



REPORT

FIVE STEPS TO THE
MICROSECOND MINDSET



INTRODUCTION

How to approach real-time data analytics to harness the value of continuous intelligence

New research* shows that 90% of businesses are planning to increase their investment in technologies that will help them derive greater value from the data they own, with real-time or streaming analytics platforms being a key area of focus. These firms understand that having the ability to capture real-time data, contextualise it with historic data and make 'in the moment' decisions gives them a vital competitive edge.

This is the era of continuous intelligence, and it will be a game changer for companies across a range of industries.

Yet despite high levels of investment and awareness, many businesses could be limiting their success by not thinking fast enough. The same research shows that more than 70% of businesses believe 'real-time' data starts at a minute or longer with a quarter believing a real-time decision-making window can be as long as an hour.

* Independent cross sector research study polling 596 UK and US IT and Data Leaders in B2B organisations. January 2021

While shifting gears can be difficult, this playbook contains key steps that will help any organization – no matter the industry sector – to operationalize real-time data for faster, more informed decision-making.

Our five-step guide will help you understand how to build a culture and operating model for continuous intelligence in your organisation. We will take you through the processes, skills and tools you should consider when looking at moving to a Microsecond Mindset and how to build a compelling business case for adopting these transformative technologies.



'Enterprises rise and fall on the collected efficacy of the decisions they make every day. Sometimes those decisions are made by leaders. But many of them are also made by line employees. Or by decision logic that's embedded in applications. These are the high-speed decisions. And they have to be the best possible decisions, made using the most current data.'

Mike Gaultieri

Vice President and Principal Analyst, Forrester

STEP ONE

Assess and understand



Who wouldn't want the ability to make faster, smarter decisions? Yet we have to be realistic as not all firms need to be operating at the microsecond level. From our vast experience there are a few primary markers that indicate if a firm can benefit from accelerating its decision making.

Data is already at the heart of the business

- Though borne primarily out of the financial sector, microsecond-level decision making can benefit firms in sectors as diverse as manufacturing and automotive to utilities and telecommunications. A common trait is their appreciation of the value of data as it is created and that this diminishes over time.
- Firstly, these businesses are already processing large volumes of data faster than a human could ever hope to. Secondly, the value from that data is driving mission-critical business operations.
- Thirdly, they have a data-led culture, constantly mining the data they own for value, analysing and modelling the data for new insights which can be used to strengthen and improve businesses processes.

Have a clear idea of what success looks like

Another key marker that suggests a readiness for moving to a Microsecond Mindset (and the transformative data technologies that it will lead you to consider) is already having a degree of clarity on the benefits that will be experienced both in the short term and as the business evolves. These include:

- Measurable competitive advantage – a clear idea of what an early investment in better real time data analysis and decision making will mean in terms of differentiation from the market.
- Richer more contextual data – how the business will benefit from having the ability to bring data together, both data at speed and at rest, for deeper more meaningful insights.
- Faster and more innovative product/service delivery – excited by the potential that is bound within the data. How it will improve products and services, optimise workflows, reduce costs and manage risks.



➤ **Data, in all its facets and formats, is the new force fuelling innovation and guiding successful organizations in informing their decisions, reforming their processes, and outperforming their competition. It's all about data: digital transformation is premised on it, machine learning is built upon it, operational efficiency is measured by it. Data is, without doubt, the new power and real-time analytics can help you harness it.**

STEP TWO

Get your data in shape



The exponential growth in the velocity, volume and type of data that organisations are being exposed to means that there are huge variances in how well businesses manage their data.

The chances are that you're already thinking about how to get your data in shape for implementing real-time analytics. That may well mean assessing your own data cleanliness and organisation, or interrogating the solutions you're relying on to bring disparate data sources together and create that single organisational view that's so integral to next-generation data use.

You can work with customer-focused providers will cleanse your historic data for you, so it's ready for use, as well as continually cleansing, processing and manipulating new data as it arrives. In the meantime, these are the essential steps you'll need to take to get a handle on your data.

Audit your data landscape

While a core benefit of streaming analytics is speed – ingesting data in real time, running analytics in flight, and making it possible to act on it – in reality the key benefit is timeliness. Having data available – whether historic, real time or both – in the time frame needed for a critical decision to be made is key.

When you're working with with petabytes or perhaps zettabytes of data, getting a handle on where that resides, what format it is in, the applications that are using it etc. are key challenges. You need to have a clear picture of the current data environment before you can significantly improve operations.



Understanding your data

The most effective real-time analytics platforms will bring together data created in the moment with historic data. And the primary benefit comes when they can be seen in the context of each other, for example when using machine learning to run complex processing that facilitates automated actions. The richer the data, the better those automation solutions will perform – and continue to improve over time.

Below are the common types of datasets that businesses often seek to bring together:

- Datasets generated internally.
- Datasets sourced externally.
- Streaming data.
- Data at rest.
- Structured data.
- Unstructured data.

Each is a discrete, distinct set. And the relationship between can be complex.

However, while categorization is a key consideration, having the capability that can deal with multiple data formats is equally important. For example, if your existing real time system has no historical capability or if your historical system is just a key store without relational database functions then you will need to look at adding to your data software stack. However, it's also preferable to minimize the number of technologies needed to deal with the different type of data that exists within your organisation and you receive from external sources so you should look for solutions that can cover both the real time analytics and the management.

➤ In short, the better your understanding of where your data resides, its format, and its history, the better placed you'll be to shrink the decision-making window.



Uncover the value

Businesses often think about the amount of data they have. But often the more important consideration is the granularity of that data.

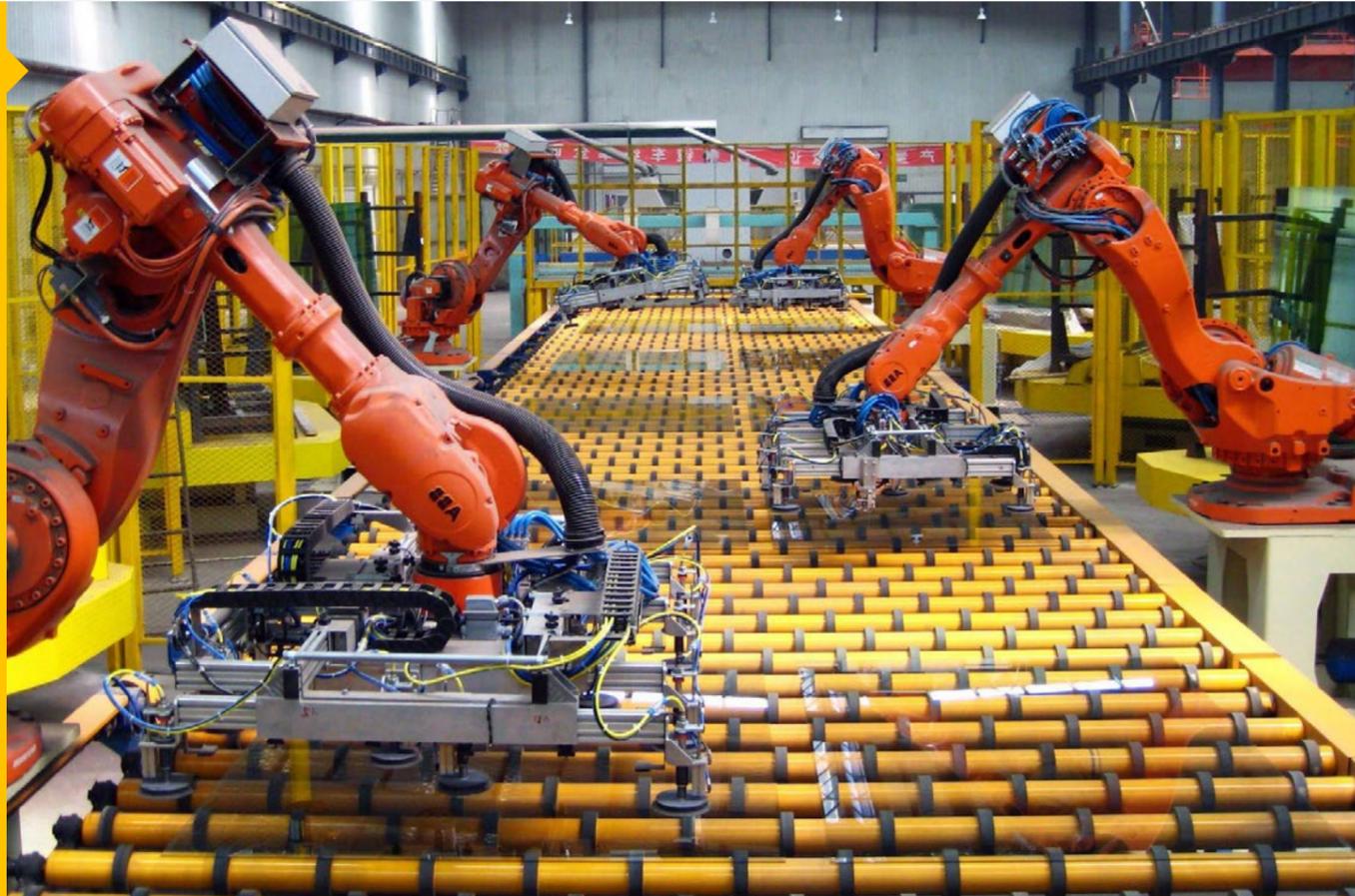
It's generally the case that businesses that run analytics over thousands or even millions of complex records per second gain the most from streaming analytics. That may not be you today, but if it sounds like you're on that path then it makes sense to begin investigating a solution.

It's also smart to recognise that some data and data sources are more valuable than others. Time series data, for example, is one of the most valuable sources around, particularly when generated in the IoT market. Highly-structured, machine-generated, and sent with timestamps between many thousands of devices at very high frequencies, it's relatively new to most organisations but prized. And you need a complete strategic solution for utilising it well.

➤ To help ensure applications and users are productive quickly, a streaming analytics platform should provide the full lifecycle of data services, including query processing, tiering, migration, archiving, data protection, and scaling along with analytics and visualization tools that enable users to define and perform queries, calculations, aggregations, machine learning and AI on any streaming and historical data.

STEP THREE

Think faster



Building a business case for fostering a Microsecond Mindset, and for the modern and ambitious technology it leads most businesses to implement, relies on linking the perceived need with the potential benefits.

And there are plenty of benefits, from the lifecycle of your analysis, to your hardware footprint, to how agile you can be.

For some, adopting streaming analytics will let their business make confident decisions more easily. Others will see it reduce the burden of analytics (particularly if there's undue load on systems to push and pull data), or help stretched internal IT teams with data management.

Save time, improve results

The best streaming analytics solutions can back test and recalibrate across various parameters. In doing so, they make investigations and analysis much easier and faster for busy teams.

In finance, for example, significant percentage changes in stock price will create alerts that need to be looked at. But since there are many known techniques for manipulating the markets, and hundreds of millions of data points transacted every single day, big banks' typically small compliance teams become incredibly stretched. It's also important to understand that banks need to cater for new and unknown threats which requires advanced research and modelling to identify future issues.

Streaming analytics can add real-time context to historical data, so teams can focus their time on what needs investigation, rather than looking at every alert that appears.



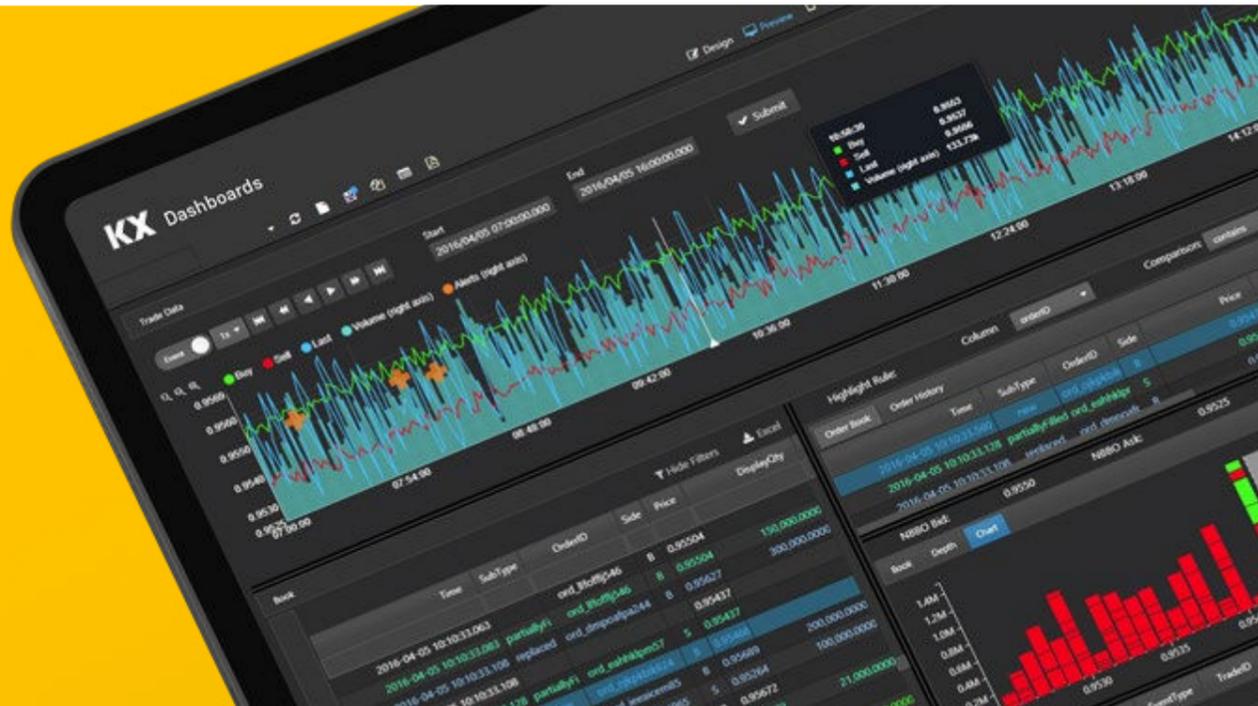
Learn and grow

Streaming analytics works with machine learning technologies that grow in sophistication, getting smarter with each iteration. So, any investment today will pay long term dividends as well as creating immediate impact.

In practice, the process begins with a robust and stable core system. Once that's installed and working it can scale and grow as data volumes do. Analysts and scientists can then build models and innovate quickly, working within a framework that empowers them to use data in evolved, smarter ways. It's the bedrock for iteratively building capabilities, adding new data pipelines and using the technology to add value over time.

Easier to understand analytics

The results of data analysis work can be hard to interpret. Usually this adds time into processes as analysts work harder to find the useful insight in the masses of results. Leading streaming analytics solutions present information in easy-to-use dashboards that provide fast, clear, concise detail – just like this one.



They also make it easier for scientists to yield and present results quickly. For example, a data science team working in an industry like pharma will now have near infinite amounts of data available to them (a mix of historic and real time) for instantaneous mining. Streaming analytics can transform their world of batch workflows and elongated feedback loops to interactive decision-making cycles, delivering analysis in microsecond when previously the timeframe was in hours.



➤ At KX, we know that shortening the time it takes to ingest, store, process, and analyze historic and real-time data is a game changer. Our customers in finance, manufacturing, automotive, telecommunications and utilities tell us that when processes and systems are continuously fed by real-time data that is enriched by the context of historic data, they can automate critical business decisions resulting in significant operational and commercial benefits.

STEP FOUR

Anticipate likely challenges



Adopting a Microsecond Mindset is not always straightforward. And challenges and pushback could come from anywhere, with likely issues around extreme data complexity, introducing a new system to already full data software stacks, and creating a new 'skills need' within the business – when new IT skills are not always easy to come by.

Working in partnership with a potential provider, as well as addressing any possible hurdles in your business case, will help you instill the mindset across the organisation.

Three things to consider...

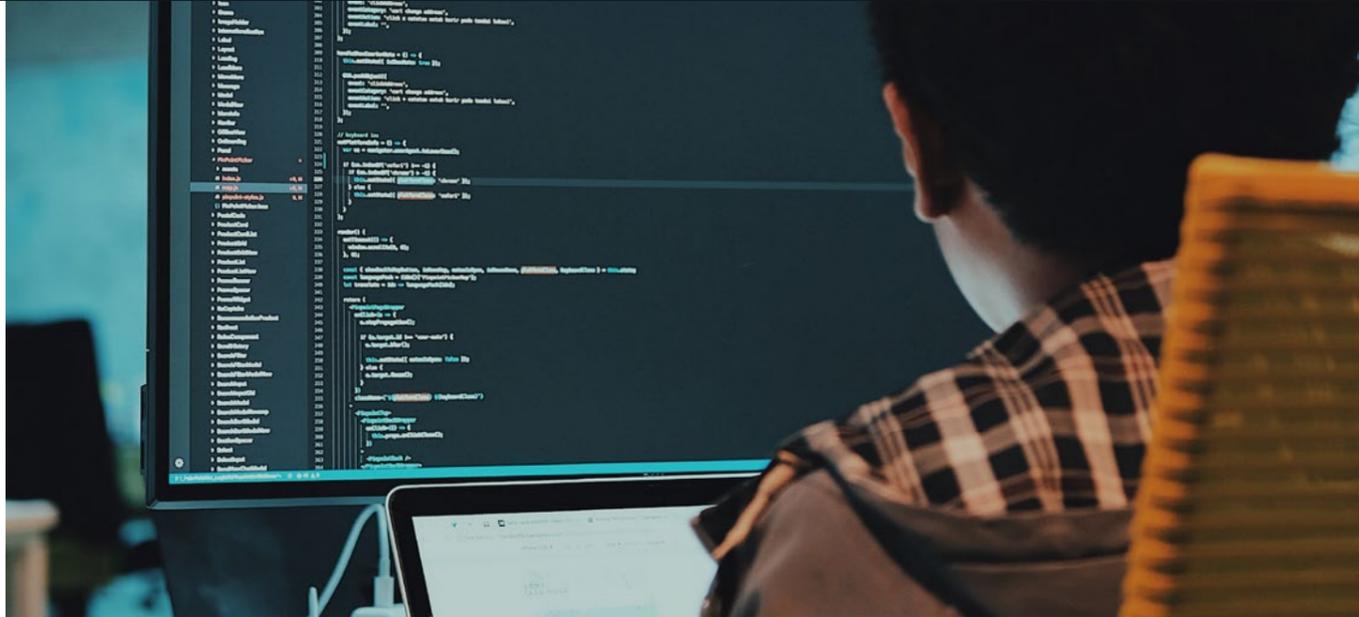
Technology interoperability

The way that streaming analytics solutions work with existing and new datasets means they must interact with many existing technologies. For example, Formula One engineers build numerical models in the factory and then embed these models in real-time data pipelines to generate insights on race day to optimise race strategy and split-second decision-making on the track.

Working with a provider that prioritises easy interoperability and supported installation is essential. Your business insights and custom analytics should integrate seamlessly with your data stack, working as a vital lens across your business activity and providing an extra level of granularity and decision making.

With the size of data stores increasing, and businesses' desire to own and operate their own infrastructures decreasing, IaaS options and Cloud are becoming more important than ever. It's therefore important to choose a provider who is ready to help you move to a hybrid solution, or even pure Cloud model if and when you're ready.





Fill the skills gap

Your IT team may be small, stretched, or simply battling for the right talent in an increasingly competitive environment. So implementing a new technology can feel like a daunting task. But it can also offer a huge opportunity to upskill your workforce in areas that will be vital to your business's future success, from basic data literacy and coding skills in fundamental languages like Python, to more advanced coding skills that will help your people unlock new business ideas in real-time for continuous improvement.

The right provider will offer standard infrastructure tooling that helps install your platform and operate it easily, while also supporting further upskilling, offering initial training and ongoing help once your tech is in place.

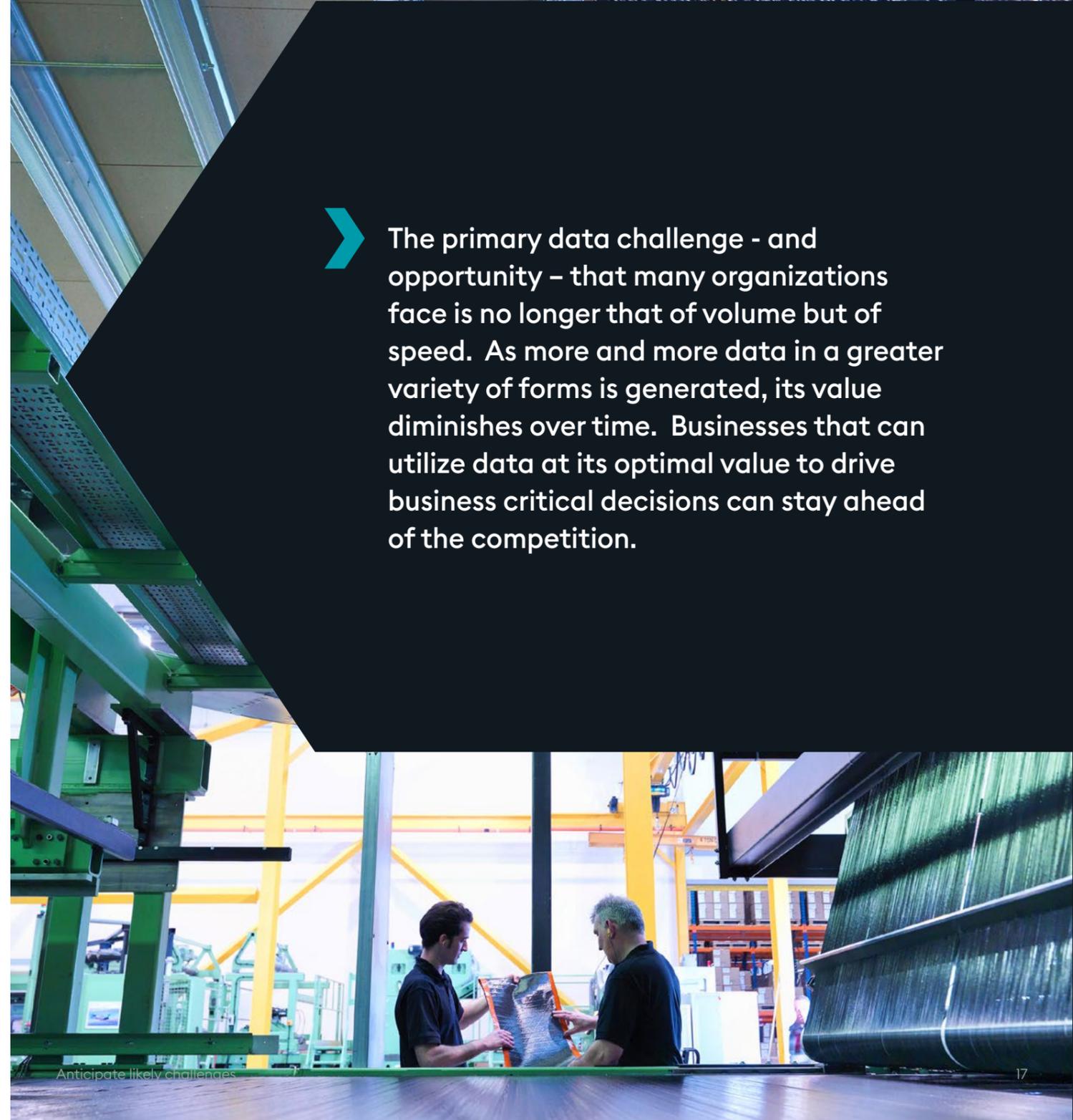
Be clear on time to value

Even if the need for streaming analytics is clear, you're still making an investment. Clarity on ROI and time to value are crucial ways to overcome any challenge related to cost of acquisition, investment and value. Look for solutions that are:

- Proven in multiple industries.
- Data provider and infrastructure agnostic.
- Have solid integration and interop layers.
- Are simple to deploy and maintain.
- Can use industry standard application management and deployment tools like docker and Kubernetes.
- Are performant at scale.
- Can support your total analytics workload in an integrated fashion – streaming data, historical data, mission critical application workloads and data science activities.



The primary data challenge - and opportunity - that many organizations face is no longer that of volume but of speed. As more and more data in a greater variety of forms is generated, its value diminishes over time. Businesses that can utilize data at its optimal value to drive business critical decisions can stay ahead of the competition.



STEP FIVE

Find the right partner



Once you're ready to accelerate your data analysis and adopt a Microsecond Mindset, you'll be looking for a suitable partner. There are a number of vendors in the market, KX naturally being one of them. Here are some key questions to ask when looking for a real-time analytics partner:

Ask about a typical engagement

Streaming analytics goes beyond capturing data to report back in quarterly meetings. So always look for a provider with clear and demonstrable experience in helping businesses to make those sub-millisecond decisions.

Then make sure you're happy with their process. The right provider will seek to deeply understand your business needs (functional and non-functional), design a solution or platform that will really work for you, deploy it and thoroughly test it before it goes into production.



Ask about iteration and future flexibility

Since advanced, streaming analytics is a developing area, your provider should be able to clearly demonstrate how they plan to keep adding value over time. That will of course mean iterating their solution and offering regular updates and upgrades to match market demands – perhaps by improving analytics, capturing new data sources or building brand new data pipelines. All without any downtime.

They will also be able to offer a strategy and solution that can flex with any trends in the market, particularly when it comes to Cloud versus Edge processing. Your provider should be on track to providing both capabilities, and be positioned to work in hybrid environments.

A partner and a provider

Businesses benefit from technology when vendors think beyond the initial sale. And likewise, you should be looking for a collaborative, strategic partner over the years, rather than a one-time buy. Look for partners who:

- Map developments to the market – specifically to industry challenges and pain points like ETL.
- Make their system easy to use and work with right from the off – this will be through the use of standardised, low-code or no-code tools that your people are familiar with and that can be installed in hours. But also through rigorous training and continuous support for any more complex data upskilling you'd like to do.
- Work hard to iteratively improve your solution over time – in any and all of the ways mentioned above.
- Are aware of what is coming down the track – and will collaborate with you to make sure you and your system are prepared and fit-for-purpose. That might be through looking at collaborating with large ISP providers, exploring containerisation and deployment technologies for cloud-native architecture beginning to provide analytics as a service, or readying themselves to work with the continuous intelligence created by 5G, connected devices and the IoT.

CONCLUSION

Ready to adopt a Microsecond Mindset?



The potential of streaming analytics is huge. And creating a Microsecond Mindset will enable your business to use your historic and real-time data in new and innovative ways, making faster, smarter and more valuable decisions.

Getting started relies on realising what value and success looks like for your business, then creating a business case that will bring in the technology to bring that to life.

Here's a recap of how you can foster the Microsecond Mindset that forms the basis of streaming analytics success:

- Assess your business and understand the need for the technology.
- Get your data in shape for streaming analytics.
- Make sure you're clear on the benefits for your business.
- Figure out how your business case will deal with hurdles and setbacks.
- Find out what makes a good partner for your business.

If you'd like to know more about how KX can help you define the benefits of the Microsecond Mindset for you, and to explore our streaming analytics services, get in touch with an expert today.



'At KX, we don't just provide realtime data, we understand that its value increases exponentially when it is combined with historic, at-rest data, and analysed together in the moment. And since our KX Streaming Analytics Platform is the fastest in the world, we're able to do that quicker than any of our competitors.'

Gerry Buggy

Chief Strategy Office, KX



FIVE STEPS TO THE
MICROSECOND MINDSET

For more information please contact: sales@KX.com or visit www.KX.com
KX® and kdb+ are registered trademarks of KX Systems, Inc., a subsidiary of First Derivatives plc.