscores the vital role of host access and terminal emulation in modernizing mainframe systems. As organizations seek to bridge the divide between heritage environments and contemporary technology solutions, host access tools provide a secure and efficient way for users to connect with mainframe data and applications. Meanwhile, terminal emulation software enables modern devices to replicate traditional mainframe terminal interfaces, facilitating seamless user interaction with these powerful systems.

According to the survey, **68% of organizations are embracing advanced terminal emulation techniques to enhance user experiences, simplify operations, and reduce training needs for staff.** This approach not only optimizes the value of existing mainframe investments but also aligns with broader modernization efforts by ensuring compatibility with new technologies and processes. By implementing these solutions, businesses can protect their critical operations while offering employees intuitive access to essential mainframe functionalities.

The role of hybrid cloud

Hybrid cloud models present a balanced approach, merging the strengths of mainframes with the flexibility of cloud solutions. Organizations can maintain essential applications on secure, reliable mainframes while utilizing the cloud for scalability and innovation. This approach is gaining momentum, with 40% of organizations already running applications in the cloud, with many more planning to transition additional applications there in the near future. This shift highlights the growing recognition of cloud benefits, such as scalability, cost-effectiveness, and enhanced performance.

Mainframes and COBOL systems must evolve to effectively support emerging technologies such as cloud computing and artificial intelligence (AI). This integration is not just a trend; it is essential for organizations looking to maintain a competitive edge in an increasingly digital landscape.

Embracing these new technologies enables businesses to implement hybrid cloud strategies that can optimize their operations and improve agility.

To navigate this transition smoothly, organizations should leverage generative AI (and related technologies, like Robotic Process Automation – RPA) to automate the tedious tasks of updates and maintenance. This approach not only reduces the burden on skilled personnel but also allows teams to focus on more strategic initiatives. By incorporating AI into their operations, organizations can streamline processes, enhance decision-making capabilities, and unlock new opportunities for innovation, ultimately positioning themselves for long-term success in a rapidly evolving technological environment.

Balancing modernization and budget constraints

Modernizing mainframe and COBOL systems is often viewed as a daunting challenge, with budget constraints serving as a significant barrier to progress. Many organizations are understandably hesitant to allocate resources to such undertakings, fearing the upfront costs involved in overhauling heritage systems. However, it's important to recognize that modernization is not merely an expense — it's a strategic investment in future resilience, agility, and competitiveness in an increasingly digital landscape.



Insight:

A recent survey revealed that while budget issues are a considerable concern for many, two-thirds of organizations are determined to move forward with their modernization efforts. This statistic highlights a growing awareness of the necessity of evolving technology to meet customer demands and business objectives.



Solution:

To effectively tackle the financial challenges associated with modernization, organizations should consider adopting innovative funding models. Options such as phased upgrades allow businesses to implement improvements incrementally, minimizing the immediate financial burden. Hybrid solutions, which combine cloud-based services with existing infrastructure, can also provide a balanced approach to modernization. Additionally, fostering collaboration with key stakeholders is essential in developing a comprehensive strategic roadmap. This roadmap should prioritize critical modernization projects, ensuring that short-term needs are met while aligning with long-term goals for success and sustainability. By embracing these strategies, organizations can navigate the complexities of modernization and position themselves for future growth.

IT modernization: insights from the Forrester Survey

In addition to the Vanson Bourne Survey, Rocket recently commissioned a Forrester survey titled "IT Modernization. Without Disruption". This survey highlights the importance of minimizing risk and disruption while promoting growth and innovation within organizations. Decision-makers are faced with the challenge of navigating a clear set of priorities to achieve these objectives. **Key findings from the survey include:**

75%

of respondents have identified enhancing customer experience as a top business goal for the upcoming year.

70%

plan to meet measurable commercial growth targets, improve their organization's innovation capabilities — especially in AI-driven functionalities — mitigate enterprise risk, and strengthen operational resilience.

69%

of respondents value IT modernization as key to driving transformation and vital to achieving business objectives over the next 12 months.

Among those pursuing IT modernization within mainframe environments, **various approaches are being adopted:**

69%

believe that IT modernization, supported by cloud technologies, is very or extremely important for achieving business objectives within the next 12 months.

56%

are modernizing mainframe applications and integrating them with replatformed or existing cloud-hosted applications.

51%

reported attempting six or more mainframe application rewrite projects as part of their cloud migration strategy, due to multiple failures.

These strategies reflect a comprehensive approach to transforming IT environments, ultimately facilitating broader business transformation.

Real-world success stories

A major retailer

The modernization efforts of a leading retailer highlight the significant benefits of strategic transformation. By leveraging Amazon® Web Services (AWS®), the company achieved:

- **Enhanced flexibility and scalability:** Cloud deployment enabled dynamic scaling to meet fluctuating demands seamlessly.
- **Advanced data analytics:** A consolidated data source facilitated comprehensive analytics, empowering informed decision-making.
- **Innovation-driven business models:** With a modern infrastructure, this retailer identified new market opportunities and optimized its operations.

Insurance company

A prominent life insurance company's modernization initiative illustrates the potential for increased productivity and cost savings. The key outcomes included:

- **30% boost in development productivity:** Improved tools and processes accelerated development cycles considerably.
- **DevOps readiness:** Modernized systems established a strong foundation for DevOps adoption, enabling continuous integration and delivery.
- **Enhanced product quality:** Streamlined processes resulted in higher-quality offerings, significantly improving customer satisfaction.

The path forward

Mainframe and COBOL modernization is not a one-size-fits-all initiative. Organizations must customize their strategies to meet their unique needs, taking into account factors such as budget, resources, and business objectives. Critical components of this process include host access and terminal emulation, which ensure seamless integration between heritage systems and modern applications. Achieving success requires a comprehensive approach that encompasses technology, processes, and people.

Strategic recommendations

01

Invest in skills development:

Bridge the skills gap by investing in training programs and talent acquisition. Equip your teams with the expertise necessary to propel modernization efforts forward.

02

Leverage cloud capabilities:

Consider hybrid cloud solutions to boost scalability and flexibility while keeping core applications on dependable mainframes.

03

Enhance security measures:

Make security enhancements a priority by focusing on data privacy, access control, and encryption. Conduct regular audits to ensure compliance with evolving standards.

04

Adopt agile practices:

Embrace agile methodologies to accelerate development cycles and swiftly respond to changing business needs.

The future of mainframe and COBOL

Looking ahead, mainframes and COBOL will continue to play a crucial role in facilitating hybrid cloud strategies and supporting digital transformation initiatives across various industries. These robust systems have proven their reliability and capability over decades and will remain integral as organizations seek to modernize their operations. By integrating these established technologies with modern solutions, businesses can achieve enhanced flexibility, scalability, and efficiency, allowing them to respond swiftly to market demands and customer needs.

Prediction:

As organizations strive to balance their traditional strengths with innovative capabilities, the significance of mainframes and COBOL will only continue to grow. Many companies are realizing that leveraging the full potential of these powerful systems can lead to significant operational improvements. This integration not only supports heritage applications but also enables the development of new digital services that enhance customer experience. By harnessing the strengths of mainframes and COBOL in conjunction with cutting-edge cloud technologies, businesses will be better positioned to gain a competitive edge in a rapidly evolving landscape, ultimately driving growth and innovation in their sectors.

Building a strategic roadmap

A successful modernization strategy necessitates a holistic approach that thoroughly addresses critical components such as talent, technology, and security. This comprehensive method ensures that every aspect of the organization is considered, leading to a more effective transformation. Developing a clear and detailed roadmap is crucial for navigating the complexities associated with this process, as it provides a structured guide to follow.

Tip: To enhance the effectiveness of your planning, involve key stakeholders from various departments, including IT, HR, and finance. This collaboration is vital to ensure alignment and garner necessary support across the organization. It encourages diverse perspectives and insights, ultimately strengthening the strategy. Additionally, it's important to regularly review and update the roadmap to adapt to shifting priorities and evolving market conditions, ensuring that your strategy remains relevant and effective in a fast-paced environment. By staying proactive, organizations can better position themselves for sustained success in their modernization efforts.

Conclusion

In today's dynamic business environment, mainframe and COBOL modernization is not merely a trend; it is a strategic necessity that organizations cannot afford to overlook. As industries face mounting pressures to innovate and stay competitive, transitioning from heritage systems to modern solutions becomes imperative. By tackling the unique challenges associated with outdated technologies and leveraging insights from industry experts, organizations can unlock new avenues for growth and efficiency, positioning themselves for long-term success in a rapidly changing marketplace.

Are you prepared to take the next step toward modernization? Discover the benefits of mainframe and COBOL modernization, as well as the critical role of host access in facilitating seamless transitions. Learn how our tailored solutions can empower your organization to not only survive but thrive in the digital age, optimizing operations and enhancing customer experiences.

Contact us today to explore how we can support your modernization journey. Together, we can shape the future of enterprise computing, ensuring that your organization remains at the forefront of innovation and agility in an ever-evolving technological landscape. Your path to future success begins with the right steps today.

Next steps

Take the next steps toward unlocking mainframe agility and driving digital transformation for your organization:

Contact us: Your modernization initiatives become our experts' priority as we together explore the tailored solutions that meet your unique needs.

[Contact us](#)

Download our Modernization Maturity Model: Your comprehensive guide to valuable insights into the modernization process. This resource will provide you with a roadmap for success and help you navigate the complexities of modernizing mainframe applications.

[Download](#)

Together, we'll roadmap your organization's journey toward future successes, ensuring that you remain at the forefront of innovation and agility despite ever-evolving landscapes. **Start today!**

About Rocket Software

Rocket Software is the global technology leader in modernization and partner of choice that empowers the world's leading businesses on their modernization journeys, spanning core systems to the cloud. Trusted by over 12,500 customers and 750 partners, and with more than 3,000 global employees, Rocket Software enables customers to maximize their data, applications, and infrastructure to deliver critical services that power our modern world. Rocket Software is a privately held U.S. corporation headquartered in the Boston area with centers of excellence strategically located around the world. Rocket Software is a portfolio company of Bain Capital Private Equity. Follow Rocket Software on [LinkedIn](#) and [X \(formerly Twitter\)](#) or visit RocketSoftware.com to learn more.

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