MAINFRAME MARKETS IN 2021

CYBER THEORY

RESEARCH REPORT

A CyberTheory Research Report: Mainframe Markets in 2021

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Background

With the BMC acquisition of Compuware in March of this year (2020), consolidation in the mainframe software business continued.

Seeking a stronger position in the mainframe application development, delivery and technical support markets, each company agreed that by building on BMC's Automated Mainframe Intelligence (AMI) offerings with Compuware's Topaz suite and ISPW technology, they would be able to modernize mainframe applications and create usable development tools for the emerging DevOps market.

The market target is clear as cybersecurity, data management and storage are the levers that large corporate IT shops will continue to use in order to transform their proprietary mainframe environments into cloud and open source environments in the future.

Entering the fray however, Broadcom, who had acquired CA Technologies in 2018 with exactly the same strategy, is the third and only other viable competitor in the Mainframe space.

Broadcom is a chip company, so a large acquisition of a software company raised some investor eyebrows, especially since the CA market focus is largely on mainframe software which is a low growth segment.

CA's mainframe-related revenue, which represents more than half of their total revenue, actually declined by 1% in fiscal 2018.

On the other hand, the mainframe software business is a cash cow. In 2018, CA enjoyed an operating margin of 64% in that segment compared to their enterprise solutions and services offerings which reported thin margins of 9% and 3%, respectively. The persistence of mainframe systems, makes selling supporting software a lucrative business model.

In addition, CA seems to be uniquely positioned across a fragmented infrastructure software market, and CA's mainframe and enterprise software in particular are rapidly feeding a growing demand for infrastructure software.

As illustration, CA produced free cash flow of $1.15 billion in fiscal 2018, which translated to enterprise value of around $18.4 billion, not bad for a company trying to sustain double-digit growth.

This growth maps to Forrester Research reports that suggest mainframe use is on the rise, and in addition, over 50% of enterprise computing continues to depend on legacy systems that run on mainframes.

While IBM used to be the logical acquirer for companies like BMC and Compuware, their pivot under Ginni Rometty's leadership to open source eliminated a reliable exit strategy for several mainframe ISVs.

Forrester Research reports that mainframe use is on the rise, as 56% of surveyed enterprises continue to rely on these legacy systems.

The survey found that 48% of mainframes were being used for Enterprise Resource Planning (ERP), i.e., the integrated management of main business processes, mediated by software and technology. Meanwhile 45% were used for accounting and 44% for HR management. Finally, 43% were used for Enterprise Content Management (ECM), i.e., a set of defined processes, strategies and tools that allow a business to effectively obtain, organize, store and deliver critical information to its employees, business stakeholders and customers.

The survey also found that a quarter of the sites are using their mainframes for mobile sites and applications. And 27% of the sites surveyed are using their mainframes for new blockchain initiatives and containerized applications.

Interesting statistics about mainframes include the fact that mainframes handle 68% of the world's production application workloads, yet they account for only 6% of IT costs, and 71% of Fortune 500 companies use mainframes.

Today, a single high-end mainframe can process up to 30 billion transactions daily. Unsurprisingly, the mainframe remains the backbone of 92 of the world's 100 biggest banks.

A recent report by Allied Market Research finds that industries such as banking, retail and healthcare continue to rely on mainframe computing power to manage hundreds of applications processing large volumes of data to simultaneously serve hundreds of thousands of users, and this trend will drive the mainframe market, now estimated to reach $2.9 billion by 2025.

As we head into 2021, there remain three mainframe software market leaders – IBM, Broadcom and BMC.

IBM

2020 will be a growth year for IBM; this is owed largely to the acquisition of software company Red Hat and the announcement of availability for a new mainframe system. The forecast is for revenue, adjusted earnings per share and free cash flow rising through year-end.

IBM's fourth-quarter report beat expectations across the board, and their revenue increase and bottom line exceeded analysts' projections as well.

In general terms, IBM's revenue has been shrinking over the past six years but a combination of negative currency and divestitures has somewhat diluted the negative effects.

z15 Mainframe Hardware

The good news is that in the systems segment, IBM's new z15 mainframe seriously over performed. These systems drove mainframe revenue soaring to 63% year over year, and cloud revenue, spanning all of IBM's segments, grew 23% a during the fourth quarter as well. For 2020, cloud has generated $21 billion thus far and Red Hat grew its own normalized revenue by 24% in the fourth quarter.

Acquiring Red Hat seriously strengthened IBM's position in the hybrid cloud market and validated Rometty’s market prediction. In addition, IBM can accelerate Red Hat's growth by selling its software to large IBM customers who have had no exposure to Red Hat, and it can also increase sales of its own legacy software reengineered to run on Red Hat's platforms.

Red Hat Influence

IBM's apparent strategy is to dominate the market for artificial intelligence (AI) and hybrid cloud infrastructure by focusing on client requirements and becoming more aggressive about leveraging their competitive advantage.

One path toward that goal is to leverage its investment in Red Hat and to establish Linux, containers and Kubernetes as the new standard, by making Red Hat's OpenShift the default choice for hybrid cloud.

VMware, which recently released vSphere 7, has upgraded its virtualization platform with Kubernetes capabilities and will present a strong competitive position that will be difficult to overcome.

IBM is a leading competitor across four emerging technology fronts that include cloud, AI, blockchain and quantum, but badly needs fresh leadership in key roles.

Besides external market challenges, IBM is burdened with a bloated workforce, a cumbersome org chart and some historic misguided reliance on legacy businesses as the market entry into cloud.

If Red Hat couldn't scale on its own, it is not clear how the product and solution suite will fare under IBM's guidance, integration and management.

Financial Performance

IBM began a dramatic multiyear restructuring that accelerated in October. They announced plans to spin off a $19 billion technology consulting business so they can focus more intently on cloud computing and artificial intelligence.

The markets rewarded IBM as its stock jumped 6% on the announcement, which was a six-month high.

The business unit, called Managed Infrastructure Services (MIS), will be spun off into a new public company. IBM envisions a tax-free deal completed by the end of next year. MIS will focus on managing and modernizing client-owned infrastructures, a skill in which IBM has creds, and it will provide hosting and network services, infrastructure modernization and cloud migration services.

It is seen as a $500 billion market opportunity.

Another part of the multiyear transformation is developing and expanding an open hybrid cloud platform.

A hybrid cloud architecture translates to providing its customers with both a public cloud and a private cloud, which gives a company extra network security and the ability to share data and applications between them.

Sounds good but hard to execute.

Over the last 10 years, IBM has invested $140 billion+ in remaking the company, including capital expenditures for scaling its cloud operations and artificial intelligence offerings and enhancing its security and services capabilities.

The single business initiative that could be the growth platform is the revived Cloud and Cognitive Software business unit. It provides a variety of cloud computing services, data and transaction processing platforms, and cognitive applications, aka, artificial intelligence.

While it is true that the market applies a 2.5x value factor to a hybrid cloud approach versus public only, the opportunity value of $1 trillion may be elusive for a market leader who relies on an open-source software acquisition to get them there.

These major shifts in business operations explain the tepid growth in revenue and earnings performance. In the past 5 years, revenue in 13 quarters showed declines from the year-ago period, with earnings collaterally weak along the way.

IBM reported third-quarter results in October that had adjusted earnings of $2.58 per share, down 4% while revenue fell 2.6% to $17.6 million.

The one bright spot was total cloud revenue which climbed 19% to $6 billion.

IBM ended the third quarter of 2020 with $15.8 billion of cash on hand, which is up $6.7 billion from the end of 2019. In addition, IBM continues its popularity among long-term investors as a top dividend stock, returning more than $97 billion to shareholders in the last eight years.

With new leadership, IBM may succeed at getting out of its own way. But it will require bold moves in reducing the size of the workforce, flattening a classically

hierarchical organizational structure, and leveraging the company's substantial strengths.

2021 will provide many clues as to whether these moves are possible and whether with new leadership, IBM can manage through the shoals.

Net outlook: Cautiously Neutral.

Broadcom

Any review of Broadcom must include its two most significant acquisitions of CA in 2018 and the Symantec Enterprise business in late 2019. Part of the latter move was to fold the former CA Security business unit into what is now the Symantec Enterprise Division of Broadcom.

IAM

Broadcom's Symantec Enterprise portfolio includes Symantec Identity Governance and Administration (IGA), which consists of Identity Manager, Identity Governance and the Identity Portal.

Today, Broadcom's IGA represents a well-integrated platform providing the range of Access Governance features to be expected from an established market player.

Leveraging the Symantec portfolio of security products, Broadcom has delivered several large deployments of IGA globally, offering a strong line-up of Access Governance capabilities including an access certification and risk analyzer & simulator that can estimate a user's risk score based on the change in context of a particular access request.

PAM

The Broadcom IGA also offers a connector to their Privileged Access Manager for provisioning/de-provisioning PAM user accounts.

The product suite is complex and powerful, resulting in some deployment and configuration challenges, so Broadcom provides substantial role management support yet, missing are some extended capabilities such as access modeling, anomaly and role outlier detection.

User activity monitoring (UAM) is supported, but requires the addition of the PAM solution. Broadcom also supports cloud and hybrid scenarios through the use of virtual appliances, in addition to traditional on-prem installs.

Overall, Broadcom's IGA solution is a mature and feature-rich product, suitable for large, complex Access Governance deployments. Broadcom's global presence

is substantial, but we found that they were below par on specialized integration partners as compared to other global IAM suite vendors.

Broadcom's wide-ranging suite of software solutions in the mainframe IT sector position the company as a market leader into 2021 and beyond.

Connectivity Advantage

Broadcom is a leading provider of data center solutions with a strong portfolio of network, server and storage connectivity. Broadcom's differentiated and innovative solutions capably address the needs of modern large-scale data centers and massively data-driven networks.

Broadcom enjoys an industry-leading market position in innovative fiber optics and ASIC/ASSP solutions for wired infrastructure and networking, addressing broadband internet access, data center and enterprise networking, network switch and router, and fiber optic telecommunications such as optical access, metro networking and long-haul data communications.

Enterprise Security

In security solutions, Broadcom is uniquely positioned via their expertise as a hardware company for both hardware and software security.

Broadcom offers a broad portfolio of embedded security solutions, mainframe security and payment authentication software, and a best-in-class suite of integrated Symantec cyber security software. Security solutions from Broadcom are widely deployed and used in networks across the globe.

Dis-assembling the Symantec acquisition and selling off the services unit to Accenture only months after purchasing the whole portfolio, speaks volumes to Broadcom's intent to stay focused on the security software side of the business.

IT Ops

Included in their portfolio are AIOps, DevOps and ValueOps solutions that deliver a dev framework providing continuous feedback loops that align IT outputs to business outcomes. Powered by their Automation.ai software intelligence

platform, Broadcom can transform massive volumes of enterprise data from disparate toolsets into actionable insights.

This capability is important to the growing fields of AppSec and DevSecOps, where their solution offers full-stack observability across app infra and network, advanced analytics and intelligence that spotlights threats before they become corrosive in the environment.

Hardware Influence

A full suite of hardware wireline solutions addresses challenges across various levels of the network infrastructure with a broad portfolio of fiber optics and chip solutions. Their storage connectivity solutions help maximize server speed and uptime, and provide foundational technologies that enable hyperscale data centers.

Because Broadcom can boast capabilities in both software and silicon, they are well positioned to leverage that story in the mainframe security solutions space and in integrated detection and prevention strategies as well.

Their enterprise storage solutions provide connectivity, scalability, performance and manageability that scales across large data-intensive applications regardless of where they reside and as such can form integrated leadership themes in the global mainframe security markets.

Positioning for IoT, Broadcom offers security solutions that address both current and emerging technical challenges of numerous industrial markets. Ranging from high voltage protection and signal isolation to reliable fiber optic data transmission, robust Ethernet connectivity, high brightness lighting and precision motion control, Broadcom can position as market leaders in automotive, factory automation, power generation and alternative energy systems, and displays.

And finally, in mobile, Broadcom's innovative and market-leading communication solutions are enabling next-generation, 5G and 6G mobile devices, cellular networks, and integrated data center solutions with layers of security identity detection, prevention and response management.

Financial Performance.

From a fiscal performance view, Broadcom's Q3 results beat Wall Street's targets and guided higher for the Q4.

On a year-over-year basis, Broadcom earnings rose 5% while sales climbed 6%.

Fundamentally, the company boasts a steady track record of earnings growth, resulting in an 86 (out of a best-possible 99) EPS Rating. The company has earned the highest-possible SMR Rating of A. The SMR Rating checks under the hood at a company's sales, margins and return on equity metrics that co-indicate long term stability and future promise.

Broadcom's network hardware business paired with its more-recently purchased (and high-profit margin) network management software continues to benefit from the growth of the cloud. With cloud computing expansion expected to continue at scale for the foreseeable future, Broadcom's slow-and-steady trajectory along with its comprehensive solution suite looks promising.

Net outlook: Bright.

BMC

Capitalizing on the trend toward digitization, BMC positions itself as the leader in core to cloud to edge transformation, enabling over 10,000 global customers – including 84% of the Forbes Global 100 – to thrive in their ongoing evolution to a (branded) Autonomous Digital Enterprise.

But an analysis of their current solution suite paints a slightly different story.

The source of one of BMC's current mainframe market focus is MainView, a product that was created by Boole & Babbage in 1990 so that companies would be able to automate their data management systems on IBM mainframes and control that automation within each enterprise.

Following the acquisition of Boole & Babbage in 1998, BMC continued to upgrade MainView to be compatible with new technologies and now has over 300 customers using it for systems management automation and complex

performance issues around monitoring, automation and storage management faced by mainframe cohorts and technical staff.

Systems Management

BMC has captured a small share of a giant market consisting of 189 products and over 274,000 customers. BMC competes with market leaders like Intermedia (13.32%), Nagios (11.11%), the Microsoft System Center Configuration Manager (5.97%) and ServiceNow who claims just under 5% of market share.

In spite of the noise and competition, BMC's product suite has a comprehensive offering set supporting IMS, CICS +, DB2, SRM, Middle-ware and multiple, popular flavors of Unix and zOS. This should be an attractive integration opportunity for any large mainframe operation supporting legacy systems and current operating systems in parallel.

Another key positioning in the mainframe space is their emphasis on BMC AMI solutions which leverage AI, machine learning and predictive analytics to achieve a self-managing mainframe.

Mainframe Modernization

Drawing upon the popularity of the mainframe modernization movement, BMC comes to market with an integrated platform that uses multivariate analysis which they apply simultaneously across multiple data sources to track anomalies and threats.

It is supplemented by predictive analytics that use pattern analysis algorithms that can detect and identify anomalies and analyze their impact with ML root-cause analysis that reveals problem determination and prescribed remediation.

The foundational intelligent automation maintains a secure and efficient computing environment with built-in domain expertize that helps data center managers track KPIs without human resources, which are scarce.

While BMC began life as a mainframe-only software vendor, they have been steadily developing software to monitor, manage and automate both distributed and mainframe systems since the 1990's.

AI and ML

The company's specialty is enterprise software and IT service management, data center automation, performance management, virtualization lifecycle management and cloud computing.

BMC continues to support enterprises using modern mainframes through automated intelligence, their proprietary process that creates self-managing mainframe systems. These use machine learning to anticipate needs, firing of alarms and execution of standard workflows without the need for IT intervention.

Control-M

BMC's current mainframe market strength is found in their software platform known as Control-M, which enables data center teams to run hundreds of thousands of batch jobs daily through a single user interface, integrating with several distributed storage systems placing the company in a leadership role relative to work automation.

Control-M possesses ITSM and ITOM capabilities that integrate AI to provide predictive IT service and management tools and is available as a Docker container enabling easy cloud deployment. This capability has given BMC the clout to attract major logos like AAA, Chase Bank and Lockheed Martin.

Another market strength is their Helix Discovery suite which provides enterprises with a single view of all IT assets across their entire attack surface while automatically discovering inventory wherever assets may reside.

Additionally, their operations management platform (TrueSight) leverages AI and machine learning to provide insights and network automation capabilities in large storage network and mainframe environments.

Financial Performance

BMC's acquisition of Compuware adds a complimentary set of mainframe software tools, strengthening BMC's mainframe software position versus industry leaders, IBM and Broadcom. Though the combined companies will face headwinds driven by the COVID-19 outbreak, BMC is entering peak renewal years

which should result in moderate overall growth in fiscal 2021 and 2022 (FYE March 31).

Moody's expects leverage to improve towards 7x over the next 18 months based on EBITDA growth as BMC enters the peak of its renewal cycle and the economy gradually recovers. FY 2020 (FYE March 31) was a trough year in BMC's renewal cycle.

Moody's credit profile reflects BMC's very high leverage as a result of the KKR buyout and Compuware acquisition, and aggressive financial policies. It also considers the strength of BMC's market position as a leading independent provider of IT systems management software solutions, the resiliency of its high-margin mainframe software business and resultant cash generating capabilities.

BMC's mainframe business is estimated to generate close to half of the company's operating profit and cash flow, but it has limited growth prospects as a mature business.

BMC's revenues and free cash can swing dramatically based on choppy renewal cycles yielding free cash flow to debt levels between 0% and 5%.

The financial market expects flat to modest medium term growth, with revenue and EBITDA performance expected to demonstrate much higher volatility amid the challenges of navigating an evolving IT management market while continually restructuring the business. The IT management software industry is presently evolving to adapt to the growing complexity of cloud and hybrid-cloud based IT environments.

The established players in the space along with BMC, Broadcom, IBM and Hewlett Packard Enterprise face tough competition from fast growing cloud players such as ServiceNow. While the markets view the BMC product portfolio as stronger than it was at the time of the KKR buyout, BMC needs to continually introduce new products and features or risk continual declines in market share.

Investor expectation is that BMC's operating performance will improve over the next two years, in line with previous renewal cycles. The outlook accommodates typical cyclicality in revenues, EBITDA and free cash flow tied to peaks and troughs of the renewal cycle.

BMC's liquidity is stable based on a $475 million undrawn revolver and investor expectation of over $250 million of free cash flow into 2022.

The rapid and widening spread of the coronavirus outbreak, along with a deteriorating global economic outlook have combined to push asset price declines and a severe and unprecedented credit shock across many sectors, regions and markets.

BMC's weal credit profile, along with its very high leverage and exposure to global economies have left it vulnerable to even minor shifts in market sentiment. And the vulnerability will continue to increase as the market uncertainty expands.

Net outlook: Level Moderate.

Cloud Markets

IBM, Broadcom and BMC have all taken various positions, from ITSM, to Mainframe modernization, to Connectivity, to IAM. And they all compete in cloud computing as well, appealing to buyers who want a strong, proven and steady integrated multi-cloud capability that can manage their complete mainframe security and processing requirements.

Because cloud computing technology is rapidly becoming normalized with cloud solutions and services growing in a non-linear fashion, it may be the one space wherein we can compare growth opportunities for all three companies.

Cloud computing has reduced the need for enterprises to invest in their own physical IT infrastructure and is forecast to continue growth at a torrid 39% CAGR through 2025. According to a recent Cloud Computing Survey by the Cloud Security Alliance, 69% of the world's enterprises are migrating business-critical applications to the cloud.

Among the many factors that compel business organizations to move their applications and operations to the cloud are significant financial savings.

The cloud allows for more flexibility, especially for companies with fluctuating bandwidth requirements. And with the introduction of modern cloud system management software, enterprises are empowered to manage cloud-based security, operations, resources, data hubs and storage all from a single unified interface.

The benefits include improved staff efficiency, ease of deployment, higher responsiveness to end-users, optimized resource utilization, reduced maintenance cost and increased operational quality.

Comprehensive Monitoring

All three of these market leaders provide a fully comprehensive cloud management platform that includes resource usage monitors that help clients track the number of resources and data they are using and automate the handling of system failures along with capabilities like self-monitoring, notification mechanisms and failure & self-healing automation.

Based on current statistics, we see a massive adoption movement and rapid implementation of multi-cloud strategies in the near-term future.

It turns out, however, that multi-cloud deployment presents a number of challenges, primarily in monitoring. Therefore, customers will be looking to vendors who offer comprehensive and effective management of multiple cloud environments through a single portal for hybrid cloud visibility.

IBM's z15 platform provides a single view of data privacy controls, enterprise security results and cyber resiliency capabilities into their hybrid cloud environment with their Cloud Pak solution on VMware virtualized infrastructure.

BMC's Helix Discovery provides visibility into hybrid assets and dependencies across multi-cloud environments and touts automatic dependency mapping for seamless inventory, security, migration and change management.

Broadcom's approach has been through the Symantec CWP (Cloud Workload Protection) which enables customers to discover and secure workloads across multi-cloud environments like AWS, Azure and Google Cloud Platform (GCP). Auto-discovery of software services on workloads and auto-identification of workload security posture provides real-time visibility into infrastructure changes through a single intuitive platform.

Multi-Cloud

According to the Flexera 2020 State of the Cloud Report, 93% of enterprises have a multi-cloud strategy, 87% have a hybrid cloud strategy, and in addition, 59% of enterprises expect cloud usage to exceed plans that were in place prior to the COVID-19 outbreak.

COVID-19 has had the most significant impact by imposing huge restrictions for continued use of on-premises IT systems; and has driven many businesses to a rapid multi-cloud migration. Microsoft reports that post-pandemic, the company has seen a 775% increase in demand for cloud services.

In addition, a large number of small, medium and mid-enterprise businesses are now introducing their own cloud frameworks to securely cater to their internal computing and data storage and processing requirements.

All of these market factors give rise to the demand for advanced cloud systems management software products. And businesses are seeking efficient solutions that enhance the quality and speed of delivery, reduce the cost of manual tasks, and improve business performance and accuracy.

Additional enhancements driven by market demand over the past 3 years have led to a massive increase in the number of customized services and applications, requiring effective management tools from cloud software vendors to assure positive results.

Small to Mid-Enterprise

According to Parallels, the size of small-to-medium-sized business cloud services were valued at $158.9 billion in 2019, a 25% increase over the prior year. The growth in the adoption of multiple cloud services among SMEs alone will be strong enough to drive 16% CAGR through the next 4 years alone.

The top cloud challenges from this sector will include a severe lack of trained and qualified resources; inability to govern amid shifting regulatory pressures; increased complexity in security, compliance, and in the management of cloud spend; and shadow IT instances throughout the enterprise.

Cloud management software that supports the facilitation of security audits, compliance management, disaster recovery and contingency planning will become indispensable, given that the average enterprise uses over 1,400 distinct cloud services, 6 different file-sharing cloud services and 210 distinct collaboration cloud services.

Competitive Landscape and Takeaways

The Cloud System Management Software market is broadly fragmented with at least a dozen major players following leaders like IBM Corporation, BMC Software and Broadcom.

VMware, Inc., the HP Development Company, Cisco Systems, Microsoft and Oracle are all serious contenders. Those who continue to innovate within cloud systems management and are able to deliver customized computing solutions will strengthen their market positions.

VMware announced earlier this year the availability of their Vmware vRealize Operations Cloud, which joins the self-managed operations space and is now delivered as a SaaS solution. The service enables consistent operations for the VMware hybrid cloud, helping customers enhance operational agility, scale rapidly, speed innovation and increase flexibility.

Last year, IBM announced that it had transformed its software portfolio to be cloud-native and optimized it to run on Red Hat OpenShift. Clients can build mission-critical applications once and run them on all public clouds, including AWS, Microsoft Azure, Google Cloud Platform, Alibaba and IBM Cloud, and on private clouds as well. These new cloud-native capabilities come as pre-integrated solutions called IBM Cloud Paks. Cloud Pak for Multicloud Management enables multi-cloud visibility, governance and automation, and can help clients reduce operational expenses of supporting large-scale cloud-native environments by as much as 75%.

Broadcom just announced the availability of their latest generation of AIOps, an open platform with artificial intelligence, machine learning and end-to-end observability that helps organizations achieve operational excellence. AIOps allows business and IT leaders to manage critical KPIs that align IT outputs to business outcomes, driving digital agility, while proactively ensuring enhanced customer and positive employee experiences. It provides enterprises with comprehensive observability across user experience, applications, infrastructure and networks delivering digital agility, actionable insights and intelligent automation, all enhancing business outcomes and customer experience.

BMC, in October, announced general availability of their Helix Control-M, a SaaS application workflow orchestration solution built on their Control-M product. The new SaaS offering provides a highly accessible, end-to-end, single view orchestration platform for application, file transfer and data pipeline workflows. It delivers a self-service automation experience for greater business agility and speed with integrated, deep production operations and governance capabilities. Along with recent innovations across the BMC portfolio, BMC Helix Control-M serves as the technology foundation for every Autonomous Digital Enterprise (ADE).

It's Not Just Hardware and Software

With the mainframe software market growing at the rate it is, we will see three key mainframe computing trends continuing to develop in 2021:

- The need for maintaining availability for critical workloads,
- The challenge of dealing with talent attrition and skills gaps,
- The demand for auto-assistance in managing complex environments.

At large mainframe installations, mission-critical workloads demand five-nine availability, so even a brief period of unplanned downtime can result in negative consequences for clients, employees, brand reputation and bottom line.

Optimized availability requires planned maintenance strategies and considers factors such as application and system interoperability, pervasive problem handling and managing changes when problems occur.

When considering how to minimize the risks of unplanned downtime, these companies will look for a provider who employs proactive planned maintenance to help reduce the possibility of an unexpected outage and one that has a track record of managing requirements of specific industries like banking and finance, which puts a premium on uptime and planned maintenance strategies.

A 2020 Allied Market Research report cites a survey that found 85% of respondents confirmed the existence of a critical mainframe skills gap, and 18% of current mainframe staff planned to retire within five years.

Many enterprises have started addressing their skills gaps, but the training roadmap is a minimum of two to three years.

Along with internal training programs, mainframe customers will seek providers for education resources that can deliver coursework for large systems mainframe and industry best practices as well as providers of technical support who can help fill talent gaps with skilled technical experts who can act as an extension to the customer's IT teams.

A large retailer can have multiple data centers, thousands of store locations, online shoppers and business operations, all of which are reliant on the mainframe. Every system needs to stay current with the latest level of fixes and collateral impacts because of complex interoperability implications.

An IDC study found remote access to updates and technical expertise and communication topped the lists of mainframe data center support needs.

Mature vendors who can offer mainframe hardware and software knowledge, resourcing and tools that can help enterprises navigate complex environments across multiple locations and provide proactive support for high availability, will dominate this segment over the next 5 years.

CYBER THEORY

We are a full-service cybersecurity marketing advisory firm. We constantly collect and analyze the latest customer data segmented by security practitioner, industry, and region. Our extensive knowledge model allows us personalized targeting of each and every cybersecurity buyer persona.With strategic insights from global education services, media providers, intelligence analysts, journalists, and executive leaders, we're always adapting to the latest industry trends. Our network of relationships encompass all aspects of cybersecurity as well as the related fields of fraud, audit, compliance, and risk management.

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