ISG Provider Lens™

Mainframe Services & Solutions

Mainframe Transformation Services

U.S. 2021

Quadrant Report

A research report comparing provider strengths, challenges and competitive differentiators

Customized report courtesy of:

HCL

April 2021

About this Report

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The research and analysis presented in this report includes research from the ISG Provider Lens™ program, ongoing ISG Research programs, interviews with ISG advisors, briefings with services providers, and analysis of publicly available market information from multiple sources. The data collected for this report represents information that ISG believes to be current as of February 2021, for providers who actively participated as well as for providers who did not. ISG recognizes that many mergers and acquisitions have taken place since that time, but those changes are not reflected in this report.

All revenue references are in U.S. dollars ($US) unless noted.

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ISG Provider Lens™

ISG Provider Lens™

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EXECUTIVE SUMMARY

This is the first time ISG Provider Lens™ studies have included mainframe modernization. It is a response to buyers' requests for advice on what to do with their mainframes. This research qualified 47 vendors and service providers in five quadrants. According to these companies, the mainframe modernization market has been accelerating in the last two years, driven by the need to increase business agility.

In the preparation phase for this study, we found a lot of articles speculating about what a CIO should do with the mainframes. Common questions include: How should they include the mainframe in their cloud strategies? As COBOL programmers are getting close to retirement, what are the risks of facing a skill shortage?

In this report, clients will find five alternatives represented in each quadrant. Mainframe modernization considers the choice of introducing agility into legacy mainframe applications. Mainframe transformation deals with options to move all applications off the mainframe. Mainframe-as-a-Service (MFaaS) supplements the modernization path, providing a pay-as-you-go (PAYG) business model. Those that do not plan to modernize consider outsourcing mainframe operations. These four quadrants help clients find the right service provider that can deliver to their needs. The fifth quadrant provides clients with modernization tool options for those that prefer to run modernization projects themselves.

A CIO should reflect on the real issue before figuring out if there is a need to modernize or change the mainframe. Setting a short timeframe (12 to 18 months) is imperative to guide reasoning in this case. More than 24 months would lead to a bias in favor of long application modernizations, which are not recommended. Decision-makers will find more details about the key topics that follow.

Mainframe legacy applications are dead: IBM Z platform has a future running z/OS, Linux, and other operating systems. However, for enterprise clients, the future of the hardware is irrelevant. Business applications are what is important. COBOL, Assembler, PL1, Natural, and other legacy programming languages are procedural and outdated. Modern applications are built on object-oriented programming languages such as Java, .NET, and C#. Investing in modernizing the toolset for agility will bring more significant benefits in the long run.

The top 100 have mainframes: According to IBM, "92 of the world's top 100 banks, 23 of the 25 top U.S. retailers, and nine out of 10 of the world's largest insurance companies run System z mainframe. Nine out of the top 10 global life and health insurance providers use a System z mainframe. And 71 percent of global Fortune 500 companies are System z clients." These facts do not suggest that enterprises should be writing new COBOL applications.

Optimizing the mainframe: Clients have several tools to optimize their mainframes. Providers of MFaaS and mainframe modernization can bring 10 to 25 percent cost savings while transitioning services. They check configurations, software licenses, and dead code that may waste mainframe resources. Also, competitive bidding processes have historically helped reduce cost.

Modernizing the mainframe: The most frequently used method is encapsulating batch and business functions into microservices that can run directly in the cloud. Application programming interfaces (APIs) that expose business function or mainframe data to other applications are always cited as part of the modernization. When the intention is to decommission the mainframe, modernization results in moving all applications to the cloud (or replatforming). Two methods that are prevalent include emulators, which enable COBOL to run in the cloud, and COBOL code compiled to Java or .NET to run in the cloud.

Re-engineering applications off the mainframe: A method that is gaining momentum is automated application re-engineering. Tools are fast, reliable, and produce quality code. Recent advances in methods and technology include artificial intelligence (AI), programming frameworks, code quality inspection, and automated testing. In the past, these tools required expensive on-premises processing power; however, at present, these tools run in the cloud with an increased processing capacity at much lower costs as well as much lower risks. Re-engineering of applications is viable and cost-effective.

Re-engineering: Most case studies cover less than 5 million lines of code converted to Java. Other languages include .NET and C#. Re-engineering is completed in a few months. The largest case study was 20 million lines of code converted in 20 months. Automated re-engineering can convert 2 million lines of code in one hour. Most of the project duration is spent on testing and quality assurance.

Converting COBOL to Java: Direct conversion does not include re-engineering. Data and logic stay the same, and the new code behaves the same as the old code. These conversion tools handle COBOL and many legacy languages and write modern code where Java is the most popular language. Converting code is much faster than re-engineering but also involves many testing cycles. These automation tools can convert 28 million lines of code in one hour.

Emulators: Replatforming and moving applications to x86 servers from mainframes have long been a possibility. The recent development observed is cloud virtual machines have increased the capacity of each x86 server, and the virtual servers can scale horizontally (many server images install within minutes). Cloud capacity and improved emulation technologies enable workloads of more than 100,000 MIPS to run in the cloud.

The database and storage myth: Mainframes hold vast amounts of data, which suggests that mainframe databases cannot go into the cloud. However, none of the participants in this survey mention issues associated with database size or storage complexity. Cloud data lakes are popular alternatives for storage, flat files, and virtual tape backup. Service providers are unanimous in converting legacy databases to any relational database with automated tools. The most popular choice to replace IBM DB2 is the open-source PostgreSQL.

The performance myth: Mainframes scale vertically, by adding more disk, CPU, and memory. The cloud scales horizontally, adding more servers of the same capacity. Any of the methods for replatforming mainframes to the cloud offer the same performance, or better, because of horizontal scaling.

The skill shortage myth: Service providers have demonstrated they can attract and train young talents to work on mainframes. The assessed providers employ more than 170,000 mainframe programming experts, including 60,000 COBOL programmers. In operations, more than 53,000 experts keep mainframes running. They have five years of experience on average. Only 6 percent of the mainframe operators have more than 14 years of experience. However, these numbers need to be put in perspective. COBOL skills are just as rare as SAP. A LinkedIn search returns more than 350,000 people with COBOL skills, 288,000 experts in ABAP (SAP programing language), 3 million C# programmers, and an astonishing 10 million people with Java skills.

Offshoring is a solution for skills shortage: All participating service providers have global operations and COBOL delivery capacity in India. The assumption that a COBOL career is not interesting to youth generations is valid in the U.S.; however, global companies have found ways to attract and retain talents to work on mainframes and COBOL.

Knowledge versus innovation dilemma: Knowledge retention can be a challenge for clients that migrate from COBOL to Java because newly hired programmers do not understand the business and the company may not have a career path to offer to experienced COBOL programmers. A few solutions that compile COBOL to Java enable the co-existence of both programmers for a smooth transition, enabling for knowledge transfer.

Java is by far the preferred destination language when moving off the mainframe. Other languages include .NET, C#, Python, and Powershell (the last two for scripting batch jobs.). Code re-engineering and code conversion tools provide automation to replace COBOL with Java. It performs well on any cloud and any relational database. Application development tools can handle both languages, providing a smooth transition for application development shops.

Estimating project cost: Vendor and providers usually mention lines of code (LOC) as the base for cost estimation (76 percent of the respondents). However, complexity, tools, and size have an additional impact on pricing. Some statistics include:

- Modernization and code refactoring cost: US$0.25 to US$2.30 per LOC; project duration: 2 to 36 months; and project cost: US$100,000 to US$25 million.
- Transformation and code conversion cost: US$0.50 to US$8.00 per LOC; project duration: 6 to 60 months; and project cost: US$100,000 to US$50 million.

Estimating project viability: Mainframe MIPS measures hardware capacity; it is not used for project estimations. However, it provides the first cost estimate for the cloud. A rough estimation is one x86 core in the cloud can replace 50 to 100 MIPS mainframe.

- Top 100 mainframe clients manage more than 50,000 MIPS, with few of them operating more than 200,000 MIPS.
- Very large MIPS client manages 10,000 to 50,000 MIPS.
- Large clients manage 5,000 to 10,000 MIPS.
- Mid-sized clients manage 2,000 to 5,000 MIPS.

- Small clients manage less than 2,000 MIPS.
- Top mainframe outsourcing providers manage more than 300,000 MIPS each, up to millions of MIPS.
- The average outsourced mainframe has 4500 MIPS per client.
- The U.S. concentrates 60 percent of global mainframe MIPS.

Clients running less than 5,000 MIPS should consider migrating their mainframes to the cloud. Any of the migration options are viable and cost-effective, providing short-term ROI. Clients hosting 10,000 MIPS and more can consider MFaaS as the first move for cost saving while assessing the modernization and transformation options. Top 100 mainframe clients run mainframe farms, not single monoliths. Outsourcing is a good option to reduce cost, while offshoring eliminates the skill shortage risk. Simultaneously, top mainframe clients can consider clustering their mainframe systems around similar business functions to study each cluster separately.

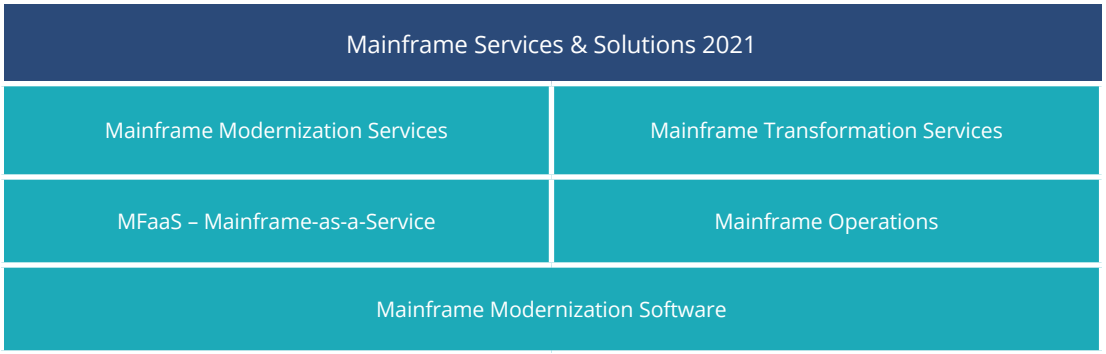
Financing mainframe modernization is a challenge: Many companies consider mainframe modernization a low return investment. A CIO of a large bank with more than 100,000 MIPS responded to our questions saying, "My mainframe is running the bank's support functions, it is certainly not a problem, and I am not going to invest in it, not even to turn it off." Vendors of modernization tools responded that, in most cases, the CIO sees the value but considers that the risk is an impediment. Vendors and service providers are working on making the projects faster, secure, and cost-effective to enable mainframe modernizations.

Consider self-financing the modernization: Some providers of application management and support services (AMS) propose deals that include mainframe modernization in the AMS goals. As a result, clients take the maintenance budget they already have and use it to move applications to low-cost platforms and code that is easier to maintain. Their three-year deal becomes a transformation program.

ISG Provider Lens™

Introduction

Simplified Illustration



Source: ISG 2021

Definition

Mainframes have evolved and scaled to handle high transaction per second (TPS) requirements. These machines consolidate many high-performing CPUs (cores) into a single hardware platform. Their architecture distributes tasks to cores that run in parallel, sharing the internal bus, memory and I/O, thereby providing superior performance. Because of its more than 40 years history, many mainframes today host legacy programming language applications written with COBOL, RPG, Fortran, PL/1, Natural and others.

To comply with digital transformation business requirements, clients can modernize their mainframe applications and introduce agile methods as well as automate continuous integration tools. Two alternatives exist in the market, which include modernization and transformation. Modernization updates legacy code without changing the programming language and introduces automation,

Definition (cont.)

DevOps and modern Agile practices. Mainframe transformation converts legacy code into modern languages to run on modern platforms, including private and public clouds.

To align with PAYG approaches, service providers have been offering MFaaS, which includes all hardware, software licensing and operations under a pay-per-MIPS arrangement. MFaaS is provided in a shared environment. Clients that need PAYG but prefer not to share resources may opt for managed mainframe operations, which enable custom combinations of hardware and licensing ownership.

This study focuses on understanding client objectives and assessing provider capabilities to deliver mainframe services, including modernization, transformation and supporting toolset.

The ISG Provider Lens™ study offers IT decision-makers the following:

- Transparency on providers' relevant strengths and weaknesses
- A differentiated positioning of providers by segments
- A perspective on different markets

This study focuses on the U.S. mainframe market.

ISG studies serve as an important decision-making basis for positioning, key relationships and go-to-market considerations. ISG advisors and enterprise clients use information from these reports to evaluate their current vendor relationships and potential new engagements.

Definition (cont.)

Scope of the Report

This study considers four mainframe markets: modernization, transformation, as-a-service and operations. To enable clients to select the tools available for modernization and transformation, this study includes a mainframe modernization software quadrant. This ISG Provider Lens™ quadrant study introduces five quadrants on mainframe services and solutions.

Mainframe Modernization Services: This quadrant focuses on service providers that offer legacy application modernization, introducing code repositories such as GitHub or similar options, DevOps integration and testing automation over original programming languages, such as COBOL, adding optimization to enable agility. After the modernization is complete, clients can embrace agile methodologies in the development and maintenance of applications running on mainframe systems.

Mainframe Transformation Services: This quadrant assesses application development and maintenance service providers that have evolved their application modernization methodologies to refactor, replatform or rewrite legacy programming language applications written with COBOL, RPG, Fortran, PL/1, Natural and others, enabling the same logic and business rules to run on any platform, including the public cloud.

MFaaS – Mainframe-as-a-Service: This quadrant assesses infrastructure service providers that offer shared IBM Z mainframes under a pay-per-use contract model. Services include facilities, hardware, connectivity, mainframe network management, licensing, operating system and subsystems, tools, and other services.

Mainframe Operations: This quadrant assesses traditional outsourcing providers that have long been offering mainframe services. Typical participants employ experienced practitioners to cover legacy mainframe technologies as well as the most recent mainframe releases. Services can be delivered on any hosting facility (client- or provider-owned).

Provider Classifications

The provider position reflects the suitability of IT providers for a defined market segment (quadrant). Without further additions, the position always applies to all company sizes classes and industries. In case the IT service requirements from enterprise customers differ and the spectrum of IT providers operating in the local market is sufficiently wide, a further differentiation of the IT providers by performance is made according to the target group for products and services. In doing so, ISG either considers the industry requirements or the number of employees, as well as the corporate structures of customers and positions IT providers according to their focus area. As a result, ISG differentiates them, if necessary, into two client target groups that are defined as follows:

- **Mid Market**: Companies with 100 to 4,999 employees or revenues between US$20 million and US$999 million with central headquarters in the respective country, usually privately owned.
- **Large Accounts**: Multinational companies with more than 5,000 employees or revenue above US$1 billion, with activities worldwide and globally distributed decision-making structures.

Provider Classifications

The ISG Provider Lens™ quadrants are created using an evaluation matrix containing four segments (Leader, Product & Market Challenger and Contender), and the providers are positioned accordingly.

Leader

The Leaders among the vendors/providers have a highly attractive product and service offering and a very strong market and competitive position; they fulfill all requirements for successful market cultivation. They can be regarded as opinion leaders, providing strategic impulses to the market. They also ensure innovative strength and stability.

Product Challenger

The Product Challengers offer a product and service portfolio that provides an above-average coverage of corporate requirements, but are not able to provide the same resources and strengths as the Leaders regarding the individual market cultivation categories. Often, this is due to the respective vendor's size or weak footprint within the respective target segment.

Market Challenger

Market Challengers are also very competitive, but there is still significant portfolio potential and they clearly fall behind the Leaders. Often, the Market Challengers are established vendors that are somewhat slow to address new trends due to their size and company structure, and therefore have some potential to optimize their portfolio and increase their attractiveness.

Contender

Contenders still lack mature products and services or sufficient depth and breadth in their offering, but also show some strengths and improvement potential in their market cultivation efforts. These vendors are often generalists or niche players.

Provider Classifications (cont.)

Each ISG Provider Lens™ quadrant may include a service provider(s) which ISG believes has strong potential to move into the Leader quadrant. This type of provider can be classified as a Rising Star. Number of providers in each quadrant: ISG rates and positions the most relevant providers according to the scope of the report for each quadrant and limits the maximum of providers per quadrant to 25 (exceptions are possible).

Rising Star

Companies that receive the Rising Star award have a promising portfolio or the market experience to become a leader, including the required roadmap and adequate focus on key market trends and customer requirements. Rising Stars also have excellent management and understanding of the local market. This award is only given to vendors or service providers that have made significant progress toward their goals in the last 12 months and are expected to reach the Leader quadrant within the next 12 to 24 months due to their above-average impact and strength for innovation.

Not In

The service provider or vendor was not included in this quadrant. There might be one or several reasons why this designation is applied: ISG could not obtain enough information to position the company; the company does not provide the relevant service or solution as defined for each quadrant of a study; or the company did not qualify due to market share, revenue, delivery capacity, number of customers or other metrics of scale to be directly compared with other providers in the quadrant. Omission from the quadrant does not imply that the service provider or vendor does not offer this service or solution, or confer any other meaning.

Mainframe Services & Solutions - Quadrant Provider Listing 1 of 4

	Mainframe Modernization Services	Mainframe Transformation Services	MFaaS – Mainframe-as-a-Service	Mainframe Operations	Mainframe Modernization Software
Accenture	Not in	Leader	Not in	Not in	Not in
Advanced	Not in	Product Challenger	Not in	Not in	Leader
Astadia	Not in	Product Challenger	Not in	Not in	Not in
Asysco	Not in	Product Challenger	Not in	Not in	Product Challenger
Atos	Leader	Leader	Leader	Leader	Not in
Blu Age	Not in	Product Challenger	Not in	Not in	Leader
BMC	Contender	Not in	Not in	Not in	Not in
Capgemini	Leader	Leader	Not in	Leader	Not in
Cognizant	Contender	Product Challenger	Leader	Product Challenger	Not in
CPT Global	Contender	Not in	Not in	Not in	Not in
Deloitte	Not in	Product Challenger	Not in	Not in	Not in
DXC	Leader	Product Challenger	Product Challenger	Product Challenger	Not in

Mainframe Services & Solutions - Quadrant Provider Listing 2 of 4

	Mainframe Modernization Services	Mainframe Transformation Services	MFaaS – Mainframe-as-a-Service	Mainframe Operations	Mainframe Modernization Software
Ensono	Leader	Contender	Leader	Leader	Not in
Fujitsu	Not in	Leader	Not in	Not in	Not in
GFT	Not in	Product Challenger	Not in	Not in	Not in
GigaSpaces	Contender	Not in	Not in	Not in	Not in
Google	Not in	Not in	Not in	Not in	Leader
GT Software	Not in	Not in	Not in	Not in	Contender
HCL	Product Challenger	Leader	Rising Star	Leader	Not in
Heirloom	Not in	Not in	Not in	Not in	Rising Star
HostBridge	Not in	Not in	Not in	Not in	Contender
IBM	Leader	Market Challenger	Leader	Leader	Market Challenger
Infosys	Leader	Leader	Not in	Leader	Not in
INNOVA	Not in	Contender	Not in	Not in	Not in

Mainframe Services & Solutions - Quadrant Provider Listing 3 of 4

	Mainframe Modernization Services	Mainframe Transformation Services	MFaaS – Mainframe-as-a-Service	Mainframe Operations	Mainframe Modernization Software
Keyhole	Not in	Contender	Not in	Not in	Not in
LzLabs	Not in	Not in	Not in	Not in	Product Challenger
Maintec	Not in	Not in	Not in	Contender	Not in
Micro Focus	Not in	Not in	Not in	Not in	Market Challenger
Mindtree	Product Challenger	Leader	Not in	Product Challenger	Not in
MOST	Not in	Contender	Not in	Not in	Not in
Mphasis	Product Challenger	Leader	Not in	Contender	Not in
NTT (UniKix)	Not in	Not in	Not in	Not in	Contender
NTT DATA	Not in	Contender	Not in	Not in	Not in
PSR	Not in	Not in	Contender	Contender	Not in
Raincode	Not in	Not in	Not in	Not in	Contender
Software AG	Contender	Not in	Not in	Not in	Not in

Mainframe Services & Solutions - Quadrant Provider Listing 4 of 4

	Mainframe Modernization Services	Mainframe Transformation Services	MFaaS – Mainframe-as-a-Service	Mainframe Operations	Mainframe Modernization Software
SysperTec (Virtel)	Not in	Not in	Not in	Not in	Market Challenger
TCS	Not in	Leader	Not in	Leader	Not in
Tech Mahindra	Contender	Leader	Not in	Not in	Not in
TmaxSoft	Not in	Not in	Not in	Not in	Leader
TSRI	Not in	Not in	Not in	Not in	Leader
T-Systems	Product Challenger	Product Challenger	Contender	Contender	Not in
Unisys	Product Challenger	Not in	Not in	Rising Star	Not in
UST	Leader	Rising Star	Not in	Not in	Not in
Vion	Not in	Not in	Contender	Not in	Not in
Wipro	Not in	Market Challenger	Not in	Contender	Not in

Mainframe Services & Solutions Quadrants

ENTERPRISE CONTEXT

Mainframe Transformation Services

The report is for U.S.-based enterprises, evaluating providers of mainframe transformation services for moving and modernizing mainframe to a modern developed environment.

In this quadrant report, ISG assesses the current market positioning of providers of mainframe transformation services. These providers can assess and rewrite legacy programming language applications written with COBOL, RPG, Fortran, and others that typically run-on mainframes.

The accelerating transformation of enterprises, further triggered by the COVID-19 pandemic has compelled enterprises to focus on transformation from legacy languages and technologies to the more advanced options as many systems could not withstand the load faced by during the pandemic. Given the widescale shortage of skilled professionals, enterprises are increasingly turning to service providers that can assess and rewrite legacy programming language applications based on different business needs.

Who should read the report:

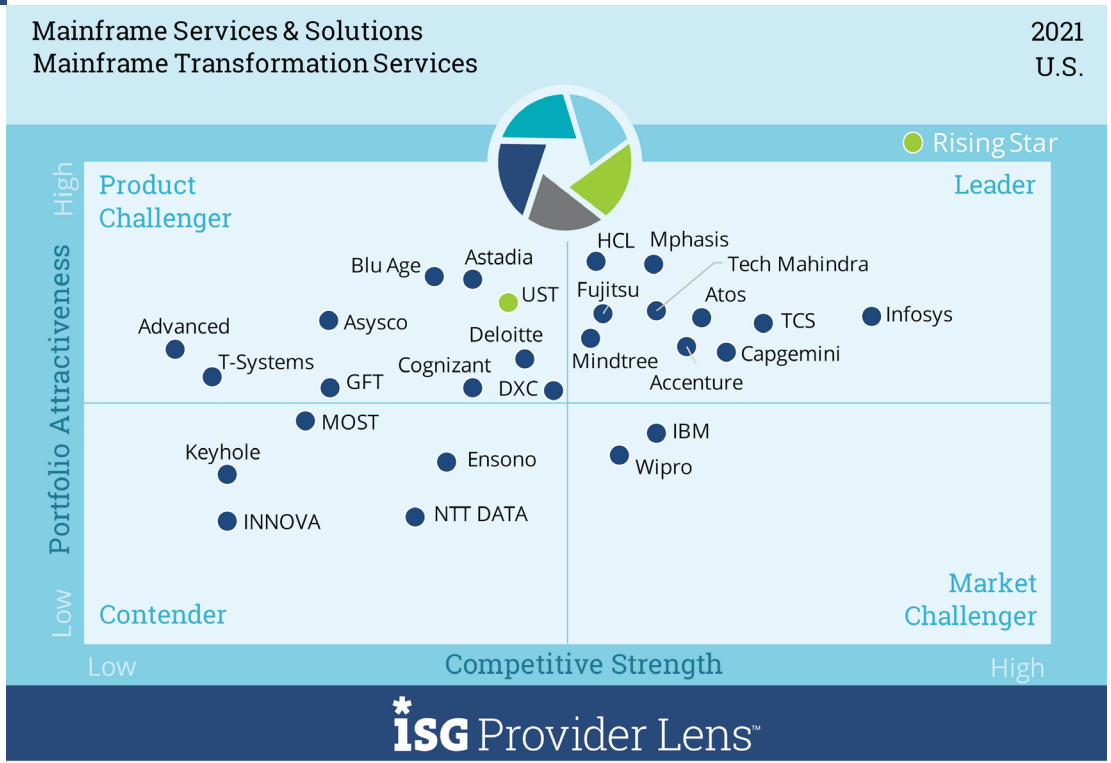
- **Marketing and sales leaders** should read this report to understand how providers can help them develop and leverage a broad range of applications from multiple environments to enable improved business planning and go-to-market strategy.
- **Operational leaders and finance leaders** should read this report to understand ways to differentiate, engage with and manage relationships with mainframe service providers to achieve optimal return on investment, including business performance improvements.
- **IT and technology leaders** should read this report to understand the strengths and weaknesses of providers, offering mainframe transformation services, including their offerings, capabilities, market presence and strengths, relationships with other mainframe service providers, and the way they employ the latest technologies and capabilities to deliver reliable offerings, in keeping with enterprise business and market change.

MAINFRAME TRANSFORMATION SERVICES

Definition

This quadrant assesses application development and maintenance service providers that have evolved their application modernization methodologies to assess and re-platform, refactor, or rewrite legacy programming language applications written with COBOL, RPG, Fortran, PL/1, Natural and others, which typically run on mainframes. The main target programming languages may include Java, .NET, C# and others, enabling the same logic and business rules to run on any platform, including the public cloud.

Clients that want to move their applications off the mainframe into other infrastructure technologies can choose a service provider to convert legacy code to programing languages suited to run on open platforms. Destination servers can include HPC clusters or cloud Infrastructure-as-a-Service (IaaS). Data stored in mainframe-type databases such as DB2 are converted to other SQL databases (many options). A complete transformation should include UI translation services, eliminating green screens while introducing modern graphic UI for better UX.



Source: ISG Research 2021

MAINFRAME TRANSFORMATION SERVICES

Eligibility Criteria

- The service provider must be able to reverse engineer legacy applications to provide application logic documentation.
- The service provider must be able to automate code conversion tools to reduce the time required to transform the applications.
- Optionally, the service provider can offer emulation systems to run legacy applications on other platforms without rewriting code. However, the provider should offer convincing case studies that demonstrate the viability of the emulation to be considered.
- The participant should have data center infrastructure (mainframes, servers, middleware, storage, databases and tools) to support the transformation program. Optionally, the provider can show it has partner resources that enable the hosting of the transformation program.
- Services must include application assessment, phased transformation with robust testing and quality assurance, application decoupling, system architecture, API development and future state application governance.
- The transformation should enable the client organization to operate Agile development and maintenance with CI/CD automation.

MAINFRAME TRANSFORMATION SERVICES

Observations

With automation and cloud computing capacity, mainframe transformation has become a secure path for any client. It is a growing market, with increasing interest. Many factors drive this trend, which are as follows:

- Business units pushing IT for more agility;
- The need to unify applications in the cloud and close the data center;
- The marketing push from AWS, Microsoft and Google, as all three have launched mainframe migration programs, with incentives in certain cases;
- The newer technologies that lower project cost and duration with increased reliability;
- IBM pushing z15 upgrades triggers clients to seek help;
- End of support for legacy mainframes such as AS/400 and Unisys Dorado OS.

The service providers in this quadrant use several tools from different vendors, and they select the best tool for each client needs. The Leaders have developed proprietary tools to integrate and orchestrate the partner tools they use. For each client, the transformation project may deal with different languages, particular programing styles and standards that the automation tools cannot understand, requiring expert intervention. Projects can mix replatform and re-engineer, which adds complexity.

Transformation projects range from 12 to 60 months, requiring robust project management skills. Planning and testing cycles consume most of the project time. Code conversion or compiling, emulator installations, and database conversion use automation and run relatively fast.

We qualified 10 Leaders and one Rising Star in this quadrant. They are as follows:

- **Accenture** is a global professional services company with capabilities in digital, cloud and security. The company has partnered with AWS, Microsoft and Google to develop special programs that focus on migrating mainframes to the cloud. It can deliver cloud lift-and-shift and application re-engineering to convert legacy code to new application architectures. Accenture uses leading tools to provide mainframe emulation and code rewriting. In 2019, it acquired Caltec Scube, a niche provider of mainframe migration and application code conversion tools to scale its technology to large enterprises. Accenture cloud mainframe migration partnerships include Microsoft Azure and Google.

MAINFRAME TRANSFORMATION SERVICES

Observations (cont.)

- **Atos** is a global service provider with more than 104,000 employees in 71 countries and generates €11 billion in revenue. Its portfolio includes cybersecurity, cloud and HPC. It offers transformation services that leverage a large application development organization and its MIII framework. Atos offers a self-funded transformation approach to enable enterprises to move out of their mainframes at a low-risk pace. Robust technology enables rehosting of mainframes for immediate savings, while automation tools power smart application transformation. Its self-funded program promises complete transformations to the cloud in three years.
- **Capgemini** is a global service provider with more than 270,000 employees in 50 countries and generates €15.8 billion in revenue. It has large operations in the U.S., supporting clients from 44 offices. The company offers many mainframe services and developed Code Analysis Platform (CAP360) to accelerate application assessments and application code transformation. Capgemini has a strong focus on migrating mainframes to the cloud in partnership with Amazon, Google and Microsoft. The company offers a robust solution, comprising its intellectual property, partner tools and experienced practitioners. Capgemini is a Microsoft Azure partner for mainframe migrations.
- **Infosys** is a global service provider with more than 249,000 employees in 46 countries and generates US$13.1 billion in revenue. Infosys A.R.T. Modernization is a framework that guides mainframe transformation. It uses automated tools to assess a client's portfolio, identifying the applications to keep on the mainframe, replatform to cloud, or re-engineer to modern application architectures. Infosys provides a comprehensive transformation program. Its cloud mainframe migration partnerships include AWS, Microsoft Azure and Google.
- **Fujitsu** is a global company with more than 130,000 employees and generates US$35.4 billion in revenue. It has a long history in mainframe technology and services. Mainframe migration to the cloud is enabled by Fujitsu's PROGRESSION™, an automated suite for application modernization. Clients can escape from long assessments and architecture decisions to adopt a proven framework to rapidly migrate out of the mainframe into Microsoft Azure with a cloud-native application written according to Microsoft's recommended code standards. Clients experience the benefits of object-oriented applications. Fujitsu is a Microsoft partner for mainframe migrations.

MAINFRAME TRANSFORMATION SERVICES

Observations (cont.)

- **HCL Technologies** is a global service provider with more than 153,000 employees (called "ideapreneurs") working in 50 countries. It generates US$10 billion in revenue. It is listed by Google as a mainframe modernization partner. HCL has developed a comprehensive toolset to cover all aspects of legacy applications transformation. Its toolset orchestrates several vendor tools, making it one of the most complete offerings of the assessed companies, which explains its high position in portfolio attractiveness.
- **Mindtree** is a global technology consulting and service company with more than 21,000 employees in 15 countries and generates US$1 billion in revenue. The company offers a full stack of mainframe services, from infrastructure operations to application development. Mindtree's Mainframe and Midrange Center of Excellence (MMS CoE) provides modernization principles and proprietary frameworks that merge with partner tools, using leading-edge technologies for rapid mainframe transformations and migration to the cloud.
- **Mphasis** is a global service provider with more than 22,000 employees in 16 countries and generates US$1 billion in revenue. The company offers an extensive service portfolio and has long experience in mainframe technologies. Mphasis has a compelling zero-cost transformation program. It proposes an application maintenance services (AMS) deal, with the promise of modernizing all systems in three years. Ideally, clients would pay for Mphasis AMS the same amount they would pay for any provider, with the advantage of converting legacy applications to modern technologies.
- **Tata Consultancy Services (TCS)** generates US$22 billion in revenue and has more than 469,000 consultants in 46 countries. Its transformation services are based on TCS' MasterCraft™, a tool that analyzes applications' code and automates code generation. TCS is a strategic partner for hyperscalers, and it has collaborated to develop mainframe migration programs with AWS, Microsoft and Google. TCS can handle ambitious transformation programs.
- **Tech Mahindra** (Tech M) is a global service company with more than 121,000 employees in 90 countries and generates US$5.2 billion in revenue. The company has a global legacy modernization center of excellence to support the modernization of mainframe assets, application interfaces and business processes. Tech M employs sophisticated tools to address clients' business needs, including SaaS options to replace applications. It designs modern architectures that exploit cloud services and hybrid cloud integration.

MAINFRAME TRANSFORMATION SERVICES

Observations (cont.)

- **UST** (Rising Star) is a global service provider headquartered in California, U.S., with more than 26,000 employees in 25 countries. UST has a renewed focus on mainframe migration to the cloud. The company leverages a robust partner ecosystem and its experience in customer experience design to deliver renewed functionality and elevated UX. UST employs the best tools in the market to deliver smart transformations. It is growing in the U.S. market at an accelerated pace, positioning the company to enter the Leader's quadrant.

HCL

Overview

HCL Technologies is a global service provider with more than 153,000 employees (called “ideapreneurs”) working in 50 countries. It generates US$10 billion in revenue. It hosts a mainframe lab in Sweden, a mainframe center of excellence in the U.S., and one in India. HCL has acquired many product tools from IBM and holds a privileged position in IBM’s partner program. HCL is listed by Google as a mainframe modernization partner.

Strengths

Comprehensive transformation framework: HCL transformation leverages FENIX 2.0, a change framework that promotes experimentation to drive innovation. The transformation is supported by robust automation, including Prizm® for portfolio assessment, iLIT DC for business rules extraction, ATMA for transpilation and conversion to auto generate modern cloud-native applications. It leverages leading-edge code generation tools such as Google G4. HCL's unique features include automated testing and quality assurance tools and methods.

Execution capacity: HCL has delivered many transformation programs, allowing the company to continuously improve its execution capacity. It currently has more than 12,000 professionals dedicated to mainframe transformation. It supplements capacity and expertise with partners, including IBM, Google, Micro Focus, BMC, Broadcom, Advanced (Modern Systems), TmaxSoft, Apigee, Mulesoft and others.

Benefits realization: HCL provides an end-to-end solution to enable clients to recognize solid benefits. Clients can start by moving their mainframe to HCL’s data centers to save on costs. Its modernization approach can reduce MIPS and expose APIs for better integration with cloud services. Its toolset can provide up to 100 percent code conversion, from COBOL to Java, C#, .NET and other languages. Results are tested and validated to ensure business continuity. Two years’ program can enable clients to see their mainframes transformed into modern, cloud-native applications in the cloud.

Caution

HCL could be listed by AWS and Microsoft in their mainframe modernization partner programs. HCL should evolve its competency certifications to augment its brand exposure on these hyperscalers.

2021 ISG Provider Lens™ Leader

HCL provides innovation with a robust transformation framework that ensures business continuity, security and superior application performance at lower cost.

Methodology

METHODOLOGY

The research study "ISG Provider Lens™ 2021 – Mainframe Services & Solutions" analyzes the relevant software vendors/service providers in the U.S. market, based on a multi-phased research and analysis process. It positions these providers based on the ISG Research methodology.

The study was divided into the following steps:

1. Definition of Mainframe Services & Solutions market
2. Use of questionnaire-based surveys of service providers/vendor across all trend topics
3. Interactive discussions with service providers/vendors on capabilities & use cases
4. Leverage ISG's internal databases & advisor knowledge & experience (wherever applicable)
5. Detailed analysis & evaluation of services & service documentation based on the facts & figures received from providers & other sources.
6. Use of the following key evaluation criteria;
   - Strategy & vision;
   - Innovation;
   - Brand awareness and presence in the market;
   - Sales and partner landscape;
   - Breadth and depth of portfolio of services offered;
   - Technology advancements.

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Distinguished analyst and author, Pedro brings extensive experience in research of the Americas and SEMEA (Southern Europe Middle East and Africa) markets. With more than 30 years of experience in sourcing, he has developed vendor assessments plus contract restructuring, services scope and IT benchmarking programs for diverse vertical markets in the Americas and Asia Pacific. Before joining ISG, Pedro was a partner of TGT Consult and managing vice president at Gartner Inc., responsible for the consulting business in APAC and Latin America.

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ISG (Information Services Group) (Nasdaq: III) is a leading global technology research and advisory firm. A trusted business partner to more than 700 clients, including more than 75 of world's top 100 enterprises, ISG is committed to helping corporations, public sector organizations, and service and technology providers achieve operational excellence and faster growth. The firm specializes in digital transformation services, including automation, cloud and data analytics; sourcing advisory; managed governance and risk services; network carrier services; strategy and operations design; change management; market intelligence and technology research and analysis. Founded in 2006, and based in Stamford, Conn., ISG employs more than 1,300 digital-ready professionals operating in more than 20 countries—a global team known for its innovative thinking, market influence, deep industry and technology expertise, and world-class research and analytical capabilities based on the industry's most comprehensive marketplace data. For more information, visit www.isg-one.com.