



beta systems

## The Future of the Mainframe – Innovation Driver or Relic?

For decades, mainframes have dominated critical IT applications, particularly in financial services, health-care and public institutions. But in an era characterized by cloud technologies and scalable architectures, executives are asking themselves: has the mainframe lost its relevance or does it remain indispensable? A comparison between Amazon and VISA shows the performance of the mainframe: while Amazon sold around 636 items per second via its AWS infrastructure on „Prime Day“ 2016, VISA was able to process 56,000 transactions per second with an IBM z8 system in the same year (*Source: IDC, 2023*). This illustrates the efficiency and compactness of mainframe systems compared to container-based cloud solutions.

This white paper analyzes the technical strengths of the mainframe, current developments and their impact on the market in Germany and beyond. It offers recommendations for action and a look at upcoming innovations.

# The Technical USPs of the Mainframe

## Unrivaled Speed and Reliability

Mainframes are in particular by their decimal arithmetic, which allows a offers unparalleled accuracy in the processing of financial transactions. Financial service providers such as banks and insurance companies benefit enormously from this functionality, as billions of transactions per day are processed with absolute precision. The IBM z/OS processor uses specialized decimal units that perform binary-coded decimal arithmetic, resulting in higher speed and reliability *(Source: IBM Research, 2024)*.

## 100% Availability

Another outstanding feature is the unsurpassed availability. Mainframes guarantee that all data is accessible at all times with full computing power. Administrators can even replace CPU boards during operation without risking data loss or interruptions *(Source: Gartner, 2024)*. This is invaluable for industries with high security and availability requirements, such as aviation or healthcare.

## Massive I/O Bandwidth and True Virtualization

Thanks to their massive I/O bandwidth and the possibility of true virtualization, mainframes continue to set the standard in data processing. A study by IDC (2023) showed that mainframes can achieve a data transfer rate up to 10 times higher than x86 systems.

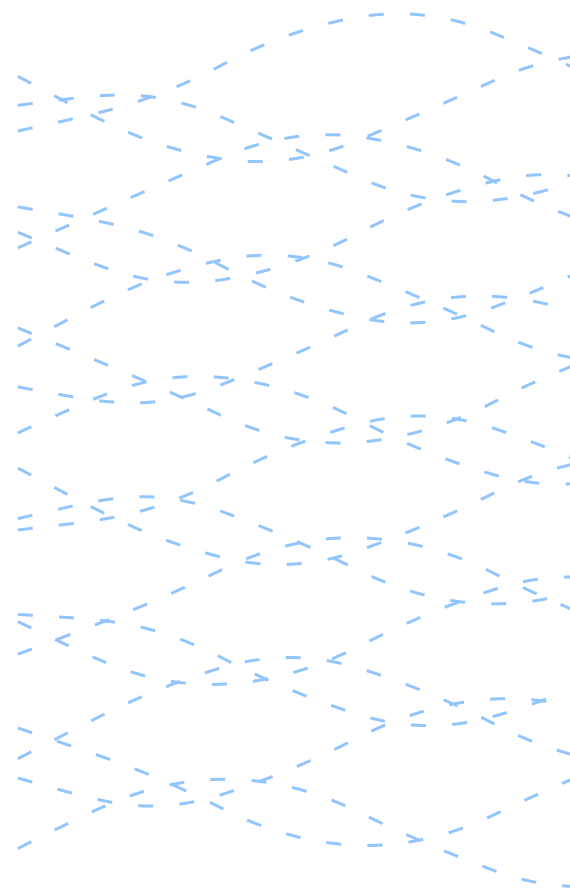
# Market Development and Practical Examples

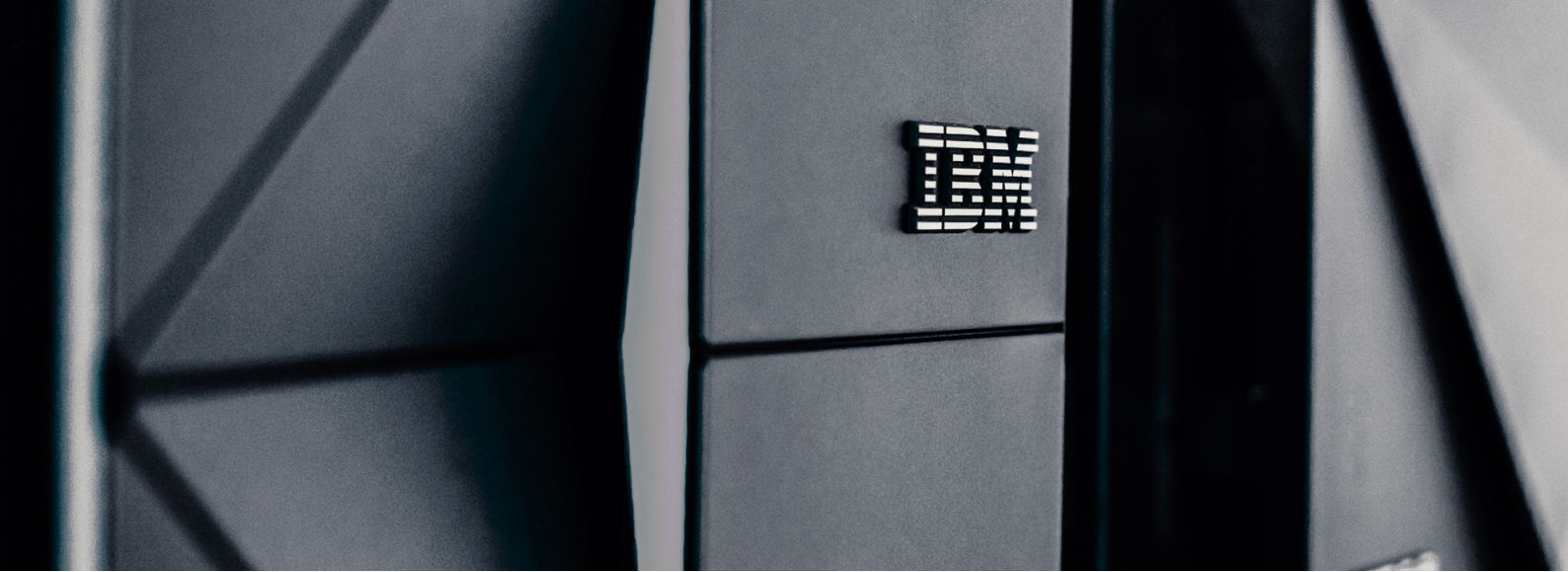
## Germany and the DACH Region

Demand for mainframes remains stable in Germany. Industries such as banking and insurance continue to take advantage of their exceptional reliability. A study by Capgemini (2023) shows that 72% of German companies use mainframes see them as a central component of their IT strategy.

## Global Market

Interest in hybrid mainframe cloud solutions is growing in the USA and Asia. The use of AI-based AIOps and integration with SaaS solutions are demand. For example, the major US bank JPMorgan Chase plans to fully integrate its z/OS systems into hybrid architectures by 2025 in order to optimize both scalability and efficiency. *(Source: Forrester, 2024)*





## Trends and Future Prospects

### Integration with Hybrid Cloud Environments

Hybrid models are gaining in importance. IBM has developed technologies such as Cloud Paks that enable the integration of mainframes into Kubernetes environments. This promotes the modernization of IT landscapes without sacrificing proven systems.

*(Source: IBM Whitepaper, 2024)*

### AI and AIOps for Optimized IT

The integration of AI-supported analyses (e.g. IBM Watson) automated troubleshooting and improves efficiency in mainframe operating environments.

*(Source: Planet Mainframe, 2024)*

### Promoting Young Talent for Mainframe Experts

The need for qualified specialists remains a challenge. Education programs such as the „IBM Z Academic Initiative“ have set themselves the goal of promoting young talent and thus the long-term availability of experts. *(Source: IBM Education, 2024)*

## Future-Proofing Through Integration and Innovation

### Integration with Modern Platforms

The constant further development of middleware technologies makes mainframes compatible with modern technologies such as Java, .NET and hybrid cloud architectures. Companies can therefore seamlessly integrate existing workloads into modern environments without having to forego the advantages of the mainframe *(Source: Forrester, 2024)*.

### Use of AI and AIOps

Recent developments such as the IBM Z IntelliMagic Vision offer AI-based performance optimizations that enable better predictability and faster problem solving. These solutions improve transparency in the IT infrastructure and reduce the need for manual intervention *(Source: Planet Mainframe, 2024)*.

Contrary to the myth that mainframes require entire production halls, modern systems have become more compact and energy-efficient. A current IBM z16 mainframe fits easily into a medium-sized server room and at the same time reduces energy consumption by **up to 30%** compared to traditional server landscapes *(Source: IBM Whitepaper, 2024)*.

# Recommendations for IT Decision-Makers

## ■ Think Hybrid

Companies should consider mainframes as part of hybrid architectures and use middleware to facilitate their integration into modern cloud systems.

## ■ Prioritizing Sustainability

Mainframes offer energy efficiency and cost benefits - an argument for sustainable IT strategies.

## ■ Use Innovations

Invest in AIOps solutions and AI to optimize automate operating processes and reduce costs.

## ■ Promote Specialists

Train employees to make optimum use of existing systems and close technological gaps.

## Conclusion

Far from being a relic, the mainframe is a driver of innovation. Thanks to continuous technological developments - from AI-supported automation to hybrid integrations - it remains a central pillar of corporate IT. For companies worldwide, a well thought-out combination of mainframe and modern technologies creates a future-proof IT landscape. CIOs and IT decision-makers should use this advantage to maximize efficiency, security and innovation.

**Conclusion:** Mainframes are not a contradiction to digitization - they are a Catalyst for this.

