

**TOP BI TRENDS 2019**

# The Dawn of Postmodern Analytics

**QlikQ** LEAD WITH DATA™

# In the digital age, information is power.

## **Technology is changing faster than most of us can comprehend.**

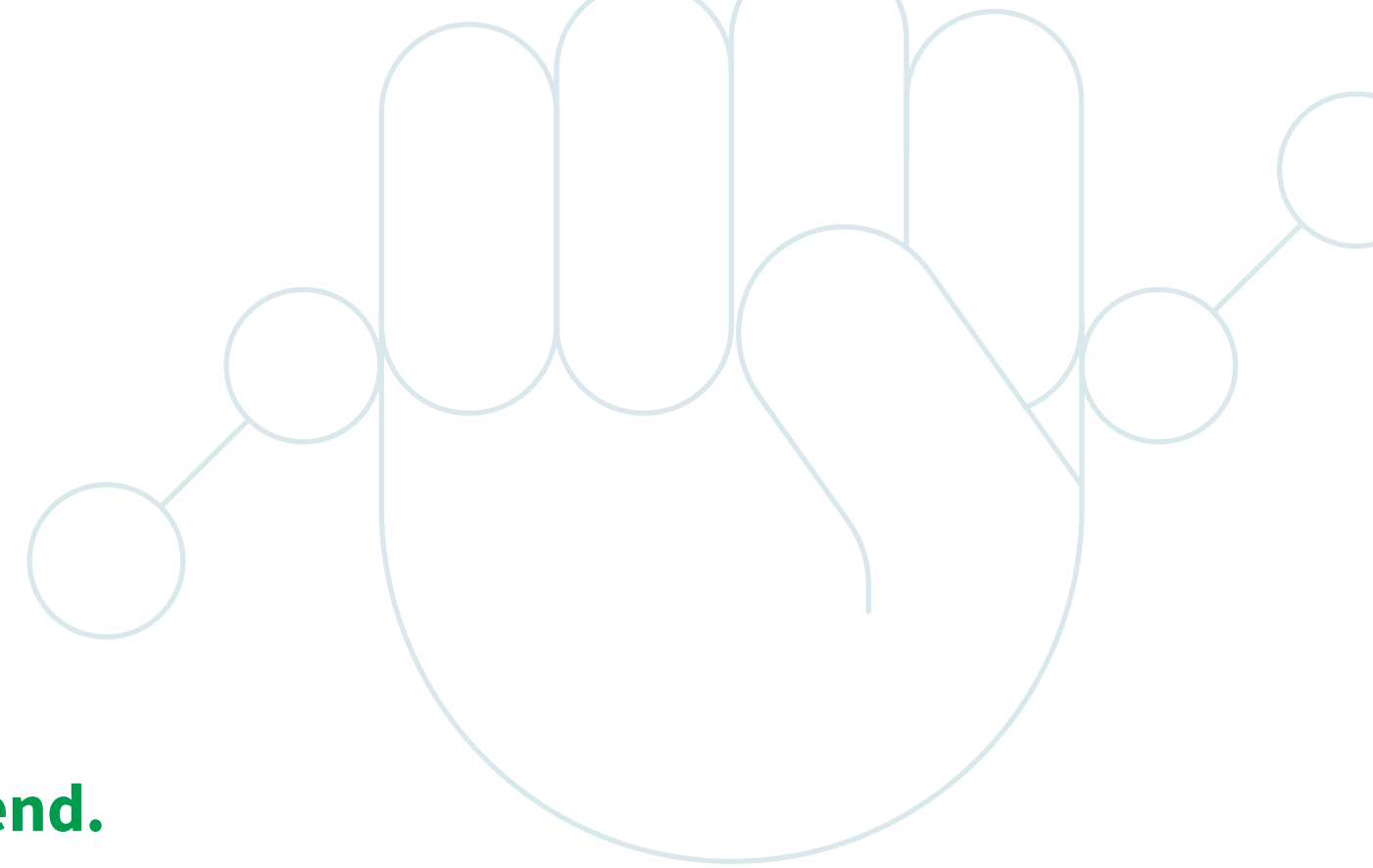
And the changes are impacting us at every level – not only in our personal lives and workplaces but in our communities and the world. In fact, technology is changing the very ways society operates and shaping our future on the planet.

Technology is also creating shifts in power. Hundreds of years ago, power resided in land ownership. With the Industrial Revolution, power shifted to manufacturers. In the data age, power is moving to the organizations that hold the information.

Leading thinkers like Matt Turck<sup>1</sup> and Yuval Noah Harari<sup>2</sup> are raising concerns, pointing out that information is being centralized and

consolidated into fewer and fewer hands. Behemoths like Google, Amazon, Apple, Alibaba, and Facebook are feeding off their hyperscale data centers, participating in the data and AI race, and upending industry after industry.

Now that information is power, it's incumbent upon all of us to establish a level playing field that decentralizes data ownership, empowers the masses, and helps ensure that data is used as a force for democracy, collaboration, innovation, equality, and progress.



# 3 steps to data democracy for all.

How do we get data into the hands of the many? As members of a global society, we must take a three-pronged approach:

1

## **Enact regulations that keep data secure, private, and decentralized.**

GDPR is only the beginning. In effect, we need a new digital social contract that catalogs our rights and obligations when people, organizations, and things are connected by technology. “Gartner predicts through 2023, more than 50% of CEOs of leading digital businesses will openly discuss the impact of technology on society. In fact, 100% of companies leading in digital business will have a societal impact.”<sup>3</sup>

2

## **Create an educated constituency that elects enlightened leadership.**

If we want information to be democratized, we need populations that can understand it and use it. And for that, we need a step change in data literacy. Leaders everywhere – in business, in communities, and in government – should support the growing data literacy movement with resources and policies.

3

## **Build a high-performing technology infrastructure that thrives on networked distribution.**

The next generation of data and analytics platforms must deliver high-caliber performance that can easily scale to the masses, making analytics accessible to all people and all organizations. In the process, these platforms will gain traction, influence, and value through their collaboration capabilities and networking effects.

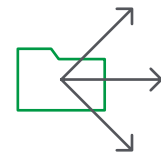
Today’s modern BI platforms have carried us part of the way there. Going forward, we need a postmodern analytic platform built to prevent power from being consolidated in the hands of the few and designed to distribute data, analytics, and insights at the fingertips of the many.

# The 10 Virtues of a Postmodern Analytics Platform

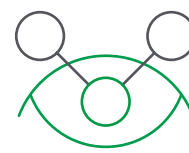
## In the BI of the future:



**1. Multi-cloud, hybrid, and edge will form a continuum.**



**2. Workloads – not just data – will be distributed.**



**3. Centralized data will be replaced by a single view of all data.**



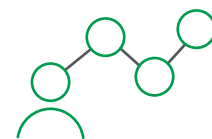
**4. Analytics embedded in the process will reshape the process.**



**5. External innovation will outpace internal innovation by 2X.**



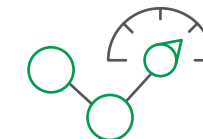
**6. Performance and scale will re-take center stage.**



**7. AI will make analytics more human, not less.**



**8. Visualization, conversation, and presentation technologies will merge.**



**9. Data literacy will become a KPI.**



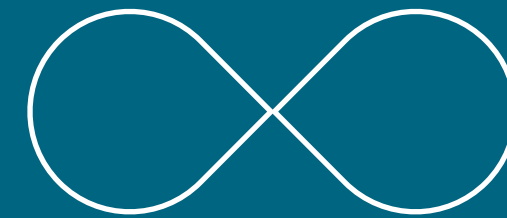
**10. Platforms will evolve into systems.**

# 1 Multi-cloud, hybrid, and edge will form a continuum.

IT leaders are increasingly migrating data to centralized cloud services – and not just their born-in-the cloud data but also the data that’s mission-critical for running their business. The promise of on-demand capacity, low-cost storage, and a rich ecosystem of tools is compelling.

But migrating data should be done with care. Too much centralization with one provider may lead to vendor lock-in, with the associated back-end costs. It may also render organizations inflexible around policies and regulations like GDPR. Beyond data protection, simply managing data in the cloud is different – and if it’s not done right, the cost, complexity, and risk can be extremely high.

The shift from on-premise and legacy data centers should therefore be done at a pace organizations feel comfortable with. A good way to hedge bets is to retain the ability to centrally calibrate and distribute to multiple clouds, together with taking a hybrid approach. We can also expect to see more edge computing; as a decentralized complement to today’s cloud and legacy data centers, it’s often preferred for latency, privacy, and security reasons.



## TREND

**In 2019, platforms will emerge that can handle multi-cloud, hybrid, and edge as a continuum rather than separate efforts.**

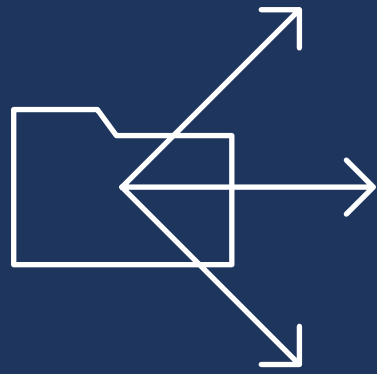
## ANALYST PREDICTIONS

**Around 10% of enterprise-generated data is created and processed outside a traditional centralized data center or cloud. By 2022, Gartner predicts this figure will reach 75%.**

– GARTNER<sup>4</sup>

**By 2022, over 40% of organizations' cloud deployments will include edge computing, and 25% of endpoint devices and systems will execute AI algorithms.**

– IDC<sup>5</sup>



#### TREND

**In 2019 the majority of enterprise architects at leading organizations will view microservices and container-orchestration as critical architectural components of BI and analytics platforms.**

#### ANALYST PREDICTION

**By 2022, 90% of all new apps will feature microservices architectures that improve the ability to design, debug, update, and leverage third-party code; 35% of all production apps will be cloud-native.**

– IDC<sup>5</sup>

2

## Workloads - not just data - will be distributed.

One of the biggest unsung megatrends of today is the rise of microservices and Kubernetes. Microservices are a new approach to application development in which a large application is built as a suite of modular components, or services. Kubernetes is a hugely impactful software innovation that can orchestrate and distribute containerized applications and workloads.

Together, these technologies take what used to be monolithic and disperse it, essentially enabling a new way to scale workloads and a third wave of empowerment. Just like scaling the hardware and scaling the infrastructure before it, scaling workloads will have a quantum-leap effect on spurring innovation.

Kubernetes is a way to access and process data locally and at the edge, reaching beyond where modern BI platforms have been able to go. And software development teams are rapidly adopting it. In the span of a year, Kubernetes has gone from emergent to essential, where enterprise app dev teams are orchestrating container-based applications and demanding production Kubernetes environments.

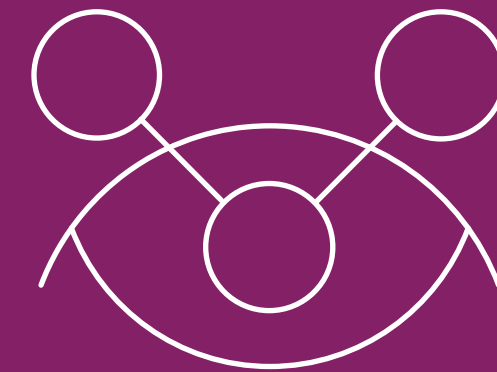


# 3 Centralized data will be replaced by a single view of all data.

Data is coming at us from different directions, at different speeds, and in different formats. Being able to control this tsunami is one of the key markers of empowerment and success in the information age.

For years, we've expended effort on cumbersome strategies for putting all the data in one place – in data warehouses and lakes, for example – but we never truly succeeded. We're seeing similar efforts with the cloud, but these fall short, too, because new data will always be coming in. And while being able to combine and analyze data at the source is necessary to stay agile in our fast-moving world, that approach has historically created data silos and governance problems.

Two massive trends are changing the landscape. First, different vendors are coming together to standardize data models. Cloud-based data sources in particular will have more standard formats. Second, and more important, is the emergence of enterprise data catalogs. These catalogs are accessible in a hub, with one view of the entire federated data estate, and deliver a shop-for-data marketplace experience. The more you share, collaborate, and use the hub, the more valuable it becomes to the business. Furthermore, it links your analytics strategy with your enterprise data management strategy, as the data becomes analysis-ready.



## TREND



**In 2019, focus will shift from bringing all data together into one place to getting a single view of all data.**

## ANALYST PREDICTION



**By 2020, most D&A use cases will require connecting to distributed data sources, leading enterprises to double their investments in metadata management.**

– GARTNER<sup>6</sup>



4

## Analytics embedded in the process will reshape the process.

### TREND

**In 2019, analytics will be more pervasive in the process, ultimately even re-shaping the process.**

### ANALYST PREDICTION

**By 2024, AI-enabled user interfaces and process automation will replace one third of today's screen-based apps.**

– IDC<sup>7</sup>

Embedding analytics into the business process isn't new, but it's now hitting the mainstream. Users want analytics in their existing workflows to make insights more actionable, and they're increasingly asking for insights in real time. This shift is being fueled by machine learning and AI, which provide contextualized insights and suggested actions.

Together, these factors form the foundation of *continuous analytics*, in which real-time analytics will be integrated within a business operation or IoT, processing data to prescribe actions in response to business moments. In the next five years, “intelligent” applications will be ubiquitous.

Gradually, we'll also see analytics begin to reinvent the processes themselves. New technologies like robotic process automation, intelligent process automation, and process-mining will look at digital footprints and further automate or re-shape business processes in a more optimal way. For example, when customers place orders for products online, intelligent applications will analyze patterns and transform processes like receiving, fulfillment, and invoicing to be more efficient and more effective.



# 5 External innovation will outpace internal innovation by 2X.

Internal innovation has the benefit of tight integration; your workforce knows your product better than anyone and has access to the means necessary to improve it. But within any company, the number of people who can innovate around a technology is finite. On the other hand, if you have a strong and open ecosystem, innovation is unlimited.

And that's not the only benefit. The people who sit close to the business problem can be far more effective in providing value tied to their line of work. They can innovate in the way they apply analytics, which isn't possible with a closed BI tool. And the potential for innovation is even higher if you have a development pipeline flowing from the outside in, where extensions that are initially unsupported can become certified and even supported "out of the box."

That's why open platforms with ecosystems allowing partners, customers, and users to co-innovate will gradually supersede closed ones.



## TREND



**In 2019, the market will conclude that open APIs and extensions are a necessity, as innovation from open platforms with ecosystems will outpace those with only internal innovation by a factor of 2X.**

## ANALYST PREDICTION



**By 2022, platform business models will create new market leaders in 50% of all industries.**

– GARTNER<sup>6</sup>



6

## Performance and scale will re-take center stage.

We live in a world of instant gratification, where people expect immediate returns on searches and queries. Yet when it comes to BI tool selection, performance isn't always highly valued. According to BARC, only 23% of respondents who purchased BI within the last two years cited "fast query performance" as a reason to buy, versus 31% of respondents who bought more than two years ago.<sup>8</sup>

In the days of self-service, performance is often overlooked because building visualizations on a flat file doesn't take much horsepower. But many self-service BI solutions (often referred to as "modern BI") crumble when it comes time to scale to more data, bigger workloads, and more users. Performance has also been a bottleneck for distributed Big Data at scale; it's why many Hadoop projects failed to become more than cheap storage. Some organizations have even brought their cloud data back on-premise because of performance issues.

Recently, we've seen breakthroughs via indexing, caching, and pre-preparing very large and distributed datasets. And as companies of all sizes increase their adoption of hyperscale data centers, performance will rise in the selection criteria. Performance becomes even more important in an IoT world, where more and more workloads will run locally or at the edge to avoid latency. In fact, architectures will soon be driven by where performance will be the most efficient.

### TREND

**In 2019, performance and scalability will re-take center stage in enterprise selection criteria.**

### ANALYST PREDICTION

**Through 2028, storage, computing, and advanced AI and analytics technologies will expand the capabilities of edge devices.**

– GARTNER<sup>9</sup>



# AI will make analytics more human, not less.

There is rightful concern about the rise of AI and its potential to eliminate jobs. But in the near future, AI will likely create more jobs than it eliminates. IDC predicts that in 2020, AI becomes a positive net job motivator, creating 2.3 million jobs while only eliminating 1.8 million jobs.<sup>7</sup>

What's often overlooked are two more immediate problems. First, we face a huge gap between the data created and the human ability to process and act upon it. And second, there is also a gap between the availability of today's analytical tools (high), and their adoption within organizations (low).

Both of those gaps can and should be closed. AI can help remove bottlenecks across the information value chain, from gathering the data to preparing it, critically analyzing it with less bias, and presenting contextual results.

With a boost from AI, people will have more time for what they do best – i.e., considering complex problems in context and connecting non-linear dots with the aid of intuition and empathy. Machine learning and telemetry can also capture the power of the collective, which can be fed back in a virtuous loop, further improving and contextualizing the user experience.



## TREND



**In 2019 and beyond, AI designed around people will have a higher impact than AI that takes people out of the process.**

## ANALYST PREDICTION



**By 2020, augmented analytics will be a dominant driver of new purchases of analytics and BI as well as data science and machine learning platforms, and of embedded analytics.**

– GARTNER<sup>10</sup>



#### TREND

**In 2019, we'll see convergence among visual, conversational, and presentation technologies, facilitating persuasive storytelling.**

#### ANALYST PREDICTION

**By 2021, conversational analytics and natural language processing (NLP) will boost analytics and BI adoption from 32% of employees to over 50% of an organization's employees, to include new classes of users particularly in front offices.**

– GARTNER<sup>10</sup>

8

## Visualization, conversation, and presentation technologies will merge.

Those of us who love data find it extremely compelling. But when we try to convey our passion to others, we may share data without context or story, losing our audience. Most people respond far more powerfully to stories than they do to facts. Studies have shown that stories are remembered up to 22 times more than facts alone.<sup>11</sup>

Today, most data stories are told by presentation software. It's insufficient and uninspiring, but as most people master it, they revert to it to get the message across. More recently, we've had the advantage of new visualizations and infographics, but customization has primarily been done by analysts or developers. These two approaches will need to integrate and assist more user-friendly ways of telling data stories, where visual elements can augment data findings.

In the last three years, machine-driven data storytelling has emerged, offering narrations through natural language generation (NLG). Adding natural language query (NLQ) and natural language processing (NLP), often referred to as “conversational analytics,” will make this approach much more interactive and accepted.

Over time, data storytelling, conversational analytics, and presentation technologies will gradually merge. This set of converged technologies will strongly support the broader movement around data literacy, helping users at all levels express data and analytics in more persuasive ways. It will also lead to an overlap in the data analyst and graphical artist roles.

# 9 Data literacy will become a KPI.

The importance of data literacy is gaining traction. But until recently, data literacy levels had been intangible – and, as the classic adage goes, you can't manage what you can't measure. If you want to improve data literacy, you first have to diagnose where you are on a scale. New methods of measuring and indexing data literacy are emerging which will enable organizations to develop workers' skills in a more targeted and contextualized way.

What's even more interesting is that there are now tools available for determining a corporate data literacy score. This is particularly exciting, because early data indicates a correlation between an organization's data literacy and its performance across key performance indicators (KPIs) like gross margin, return-on-assets, return-on-equity, and return-on-sales. That correlation could be the watershed moment for making data literacy a mainstream imperative.<sup>12</sup>

Data literacy is all about raising skills from the bottom up. With data literacy as a KPI, CDOs and other executives can also steer performance from the top-down, as a strategic and differentiating initiative. In the future, having a high data literacy score may also become a factor in hiring.



**TREND** 

**In 2019, Data Literacy will become a key performance indicator (KPI) for the enterprise.**



10

## Platforms will evolve into systems.

The term “platform” has become overused in the market, losing some of its meaning in the process. A true BI platform is far more than a series of tools and artifacts; it’s an organic system in which a number of people in differing roles interact in complex ways that add value. Put another way, individuals *use* tools, but groups of people *participate* in systems.<sup>13</sup>

A postmodern BI system will contain a host of people with differing roles, skills, and intentions. And humans aren't the only participants. Digital services, bots, intelligent agents, extensions, and algorithms also participate. The diversity and sophistication of these non-human participants is set to grow astronomically in the coming years.

It’s the exchanges and learning among all these participants that increase the value of the system, augmenting both the human and machine intelligence within it. An open, self-learning system, containing the nine trends above and improving with further participation, will define the postmodern BI of the future, enabling both data democracy and analytic empowerment.

TREND



**In 2019, platforms will evolve into virtuous systems, feeding off participation.**



# Our job: Leading the data democracy.

In a world where information is power, each of us has a responsibility to stay informed and active, continuing to reach for higher levels of data literacy – and supporting the efforts and the technology that keep data distributed and access democratized.

When we do that, we build organizations that increasingly become cooperative, self-organizing, and robust, thanks to a dynamic collective intelligence. We may also build a world that is more egalitarian and just.

## Ready to get started?

Qlik® technology is designed from the ground up to empower everyone in your organization, no matter what their skill level, to explore data and make the discoveries that lead to transformation. With a truly democratic approach to data management, powerful boosts to data literacy from Augmented Intelligence, and an open platform that enables you to embed analytics anywhere, we offer the next generation of analytics – so you can get the most possible value out of your data and use it to lead in your industry.

**DISCOVER WHAT YOUR DATA CAN DO**

## ABOUT QLIK

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Qlik is on a mission to create a data-literate world, where everyone can use data to solve their most challenging problems. Only Qlik's end-to-end data management and analytics platform brings together all of an organization's data from any source, enabling people at any skill level to use their curiosity to uncover new insights. Companies use Qlik to see more deeply into customer behavior, reinvent business processes, discover new revenue streams, and balance risk and reward. Qlik does business in more than 100 countries and serves over 48,000 customers around the world.



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<sup>1</sup> <http://mattturck.com/Bigdata2018/>

<sup>2</sup> <https://www.theatlantic.com/magazine/archive/2018/10/yuval-noah-harari-technology-tyranny/568330/>

<sup>3</sup> Smarter with Gartner, Why We Need a Digital Social Contract, June 12, 2018, <https://www.gartner.com/smarterwithgartner/why-we-need-a-digital-social-contract/>

<sup>4</sup> Smarter with Gartner, What Edge Computing Means for Infrastructure and Operations Leaders, October 3, 2018, <https://www.gartner.com/smarterwithgartner/what-edge-computing-means-for-infrastructure-and-operations-leaders/>

<sup>5</sup> IDC FutureScape: Worldwide IT Industry 2019 Predictions, doc #US44403818, October 2018 <https://www.idc.com/getdoc.jsp?containerId=prUS44417618>

<sup>6</sup> Gartner, 100 Data and Analytics Predictions Through 2022, 21 May 2018, <https://www.gartner.com/doc/3875982/-data-analytics-predictions->

<sup>7</sup> IDC FutureScape: Worldwide Analytics and Artificial Intelligence 2019 Predictions, doc #US44389418, October 2018, <https://www.idc.com/getdoc.jsp?containerId=US44389418>

<sup>8</sup> <https://bi-survey.com/>

<sup>9</sup> Smarter with Gartner, Top 10 Strategic Technology Trends for 2019, 15 October 2018, <https://www.gartner.com/smarterwithgartner/gartner-top-10-strategic-technology-trends-for-2019/>

<sup>10</sup> Gartner, Augmented Analytics Is the Future of Data and Analytics, 31 October 2018, <https://gartner.com/doc/3892305?ref=shareSummary&refval=4>

<sup>11</sup> Jennifer Aaker, General Atlantic Professor of Marketing, Stanford Graduate School of Business

<sup>12</sup> "The Data Literacy Index: The \$500m Enterprise Value Opportunity Report – powered by Qlik," <https://thedata literacyproject.org/learn>

<sup>13</sup> <https://blog.qlik.com/data-as-an-ecosystem>