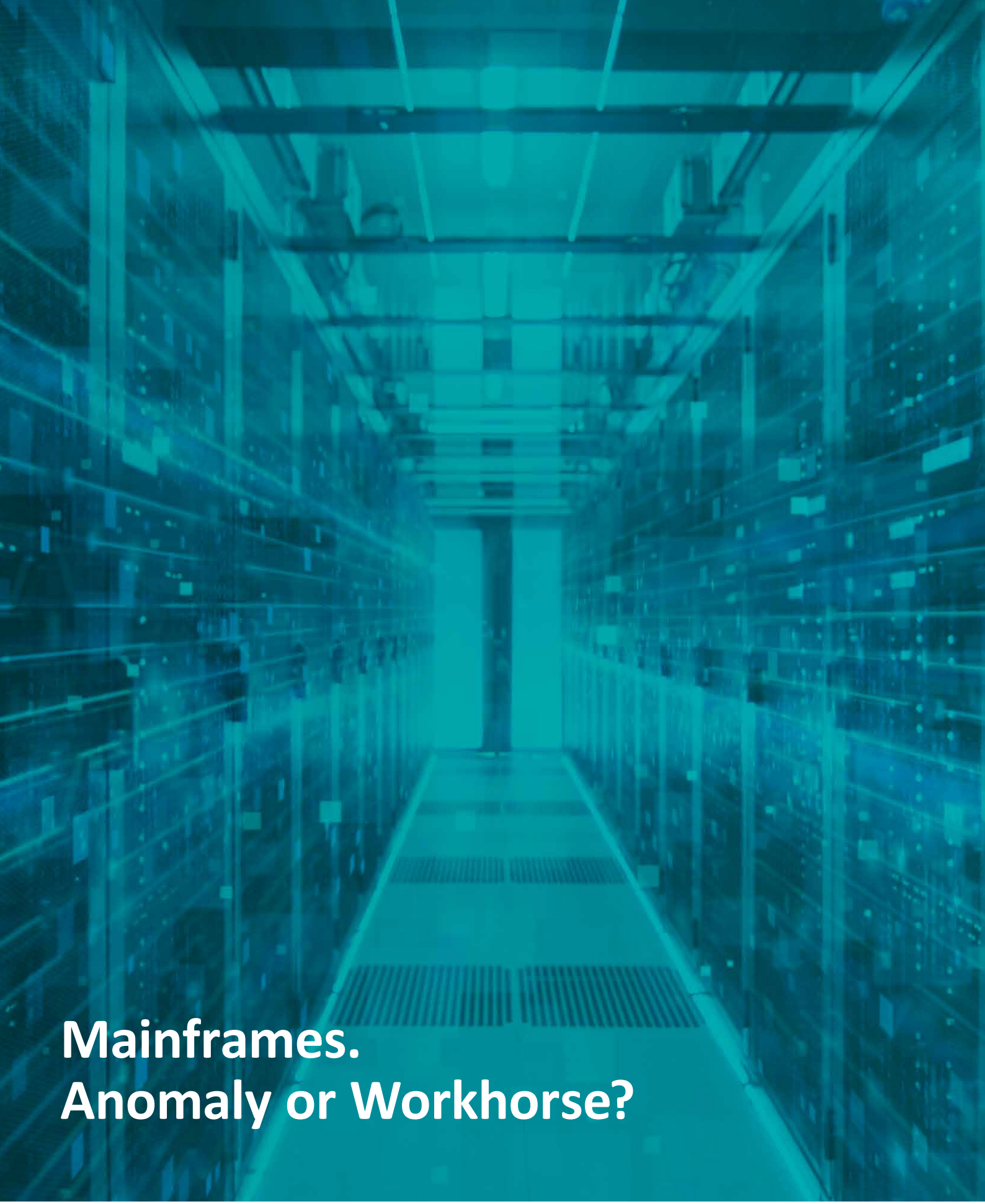

# Mainframes.
# Anomaly or Workhorse?

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# Executive Summary

## Businesses are updating their infrastructure, in the face of growing data-centric activities, the rise of artificial intelligence and machine learning, as well as greater regulation of how data is collected and used.

**This is so they can better appeal to an increasingly digital marketplace and user community. Amid this considerable change to infrastructure, there are many organisations continuing to depend on and invest in their mainframe estate.**

Is the mainframe an anomaly in the modern world of digital transformation or is it truly the workhorse that simply keeps on delivering? Whilst everybody is looking to the cloud and adopting cloud first strategies, this has taken a big bite out of the traditional onsite mainframe estate. However, digital transformation efforts have signalled less of a wholesale move to the cloud than many may have predicted. This is especially true in traditional mainframe heartland markets such as financial services and retail. Increasingly stringent regulations in these sectors have convinced organisations that the best place for sensitive customer data remains within a modernised mainframe environment.

However, it's not simply regulation that motivates the on-going use of the mainframe. Rather, it is a realisation that the mainframe delivers reliable, efficient and effective data processing. Furthermore, when well planned, a mainframe does not prevent but rather enhances digital transformation efforts.

The results of recent Ensono-CIF research* provided an interesting insight into this. Some 46% of respondents cited that making any changes to legacy systems would mean major business disruption. This lends credence to the adage that “if it isn’t broken, don’t fix it” and that if it continues to deliver effectively, retain it. A further third (34%) simply pointed to a resistance to change, something that spreads from the C-suite to the front-line. It is clear that the mainframe is regarded as a reliable workhorse and is embedded within modern businesses as the chosen platform for business critical systems of record.

The Ensono-CIF research included several hints as to why there has yet to be a wide-scale move away from the technology. One of the headline figures that stood out was the fact that over half (53%) of those businesses surveyed currently supports a mainframe estate. This number rose to almost two thirds (64%) among large organisations with more than 5,000 employees. These are not exactly the stats of a dying technology. Rather it is an illustration of how the growth of big data, automation, machine learning, and other data-centric transformational changes in today’s business verticals, have validated the role of the mainframe more than ever.

> “Some 46% of respondents cited that making any changes to legacy systems would mean major disruption.”

## Defined by High Availability

**Mainframe computers have been used successfully by large organisations for decades to host business critical applications and process ever-increasing amounts of data. They are viewed as a safe pair of hands. Obtaining their name by the fact they were often found in large cabinets – or "main frames" – the term was later used to distinguish high-end commercial ‘super computers’ from less powerful CPUs.**

Mainframes are defined by high availability and that has, in many ways, been the principle reason for their longevity, since they are typically used in applications where downtime would be costly or catastrophic. Across all verticals, where there is a need for near-continuous operation with minimal annual downtime, mainframes continue to hold the edge over other on-premise and cloud platforms.

## Working Harder Than Ever

**Despite the belief that mainframes would die out around the turn of the millennium, they have remained.** Their role has evolved and they are increasingly used to process and store the big data requirements that have enveloped society. As mobile operators were unprepared for the massive uptick in data usage caused by consumers’ enthusiasm for text messaging in the late 1990’s, numerous verticals, from retail to hospitality have been unprepared for the wealth of data being produced in their organisations.



*Connecting the business – unlocking digital transformation success (Ensono-CIF, January 2018)

From the seemingly unstoppable internet of things (IoT), as well as the industrial internet of things (IIoT), automation and machine learning is sweeping through the workplace.

As the amount of data increases, so does the processing power required to unlock the information held within. The data emitted from IoT devices is now so large that research suggests that the energy consumed to process it will increase to around 140 billion kilowatt-hours annually by 2020 in the US alone. That's the equivalent to nearly 100 million metric tons of carbon pollution . This kind of mass data manipulation lends itself perfectly to the mainframe vs other server platforms.

Moreover, the increase in transactions hitting the backend as a result of changing user habits and increased use of mobile applications has had a profound impact on the mainframe, highlighting the relevance and importance of the platform in volume transactional data scenarios. People check their bank balances far more often than they used to thanks to mobile devices. Each one of those look-ups is a transactional hit. The same applies for things like pre-loading retail baskets as well as mobile payments and casual messaging. This growth in the kind of data that mainframes were built for is at the core of why the mainframe is thriving in this new mobile-centric business world.

> "89% of respondents view legacy technology as an explicit barrier to digital transformation efforts."

## A Question of Balance

**Mainframes are often viewed as a barrier to digital transformation, as evidenced in the Ensono-CIF research.** The data revealed that 89% of respondents view legacy technology as an explicit barrier to digital transformation efforts. This though, is to misunderstand the nature of transformation. There are a number of barriers to modernising legacy mainframe environments, most notably the scale of the existing systems and their criticality to the operations of the business, as well as simple inertia within these environments.

Therefore, modernising the mainframe environment to enable it to become part of the transformation, rather than an obstacle, is the logical desired outcome. Begin by designing and building APIs that expose existing legacy business logic (services), through restful interfaces, as a simpler first step, building up devops capability for service delivery. From there, updating and evolving the COBOL components behind the APIs is the next step, albeit a more time and skills intensive one. At this point you can then interface modern platforms such as Linux and implement modern architectural approaches like microservices; and introduce new languages that leverage the mainframe, such as Java, node.js or swift, to exploit the rich functionality, higher productivity and access to skills enabled by their ecosystems. With this direction, organisations can retain many of the resiliency, performance/scale and security features associated with the mainframe while still benefiting from modern agile OS features.

IBM suggests that the best approach to mainframe modernisation is to identify small steps based on improving the performance of specific business processes and to modernise the mainframe in line with these. Furthermore, the most effective organisations identify specific business processes, then interface modernised mainframe processes into more transformational technologies using APIs to enable a more rapid realisation of the benefits of transformation.

Today, digital technologies and applications are continuously being reinvented to match shifting industry landscapes born out of changing consumer demands. However, this digital transformation varies between industries, with some far surpassing others in their transformation. There are also variances within every industry too, where we find digital beginner companies, the digitally mature, and everything in between. Mainframes tend to occupy a place at the core of larger established organisations but are the very heartbeat for many of these organisations and, therefore, must be encompassed within any digital transformation strategy. Ensono believes that the legacy technology in these organisations is what made them great, and to simply disregard them in any transformation journey is to ignore the very DNA of the organisation. IBM concurs on this point, noting that a rip and replace solution for mainframes is a very high risk approach and one that has often failed.

> "The mainframe space is already struggling with one of the biggest deficits in the IT skills gap."

As marketplaces go, the UK as a case example has undergone more digital transformation than many. For example, recent figures reveal that mobile now accounts for 41% of all retail revenues in the UK . As such, retail in the UK is one of the most rapidly changing sectors across the world and needs to be at the forefront of technological advancement to keep pace with the evolving needs of an always-on customer base. Retail also exists as one of the bigger traditional mainframe user verticals, employing their use both centrally as well as within larger locations such as larger stores and distribution points.

## Overcoming Barriers

**There are many barriers to modernising mainframe operations across industries.** As we highlighted earlier, almost half of the organisations surveyed within the Ensono-CIF study (46%) cited the fact that any changes would mean major business disruption that they couldn't afford. However, that number jumps to 52% in the entertainment and media sector, 60% in telecoms and 55% in the mainstream technology world. In the retail sector, 59% are concerned about replacement costs being too high, while 56% said the same in manufacturing. Some sectors are clearly more conscious of the level of disruption that would be required to modernise their mainframe environment, but this should not be a barrier to change, rather a factor that should be considered within the planning cycle.

IBM observes that many organisations know the changes they need to embrace but are nervous about taking the first steps. With many new and fresh ideas

coming into organisations regularly there needs to be a new approach to change, where risk is understood and accepted and small, incremental changes made more regularly. This is to keep the mainframe in step with the more rapidly developing world of cloud computing.

For some organisations, the main barrier is one of internal resources. One-in-three (30%) admit that they would only have a limited skills base internally who would know how to maintain an updated system. The mainframe space is already struggling with one of the biggest deficits in the IT skills gap, making any wholesale changes or migrations all the more complex to achieve. Interestingly – and somewhat counterintuitively – that number increases to almost two-in-five (37%) for businesses with more than 5,000 employees, and 42% of organisations in the financial services industry. This highlights the need to take action on developing the skills base now, while the knowledge is still in place in the industry to pass on to the next generation. Modern languages and development environments can be used to develop for legacy systems. It's important that we fuse the existing mainframe skills and knowledge with new technologies and approaches to achieve a best-of-breed future for the mainframe community. An insistence by older mainframe experts in the business to stick with older green screen approaches is no excuse for shunning modern developer technologies and skills.

## Optimising for Tomorrow

Mainframes have and continue to deliver significant compute performance across many sectors. They operate at the core of many organisations to reliably, consistently and securely process data and transactions. In the current world of digital transformations, these workhorses need to be included as an integral element of the digital transformation journey. They should be embraced as core components rather than viewed as a legacy that must somehow be overcome.

Examining core mainframe operations and improving these in small, incremental steps in parallel, taking advantage of new technologies and tooling, to building new digital eco-systems around them allows organisations to deliver change rapidly and effectively. This is whilst building upon the great core systems that have sustained them for many years. Mainframe skills may be in short supply, but recognising the value of these systems and building a strategy that places them firmly at the core will help drive a new generation of technologists in this direction and assist in alleviating a shortage of skilled practitioners in the long-term.

"These workhorses need to be included as an integral element of the digital transformation journey."

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