AI, analytics and **the future of your enterprise.**

Why eGaming leaders
are betting on orange to win.

Foreword.

Every minute of the day millions are made and lost by consumers and firms wanting to profit from the £14.5 billion[1] eGaming market that has grown by over 65%[2] in the past ten years. You know that, you experience the speed and risk every day. However, the boom doesn't end there; with the explosion of mobile betting and gaming over the next five years, there will be even more revenue at stake for you. Yet as the UK government proposes new tax laws and regulations, you are likely to feel the impacts of increased competition and costs of operating in such a fierce market.

With those factors at play, we foresee significant structural change. This could see smaller eGaming firms buckle under increased financial pressure, while larger more established organizations may lever themselves into stronger positions in the fight for greater revenues and market share.

We're here to support you in the battle ahead because your survival and financial success will be dependent on one thing: speed-to-market. The pace at which firms, like yours, can innovate and launch new games, services and apps into market will define their ability to thrive. And in a sector where the customer experience can make or break your bottom line and where transactions and anti-fraud analytics run in real time, data is the winning card.

At Pure Storage we are helping eGaming organizations look closely at their ability to put the vast volumes and varieties of data to use quickly and in ways that drive business advantage. At a foundational level, this can only happen with modern data technologies in place, particularly storage that makes data available with minimum latency, maximum reliability and immediate recovery.

With IT leaders laser focused on supporting innovation, those foundational technologies must come with lightweight management — not the heavy lifting required by legacy technologies so that teams are free to create and develop. Such a data platform must be flexible and scalable enough to support any kind of workload whether on-premises or in the cloud. It must be seamlessly capable of feeding into transactional processes, running back-end systems such as anti-fraud, security and compliance analytics, and acting as the engine oil of application development.

We fully understand the challenges that lie ahead, and in this paper we examine how eGaming firms can take full and immediate advantage of data with the right tools, skills and approaches. Read it to learn how to accelerate innovation in order to turn market risk into a winning streak that rolls on and on. Then please feel free to get in touch with me at **aliston@purestorage.com** to discuss how we can support your ambitions.

Warm wishes,

ANTHONY LISTON // *EGAMING SECTOR LEAD, PURE STORAGE*

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1   *https://www.gamblingcommission.gov.uk/PDF/survey-data/Gambling-industry-statistics.pdf*
2   *https://www.theguardian.com/society/2017/aug/31/uk-gambling-industry-takes-14bn-year-punters*

A smarter world.

Everybody's talking about big data. Huge promises have been made about its role in driving enterprises forward. But few organizations are realizing its true benefits.

For those able to put data to good use, there's much to be excited about. Data is transforming not only businesses, but entire industries, and the world as we know it. Today organizations are harnessing big data to do things like transform healthcare, provide eyesight for the visually impaired, and bringing us closer to autonomous cars:

- AI startup **Enlitic** is using data to help doctors make faster and more accurate diagnosis – allowing for quicker treatment decisions and potentially saving lives.

- **Aipoly** and **Microsoft's Seeing AI** are smartphone apps that use image recognition to help the blind, visually impaired, and color blind understand and interact with their surroundings.

- Another AI startup **Drive.ai** has partnered with **Lyft** on a pilot program for its deep learning approach to self-driving vehicles.

Of course, none of these technologies would exist if not for the 'Big Bang of Intelligence', in which new algorithms, parallel systems and big data came together to unlock a world of fresh opportunities. Together, they are powering the fourth industrial revolution.

Yet for many, the effects of this revolution are still to be felt. Organizations are getting lost in big data – struggling to distinguish the forest from the trees, as they seek to extract useful intelligence. And legacy infrastructure is holding their data back, hindering innovation and wasting precious time and resources.

So how do we move from conversation, to concrete results? Your data is your biggest asset. It's time to get the most out of it.

Executive summary.

Tapping into the power of big data can be daunting. So we've looked at the strategic areas your organization can focus on. Our overview of emerging trends revealed three challenges of big data, and opportunities therein:

1. An overwhelming amount of data to analyze

2. A proliferation of powerful, yet complex, tools and technologies

3. A need for new skillsets and infrastructure built around big data

It's vital that organizations build competency in these areas. The future belongs to those able to get the best out of their data.

We've seen industrial revolutions happen every 50-100 years. With each revolution, those slow to transition have become irrelevant. Today, the fourth industrial revolution is upon us, powered by the rapid rise of artificial intelligence (AI) and data analytics.

To thrive in a new, data-centric world, organizations will need the right skills, approach and tools – including a modern data platform and storage infrastructure. Storage is where your data lives. It delivers data when you need it at the speed of your business. And it needs to be built for the new era of big data.

"The ability to take data—to be able to understand it, to process it, to extract value from it, to visualize it, to communicate it—that's going to be a hugely important skill in the next decades." [3]

HAL VARIAN //
CHIEF ECONOMIST AT GOOGLE

3   https://www.forbes.com/sites/brentdykes/2016/03/31/data-storytelling-the-essential-data-science-skill-everyone-needs/

Data is everywhere.

"Hiding within those mounds of data is knowledge that could change the life of a patient, or change the world."

ATUL BUTTE (MD, PHD) // DIRECTOR, THE INSTITUTE OF COMPUTATIONAL HEALTH SCIENCES, UNIVERSITY OF CALIFORNIA, SAN FRANCISCO (UCSF)[4]

THE CHALLENGE

Data holds insights to some of the greatest business opportunities, but many are overwhelmed by the sheer size of it.

The more data there is, the more complex harnessing it becomes. Organizations face the difficulty of conquering the **Five Vs of Data:**

- The **volume** of data
- The **velocity** at which it must be processed
- The **variety** of data types
- The **veracity** of the data — how reliable or useful it is
- How to extract **value** from data

There's a need to process data from traditional sources (e.g. customer databases and public records) and increasingly, from non-traditional sources (social media, wearables, IoT). This means collecting and getting value from data that is both structured and unstructured.

Structured data is well-organized and easy to analyze with traditional business tools. It's the kind of data usually collected and arranged in databases. By contrast, unstructured data is harder. Social media posts are an example. Tweets or Facebook posts can have huge business intelligence value, but are particularly difficult to analyze. Unstructured data also comes in other forms such as images, audio, video, and variety of text (e.g. word processor documents, emails or instant messages).

90%

of all the data in the world was created in the last two years.[5] In 2016, global internet traffic exceeded one zettabyte for the first time, after increasing five fold in the last five years.[6]

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4 http://sm.stanford.edu/archive/stanmed/2012summer/article3.html
5 IBM, 10 Key Marketing Trends for 2017
6 Cisco, Cisco Visual Networking Index: Forecast and Methodology, 2016–2021

"I realized the model for data analysis had to change on a fundamental level, especially if data was going to continue its exponential growth curve. Businesses needed to analyze data as the avalanche roared in."

ANUKOOL LAKHINA // *FOUNDER OF GUAVUS (A PLATFORM THAT ANALYZES STREAMING DATA)*

Unstructured data[7] is rich with potential, but tricky to handle. Importantly, it makes up 80% of the world's data. Any company serious about big data insights must find ways to harness it.

THE OPPORTUNITY

Faced with an overwhelming amount of data to analyze, organizations should be strategic and focused in their approach. You can't use everything, so don't attempt to. Instead, decide which data will bring the most business benefits and concentrate on that. Align your data strategy with C-level business initiatives to create real value, and differentiation from competitors.

Video streaming service Netflix focused on what gives it an advantage over traditional television networks. With millions of users worldwide, it has rich data on what people enjoy watching. Television networks have more viewer ratings. In contrast, Netflix analyzes what people watch, as well as when they watch it, and where. It also monitors the completion rate of a film or box-set, the moments at which viewership picks up or falls -- and much more.

Netflix uses this data to drive original content creation. If it knows political dramas are popular, it can commission the creation of similar content for its platform – ensuring people remain well entertained and highly engaged as subscribers.[8]

With modern analytics and AI tools, you can overcome the complexity of unstructured data, unlocking new and critical business insights. A recent Aberdeen Group report found that businesses using unstructured data are twice as likely to be satisfied with their data quality and usability.[9]

Finally, the data deluge can be overcome with streaming analytics. Real-time or streaming analytics tools can operate on data as it is received – stripping out unnecessary information at this early stage, so that you can focus on getting insights from the data that matters.

Telecommunications companies have benefited from streaming analytics. They are able to deliver real-time, targeted offers to service users, depending on their location and customer profile. They can detect spam and fraud instantly, and they can use real-time insights to prevent customer churn.

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7   IBM Watson, *https://www.ibm.com/blogs/watson/2016/05/biggest-data-challenges-might-not-even-know/*

8   *https://blog.kissmetrics.com/how-netflix-uses-analytics/*

9   *Aberdeen Group, The Horsepower of Hadoop, May 2016*

AT&T is working towards a "self-healing and self-learning" maintenance model driven by AI. The company already uses real-time insights to track network performance, but it is now using data to predict areas of the network vulnerable to failure. In this way, they can be pre-emptively repaired, saving time, money and ensuring customer satisfaction. AT&T has also begun using drones fitted with cameras to inspect cell towers. The video is analyzed in real-time by technicians, but in the future, machines will analyze this video and recommend any necessary repairs.[10]

10 https://www.techemergence.com/telecom-machine-learning-applications/

Unlocking the power of modern tools.

"The goal of any business analytic tool is to analyze data and extract actionable and commercially relevant information that you can use to increase results or performance. But with so many tools available it can be difficult to know what to use and when."

BERNARD MARR // *KEYNOTE SPEAKER AND AUTHOR OF BIG DATA*

THE CHALLENGE

Data analytics tools are getting smarter. And they're growing in number too. According to Gartner, modern business intelligence and analytics platforms will remain one of the fastest-growing software markets of our time.[11] There's a dizzying amount of technology out there, including:

Machine learning and deep learning tools that train models with algorithms inspired by the human brain. Provided with huge amounts of data, these tools can find patterns and correlations that power useful business insights.

Databases are capable of handling huge datasets. Relational databases store data in tables and rows. Non-relational databases (like those below) store data in a less structured, more flexible manner, and are particularly useful for very large amounts of data.

CASSANDRA	*MONGODB*	*REDIS*

Traditional data analytics and management solutions that organizations have used for years.

MATHWORKS	*SAS*	*TERADATA*

CAFFE2/CAFFE	*MICROSOFT COGNITIVE TOOLKIT*	*MXNET*
TENSORFLOW	*TORCH*	*THEANO*
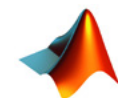
The widely used Apache® Hadoop framework is comprised of:

| HIVE | HADOOP FILE SYSTEM | MAPREDUCE |
| PIG | YARN | |
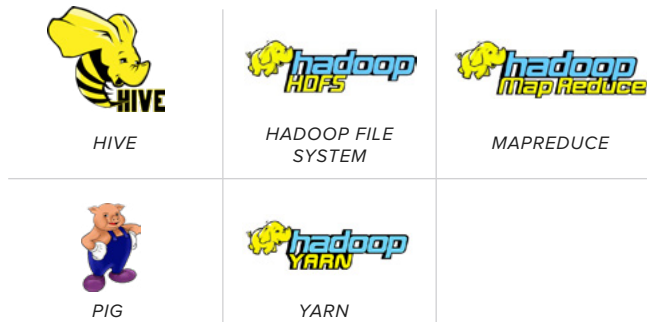
The Hadoop and Spark™ ecosystem and professional services to simplify workflow.

| CLOUDERA | HORTONWORKS | DATABRICKS | AMAZON EMR |

The amount of tools and technologies available is as overwhelming as the amount of data available to be analyzed. It can be difficult for organizations to implement and integrate this complex myriad of tools alongside existing, older systems. For example, legacy storage infrastructure that can't keep up with the compute requirements of deep learning algorithms will slow down innovation.

For many, establishing competency in data analytics and AI, and using them to unlock real, measurable business value, is no easy task.

THE OPPORTUNITY

Don't be overwhelmed into inaction. But also don't fall prey to marketing hyperbole and gain unrealistic expectations of what's immediately achievable either.

68%

of CEOs see data analytics as generating the greatest return for their business – more so than R&D & customer management systems.[12]

Strategic focus and prioritization are key. Decide which business challenges are the most critical to you right now. Select, invest in and incorporate the technology that will best address these challenges.

Investing in the right analytics tools for your business pays off. Companies such as eHarmony, Google and MyFitnessPal have unlocked the power of analytics technology by using it to target key areas.

eHarmony is using Hadoop to deliver more personalized matches to millions of people. By running complex analysis, it is able to create more personalized results. The outcome of this equals increased likelihood of relationship success and ultimately, a better experience for it's members.[13]

Google has modernized its coveted, prized possession – the search engine – with AI. Historically the engine was driven by algorithms – a set of human-written rules which engineers could change and refine. It has now incorporated deep learning into this process. With AI, search algorithms learn on their own, and new rules are generated independently.[14]

12 PWC's 19th Annual Global CEO Survey

13 https://www.cio.com/article/2943599/big-data/how-7-companies-bring-power-to-hadoop-big-data-applications.html#slide4

14 https://www.wired.com/2016/02/ai-is-changing-the-technology-behind-google-searches/

MyFitnessPal, the diet and fitness tracker app, is using Spark for a crucial service offering. The app works through calorie counting, which requires accurate nutrition information. With Spark, MyFitnessPal created an accurate food database with a set of sophisticated algorithms. They now have "Verified Foods". When the app believes a food listing in its database has complete nutrition information, it is marked with a tick.[15]

The opportunities for those who embrace exciting, modern analytics technologies are substantial. These tools thrive on ever-increasing data loads. The more data they are exposed to, the more they learn, and the more insights they gather, transforming businesses and the world we live in.

WALMART is capitalizing on analytics tools to solve practical in-store problems. The retail giant has been developing its own tools at Walmart Labs since 2011, and has recently opened up its own 'Data Café'. Insights as to why products are, or aren't selling can be gained and acted upon in real-time, giving it a competitive edge.

For example, in one particular use case, data analytics showed that a new range of cookies weren't selling in certain outlets. An alert was sent to the team managing these stores. It was soon realized that the products simply hadn't been put on the shelves. Real-time data analysis proved vital in this situation.[16]

15 http://go.databricks.com/case-studies/myfitnesspal
16 https://www.forbes.com/sites/bernardmarr/2017/01/23/really-big-data-at-walmart-real-time-insights-from-their-40-petabyte-data-cloud/#196e541f6c10

THREE
A pivotal moment for action.

"Many are struggling to develop talent, business processes, and organizational muscle to capture real value from analytics. This is becoming a matter of urgency, since analytics prowess is increasingly the basis of industry competition, and the leaders are staking out large advantages."

***MCKINSEY AND CO.** // 'THE AGE OF ANALYTICS: COMPETING IN A DATA-DRIVEN WORLD'*

THE CHALLENGE

It's a defining moment for organizations negotiating the big data revolution. Huge shifts in the way we do business are already underway. Companies must take decisive action to avoid being left behind and becoming irrelevant.

This means core infrastructure change. The following areas must be modernized:

Products and Services – These must be continually innovated and shaped by data insights. Those able to improve their current offering, or create entirely new offerings using relevant user data will thrive.

Personnel and Skillsets – Organizations need analytics teams that will evolve, adapt and remain agile. In a landscape that has come to be defined by disruption, the only certainty for every business is change. In light of this, companies must seek an attitude of creativity and experimentation, over predictability, consistency and accuracy.

Infrastructure (Compute and Storage) – The big data revolution is fueled by modern, parallel systems. Parallel systems allows multiple computational processes to be carried out simultaneously. Large problems are split into smaller ones, and solved at the same time. In this way, insights are quickly unlocked from vast amounts of data. But if your data storage isn't designed for massive parallelism, crucial insights will be held back.

Apps and Tools – As discussed in section two, selecting and investing in the right technology is vital. Look for the areas in your business where data tools could unlock sizeable competitive advantage, and target them with proven analytics solutions.

Restructuring your organization and infrastructure around data insights can feel like a mammoth task. But it's the only way to get the best out of big data.

"No company can hope to fully benefit from analytic insights unless they undertake the hard work of building their internal capabilities for managing data and integrating the insights into operations."

BAIN & CO // INSIGHTS BLOG 'BUILDING IT CAPABILITIES TO DELIVER BETTER INSIGHTS'

THE OPPORTUNITY

Organizations that embrace the use of data analytics to drive business outcomes are more likely to outpace the competition.

Rather than attempting overnight transformation, organizations can use iterative improvements, identify low-hanging fruit, and build on past successes to make business intelligence wins.

LinkedIn is a good example of this approach. When creating the group recommendation feature for the platform, the company started small. A simple program was created to look at members' profiles and make relatively basic suggestions. If a member had attended a particular educational establishment, the program asked if they would like to join the alumni group for that institution. Over time, the program grew to take into account events that members had attended, and other pieces of information. Eventually, it became a larger project – but it didn't begin that way.

The data scientists at LinkedIn started with a modest approach, building on their successes, and adding more and more value over time. An organic, agile and incremental method can create good returns.[17]

When it comes to modernizing personnel and skillsets, having effective data scientists on your team is key. According to DJ Patil, Chief Scientist at LinkedIn, the ideal data scientist is "someone you would start a company with." When building a data science or analytics team, look for entrepreneurial, creative, versatile people. People who are equally at home in the fields of computer science, mathematics, and art.

Similarly, changes to your infrastructure should be shaped by the principles of longevity and future flexibility. Implement technology that is designed to grow and adapt with your organization, and smooth the path for ongoing success.

Since storage is where data – your most valuable asset – lives, it's a pivotal part of the infrastructure jigsaw puzzle. Be sure to get the right piece. It's impossible to predict the data analytics needs of tomorrow. But with a "tuned for everything" storage solution that is purpose-built for modern analytics, you can confidently harness the power of your data.

AMERICAN EXPRESS

is several years into a successful big data journey. As part of this, it's made public the lessons learned and insights gathered along the way. According to American Express, organizations must be prepared to adapt — "Big Data is a mindset," says Ash Gupta, President of Global Credit Risk and Information Management.

They must also be ready to recruit new talent — today's AMEX team has 800 data scientists across the globe. A focus on iterative improvements and an environment open to trial and error are also critical. Finally, speed and agility are needed in today's changeable business environment.[18]

The modern data platform is fast, big and simple.

"Purpose-built systems like FlashBlade eliminate that roadblock, removing the storage infrastructure as a barrier to customers fully leveraging data analytics to move their business forward."

ERIC BURGENER //
RESEARCH DIRECTOR, STORAGE, IDC

In the era of intelligence, data is your most valuable asset. Master today's big data challenges, and your business can thrive in a smarter, faster, and stronger future.

To unleash this potential, you'll need the right infrastructure. FlashBlade™ represents a new class of scale-out storage, purpose-built for modern analytics and AI. It is engineered to be massively parallel at its core, offering unprecedented performance and simplicity for data scientists. Like modern algorithms and compute systems, FlashBlade is parallel, scale-out, lightning fast, and easy to use.

FLASHBLADE IS FAST: Unstructured data is unpredictable- with a "tuned for everything" design, FlashBlade delivers unprecedented performance for any workload

FLASHBLADE IS BIG: Powers terabytes to petabytes of data, replacing an entire datacenter of legacy disks with a solution the size of a microwave

FLASHBLADE IS SIMPLE: Modern analytics is ever-changing and full of complexities- FlashBlade is simple and agile as a cloud service so you can tackle any data effortlessly

For organizations seeking to maximize their data, FlashBlade is the first storage system purpose-built for modern analytics. It powers data analytics for some of the world's largest enterprises, ranging from Healthcare to Consumer Electronics, Genomics to Gaming, Manufacturing to Social Media. FlashBlade sits behind one of the world's most powerful AI supercomputers, fueling the machine learning revolution. Its industry-leading capabilities are in redefining what's possible for organizations worldwide. What can FlashBlade do for your organization?

Find out how FlashBlade can help you unlock business insights today at **www.purestorage.com/analytics**.

10X FASTER SPARK FOR SYSTEMATIC TRADING

"Our quants want to test a model, get the results, and then test another one- all day long. So a 10-20X improvement in performance is a game-changer when it comes to creating a time-to-market advantage for us.

We double our storage needs about every 18 months. And that's a scary prospect. One of Pure's competitors required 4x the rack space of FlashBlade, without the ability to add capacity. FlashBlade significantly improved productivity for the team and accelerated time-to-market for new trading ideas."

GARY COLLIER //
CO-CTO, MAN AHL

3X FASTER SPARK FOR GENOMICS

"Genome Sequencing can be accelerated using FlashBlade as the Data Platform providing improved performance, manageability and scalability."

GET 5X FASTER FOR OIL AND GAS EXPLORATION

"What's truly eye-opening is the potential for performance gains across a scaled system — we don't just expect FlashBlade to get five times bigger, but five times faster, too. In data-intensive, performance-driven industries like oil and gas, there is an increased demand for ever-improving imaging processes. FlashBlade at greater scale will enable shorter delivery time, increased resource productivity and add direct business value."

JIM DOLAN //
*GLOBAL MANAGER OF HPC,
ION GEOPHYSICAL*

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