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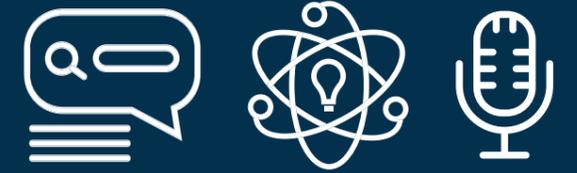
Creating a Data-Driven
Organization in the Era of AI

Foreword

For years, organizations have strived to be data-driven. This eBook explains the opportunities and strategies to overcome challenges with creating a data-driven organization in the current era of AI-driven business intelligence and analytics.



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The
Opportunity
in Becoming
Data-Driven

Why be data-driven?

“Highly data-driven organizations are 3X more likely to report significant improvement in decision-making.”

- PWC

A data-driven company is an enterprise that cultivates the culture of continually using data and business intelligence to make all decisions. All the departments and employees in the company would have access to the data and insights to improve decision making, where the company would encourage everyone to embrace, explore, and examine data in their day-to-day business activities.

The goal of the data-driven organizations should be to reach a stage where the company requires approaching each decision by analyzing relevant data, and the usage of data becomes a natural part of the workflow of all the employees and departments.

A data-driven culture can take the guesswork out of **building** new products and services. It improves **situational awareness** and drives **performance** at individual, team, and department level. It can uncover the **right** audience, **drive down expenses** and gives you **an edge** in even the most competitive of environments.

In short, a culture of being data-driven provides a full **360-degree** view of people, processes, technology, and governance.



“Data-driven” organizations are 23 times more likely to acquire new customers, six times more likely to retain them and 19 times more likely to be highly profitable.

- McKinsey & Company



Of the Fortune 1,000 companies that use big data, the majority employ it (and see value in its ability) to decrease expenses.

- Harvard Business Review

20% - 30%

Data-driven organizations are seeing upwards of 20% to 30% improvements in EBITDA due to unlocked efficiencies and more granular financial insight.

- KPMG

76%

76% of executives from top-performing organizations cited data collection as essential, compared with only 42% from companies that fall behind their peers in performance.

- The Economist

The Rise of AI

We are in the midst of hyper technology change when it comes data, automation, and AI, putting BI and analytics at yet another inflection point.

By 2020, 1.7 megabytes of data will be created every second, for every person on earth. - IDC

Data is being generated and collected at a rate we have never before seen. From IOT, mobile, and personal devices, and even in the enterprise, with every department seemingly having use for data coming from multiple business applications as well as external sources, the movement we used called “big data” several years ago is simply a reality for all businesses.



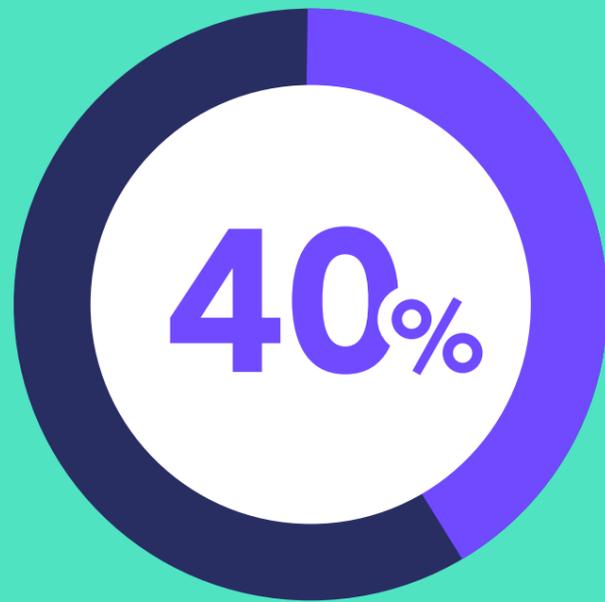
About three out of five people in leadership roles say a failure to get on board with big data could lead to obsolescence.

- CIO Insight

Automation and AI has successfully invaded the home – through smart devices such as Alexa, Google Home, and Siri, that that you can talk to, automation that continuously connects to you to your home such as Nest and Arlo, and intelligent applications such as Amazon and Netflix that anticipate your needs, acting upon, and serving recommendations that you did not explicitly ask for.

Not to be outdone, we are in the midst of what industry analysts have called the third wave of BI, one of augmented analytics and machine-driven intelligence. This generation—which follows on the heels of ad hoc reporting (first generation) and self-service analytics (second generation)—promises to greatly simplify the use of analytics and hence rapidly increase levels of adoption, insight, and fact-driven behavior.

Challenges to becoming data-driven



"40% of the insight delivered by customer intelligence teams are not actionable."

- Forrester

The benefits of AI-driven business intelligence can only be fully realized if organizations recognize and tackle the challenges in their path to becoming data-driven.

- **Limited access to data**
Data is often locked away in silos or protected by individual departments. This is the antithesis to what a data-driven organization should be – which is entirely open and collaborative. Employees shouldn't be concerned about gatekeepers to data – there must be a move towards working together – department with department.
- **Over-reliance on data specialists**
Some organizations heavily rely on analysts, who in turn, are drowning in a sea of report requests that are backlogged – causing delays to what could be time-critical decisions.
- **A deepening talent crisis**
Data scientists are in high demand, but are in short supply - **data science skills shortages are present in almost every large U.S. city - McKinsey.**
- **Low adoption of BI**
There remains a lowly 20% adoption of self-service tools – behind which is a perception that these tools are difficult to use, and that they lack enough depth for many users.
- **A prevalent cultural bias**
In some organizations, business leaders, managers, and employees alike have, for years, endured in their position by leaning on their experience and relying on intuition. The shift from intuition to being data-led can seem like a monumental task. There can be data trepidation at best, and mistrust at worst.
- **Black box AI**
Misunderstandings around how AI works leads to widespread mistrust of algorithms. Compounding this issue is the lack of transparency and explainability that users face when they seek to understand recommended business decisions that are automatically generated.

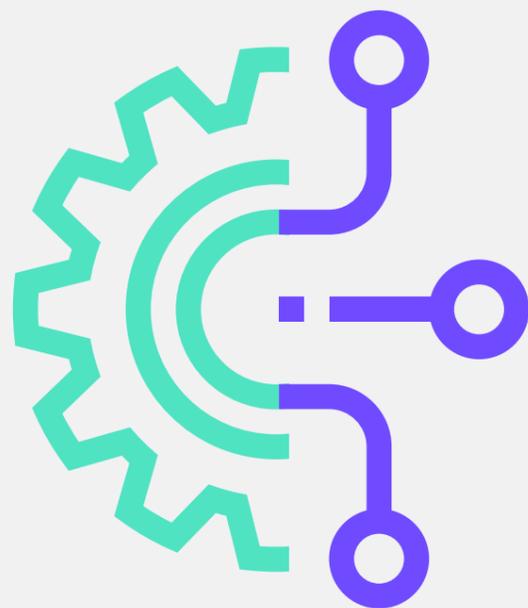
The opportunity

The huge leaps and bounds that can be made by AI revolve around one simple, fundamental strength of AI – it can **bridge the previously vast gap between the data and insights**, with those who need to understand it.

Users can analyze more data, faster – **speeding up discovery** of insights and, consequently, the business decisions made from those insights.

Data democratization can take hold, whereby anyone can ask questions in **natural language** – where once they would have had to deal with cumbersome reports and clunky processes. Findings can be **presented automatically** (no longer will monthly meetings be based on out-of-date (and often irrelevant) data).

AI-driven BI platforms go hand-in-hand with **flourishing data literacy**, and users who become increasingly adept at consuming data through natural language generation.



In this eBook, we explore the ten steps towards advancing a data-driven organization through their analytics journey. Along the way, we'll be sharing forward-facing insight into how AI-driven analytics could and should help you create a deep-seated data-driven culture.



1. Foster Inquisitiveness

The data-driven organization thrives on people asking questions and exploring new ways for sometimes age-old processes and problems. This culture needs to be not only top-down, but also bottom-up, so it's not just execs demanding data, but also individual contributors asking about performance in order to determine ways to improve.

It's imperative that objectivity is corporation-wide.

Everyone must move beyond asking only the questions that they know, or expect to know, the answer to. It's a human infirmity to be biased (and sound correct all the time), which leads to people seeking out the data that will support what they expect to be the correct conclusion.

Inquisitiveness - The hallmark of a data-driven organization.



"The important thing is to not stop questioning. Curiosity has its own reason for existing."

- Albert Einstein

Humans are naturally inquisitive. The very first online search engine launched in 1990, and it was positively archaic, but it was in such demand that it couldn't be used during the day. Few could have predicted just how many questions people wanted answers to. Fast forward to today, and we now live in a time of 40,000 Google search queries **every single second**.

Analytics leaders are taking active steps to support their organizational inquisitiveness.

It's no longer acceptable that a meaningful, relevant question is met with the response of:

"Don't ask that question."

"We don't have the data."

"That'd be impossible to figure out."

The Need for BI Search

In the age of AI, leaders must now wholeheartedly embrace newer and easier ways for people to interact with data. They must create the foundation for inquisitiveness. By adopting BI search combined with natural language query, everyone can tap into a Google-like search experience – receiving equally fast answers and data visualizations far easier than in generations past. AI-driven BI smashes through the barrier that previously stood in the way of understanding data to get the answers people seek.



2. Focus on Data Quality



“Data scientists spend 80% of their time preparing and cleaning data.”

- CrowdFlower



Data is the new oil (and it's just as messy)

Data Quality is a Priority

Data quality is essential in the age of AI. The phrase “garbage in, garbage out” has not been more relevant than today. The ability of AI to perform accurately and generate meaningful conclusions is heavily dependent on the data that is given.

This data quality issue is so important that data scientists cite that the majority of their time is spent in preparing, cleaning, and organizing data for analysis.

So while organizations want to get to the “fun stuff” – whether that is building machine learning models, discovering hidden insights in their data, or generating visualizations for the broader organization – you often have to wait for the data to be ready.

But Don't Sacrifice the Need to Experiment

While the scientific approach demands a level of rigor that asks for data of the highest quality, organizations must balance this with the many real-world challenges that come with experimentation in a business setting.

Analytics leaders must determine at what point these data quality exercises place a stranglehold on the organization's ability to experiment and discover conclusions from the data. You should examine closely how long data quality issues are delaying analytics initiatives and prioritize your datasets that will get to the end result faster.

In some cases, if you choose to experiment with dirty data, it may not be until you begin analysis of said 'unready' data that you could discover what data is truly the priority for cleansing.



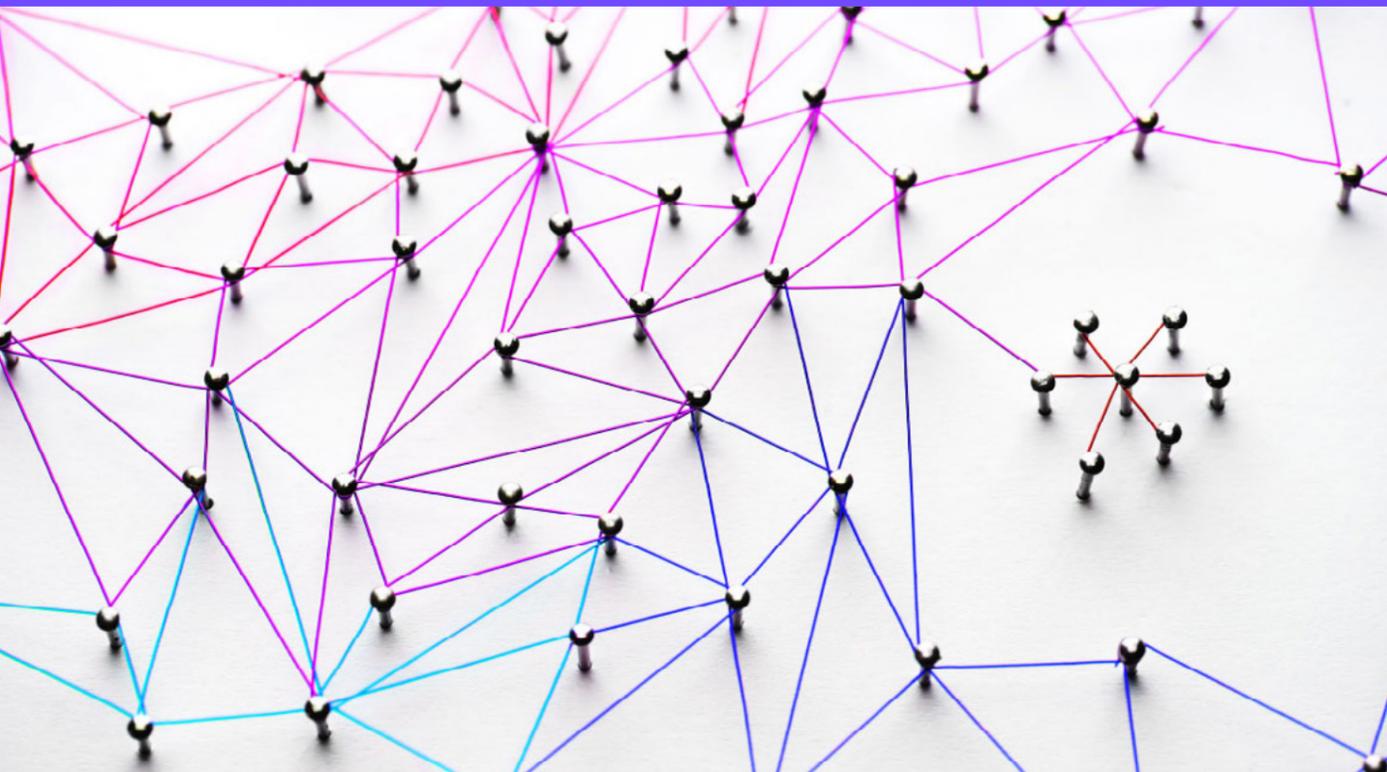
3. Break Down Data Silos



“More than 80% of marketers say that data silos within marketing obscure a seamless view of campaigns and customers.”

- Teradata

When it comes to data, if employees do not have access, then your organization is **going nowhere**.



Democratize data access

In today's world, enterprise data comes from many different places, get stored in different ways, and takes many different shapes -- data silos are only increasing. But data-driven organizations and AI thrive on more data and demand that these silos must be broken. It is imperative that enterprises share data across employees, teams, and departments in order to build a more complete picture of the business and uncover the story that is truly rich in context.

Data is capable of providing a full perspective of your business – offering context on customers, transactions, engagement, marketing and supplies – and the ways in which they interact with one another.

The more of your data you analyze, the richer the story of your business.

Let's say your business wants to know who your most loyal customers are. The sales department says, with confidence, that it is customers in a handful of specific cities. The marketing department says, with equal confidence, that it is those who connected on a specific marketing campaign. Finally, the service department tell you, in no uncertain terms, that it is related to customer transactions and times they contacted the support center.

Why are there such competing opinions? More importantly, who's right?

It's possible that they are all correct when they are just looking at their (very limited) slice of data. Yet when all this data is combined, the cross-demographic/behavioral analysis will arrive at an answer entirely different to all three.

The Power AI-Driven Analytics

Where once BI and analytical systems struggled to handle this amount of cross-departmental data (even if it were available), today AI, machine learning, and data at scale form together as the perfect storm for massive data analysis faster than ever before. No longer do analysts face manually combing through the data to analyze every permutation of data combinations by hand. AI-powered systems now scan multiple data sources and serve up insights far faster than even the largest of human analyst teams could achieve alone. And most importantly, virtually anyone at the company can access these insights through natural language interface.



4. Deploy Augmented Analytics

AIU 1,822 (-35)	HJI 20,369 (+580)	WWE 890 (-20)	PLD 6,350 (-200)	EER 10,985 (+580)	QRT 665 (-15)	OPY 6,800 (-115)
MBC 3,605 (+210)	LJH 9,542 (-128)	MJB 2,609 (+35)	PON 7,654 (+169)	NFR 6,522 (+122)	UGH 1,632 (-54)	OMJ 3,652 (+182)
YBV 3,204 (-33)	QMN 5,211 (+156)	MMJ 7,100 (-60)	IIT 7,150 (-150)	KLM 782 (+74)	CCX 1,901 (+101)	EMH 3,280 (-120)
MBB 3,320 (-120)	WFF 712 (+12)	HJM 134 (+5)	QLC 2,022 (-18)	LSD 631 (+40)	SDH 6,287 (-57)	GHS 12,630 (+330)

“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, *Augmented Analytics is the Future of Data and Analytics*

Augmented analytics is currently disrupting the world of data and analytics. This category of analytics technology leverages machine learning and artificial intelligence to transform how analytics content is developed, consumed, and shared.

A key feature of augmented analytics is how it will enable users to discover the most vital insights or changes within their area of the business, without data science and machine learning knowledge. So intuitive will these systems be, that they'll look and feel very similar to AI- and voice-driven automated systems that we are increasingly becoming accustomed to engaging in an informal, conversational way.

Novice users will be able to gain advanced intelligence without the advanced skills, while those with the advanced skills – the data scientists and business analysts – will be free to focus on more high-value tasks.

Companies that fail to embrace new ways of leveraging machine learning and artificial intelligence (AI) are fated to be left behind by those that do.



Analytics leaders must now focus on four key tasks...

1 ...>

They must explore the opportunities to combine existing data and analytics with a pilot of augmented analytics that focuses on high-value business problems that currently demand time-consuming, manual analysis.

2 ...>

They should begin to build trust within the systems of today (and tomorrow) by teaming up novice users with expert data scientists – who together should step through problems to prove tangible value.

3 ...>

They should monitor the augmented analytics capabilities and roadmaps of established data and analytics providers, enterprise application vendors and startups. Assess upfront setup, data preparation, openness and explainability of models, the number of variables supported, range of algorithms, and model accuracy.

4 ...>

They should put a strategy in place for evolving roles, responsibilities and skills – into which investments in data literacy should be made.



5. Expand Self- Service Analytics to New Heights

“Data in the hands of a few data experts can be powerful, but data at the fingertips of many is what will be truly transformational.”

- Brent Dykes – ‘Why Companies Must Close The Data Literacy Divide’



For many organizations, self-service analytics is seen as the holy grail. Enabling users to not only access data but perform their own analysis is both powerful and liberating. But despite the need for self-service and proliferation of visual analytics tools, adoption of self-service BI still stands at around 20% of any organization.

The Age of AI presents a unique opportunity for not only a huge leap in adoption, but also a huge expansion in capabilities.

Data Access with BI Search

Business users will no longer be confined to just the operational dashboards created for them or the pre-defined drill paths for slicing-and-dicing. With AI-enabled systems bringing natural language interfaces for querying data and generating narratives of analyses, business users will find ad hoc data exploration far more intuitive and gain unfettered access to being able to answer new questions on their own.

Advanced Analysis Through Automation

Data analysts can now go beyond Excel and visualizations tools for their analysis. AI-enabled tools incorporate algorithms and machine learning models that make data analysis exponentially faster. Answering the why behind the what becomes far easier through the automation of advanced analysis for larger and wider data sets.

Growing Citizen Data Science

With automated machine learning, building predictive models is made more accessible to those without degrees in statistics or background in coding. With this capability of no-code or low-code machine modeling, data analysts can take their skills to the next level and advance the data discovery process without to wait on data scientists.



6. Level Up the Workforce

“Spending on big data and analytics products is expected to eclipse \$200 billion by 2020, up from \$150 billion last year, according to IDC. To get the most from these investments, companies must educate their employees to use data properly.”

- Doug Bordonaro, InfoWorld



In the age of AI, analytics can have an immense impact on people throughout every level of an organization – even more so than operational dashboards for executives, or visualization tools for data analysts.

While data literacy has been a hot topic recently, the modern data-driven organization includes leveling up those with zero data skills as well as everyone across the enterprise. AI makes data analytics easier and more accessible for all, accelerating insights for new generations of knowledge workers, especially when data is embedded into everyday business workflows.

Everyone ‘levels up’ their game with AI...



Business users include executives and staff workers, sometimes (but not always) non-technical users

AI-enabled analytics makes data far more accessible and intuitive to use, so true ad hoc query can finally be realized. Automated analysis driven by machine learning provide insights that people in the front lines usually have to wait days for. Now, these users can quickly level up their analytical prowess and, with the right guidance, eventually level themselves towards developing analyst-like skills.



Analysts are typically responsible for performing data analysis, answering deeper questions from the business, and building reports and dashboards for everyone else to consume

With the emergence of AI and automated machine learning techniques becoming ever more popular, data analysts level up by educating themselves on machine learning techniques – in many cases, learning to code models in R or Python or using machine learning platforms to build models without coding.



Data scientists are considered the experts in analytical rigor and statistical analysis

They are tasked with applying their skills in specific business domains to solve problems or give a new perspective in the departments in which they are embedded. Levelling up data scientists is not so much about technical ability, but about learning the business, and thinking about new ways to provide business value to their collaborators.



7. Accelerate Small Wins and Scale

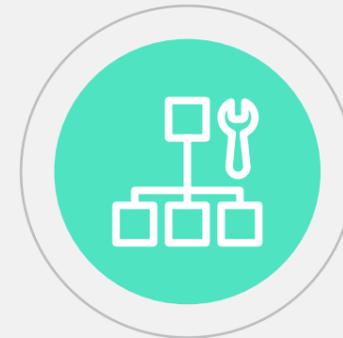


Ready to get started?

Focus your efforts in areas where the most impact can be made, learning from the process before scaling up into broader areas.



Let's make your first move in the era of AI a success whether you're using AI-enabled software tools, integrating data scientists into the business, or a combination of both.



With AI-enabled tools, you should focus on a set of users along with specific datasets – this helps you understand the potential impact to the department and what types of insights can be produced. Depending on your organization, data engineers may be called upon to provide the right data and/or data specialists can be referred to validate the insights found by machine learning.



With data scientists, you should focus on a single set of problems in a department. They embed themselves into the business and become intimately involved, learning how the department functions and what issues they face. You want a cross functional team that spans from business to data analysts who'll work alongside data scientists.

Whichever route you take, you should always prove yourself in specific, measurable ways to make the case for growing adoption to the broader organization.



8. Defeat Data Bias

“Our world is awash in data, and data is not the same thing as facts... While data seems to promise objectivity, instead it requires analysis — which is replete with subjective interpretation.”

- Sam Ransbotham, MIT



What's your bias?

Building a data-driven organization in the modern age means overcoming the many biases that individuals have against simply using data or using data in an objective manner.

The first challenge is cultural bias.

In some organizations, data is a dirty word. Business leaders may rely on their expertise that they have gained over long periods of time and want to rely on their intuition to make business decisions. This may be the toughest type of obstacle to overcome. Here, people may be afraid of using data and be fearful of AI and the implications if their authority and expertise were being called into question.

The second challenge is human bias.

Sometimes, people use data to find or justify the answer that they are looking for – whether intentional or unintentional, for political reasons, to look good in front of others, or for other reasons, the analysis becomes biased. Other times, bias is introduced when people only analyze a subset of the data instead of the data they have access to, whether they lack the technology to look at all the data, or under time pressure so resort to only looking at the data they are familiar with. Whatever the case may be, it leads to conclusions that don't reflect the real situation.

The Case for AI-Driven Data Analysis

AI gives people the ability to analyze much larger data sets in a shorter time period. No longer are they constrained to working with narrow views of data that they are accustomed to and comfortable with. In being objective, and by utilizing larger data, you are led to conclusions that could have been entirely overlooked previously.

At its core, science is about generating hypotheses, and testing those hypotheses through experimentation and objectivity - collecting data in order to draw a conclusion. When a culture of experimentation runs through an organization, the journey of discovery is defined by openness to discover things that may not have been expected.

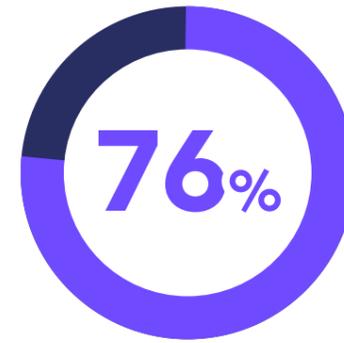
AI-driven BI enables you to build a series of small conclusions at speed – iteratively testing hypotheses and being led to conclusions that add value, aid decision-making and guide performance improvements throughout the organization – top-to-bottom.

The foundation of science is objectivity.
The growing prevalence of data science is
bringing this fundamental to the fore.



9.
Build Trust and
Transparency
in AI

AI is non-deterministic and difficult to understand.



“76 percent of respondents said potential for biases and lack of transparency were impeding AI adoption in their enterprise. Seventy-three percent said the same about the need to ensure governance and rules to control AI.”

- PwC CEO Pulse Survey

People have many reasons for not trusting AI.

First is that AI is non-deterministic and difficult to understand. Unlike traditional coding practices, where the rules are written in code, algorithms draw a conclusion, make a recommendation, and discover some insight simply by processing data presented to it. And in the cases of advanced algorithms such as neural networks, they are opaque at best in their transparency.

The second reason is that AI is expected to disrupt the workforce. The World Economic Forum estimates that as many 75 million jobs to be displaced globally, so despite the anticipated 133 million new roles to emerge that are more adapted to the new division of labor between humans, machines, and algorithms, dramatic change does stir fear in the minds of many workers.

The third is that algorithms can learn to be biased, by being trained on insufficient or biased data to begin with. There have quite a number of published cases where AI generated conclusions that were deemed to profile people along racial and gender lines which were incorrect or that go against legal regulations. With the ability to draw conclusions at speed and scale, this makes some people uneasy.

There are a few strategies for systems and processes to build trust in AI and counter the idea of menacing ‘black box’ systems that could do more harm than good...

First is **transparency** into the algorithms that generate insights of the behalf of users. This allows users to describe to the broader organization what models are being used and acquire an in-depth view into how the automation works.

Next is **explainability** of the insights so users can visualize and interact with the conclusions being drawn. For example, if a model concludes that one group of customers is more likely to be upsold compared to another, then it only makes sense that the attributes of these groups are made very clear, and can see how they compare to other, less responsive groups.

Visibility into data is also vital so someone can inspect the incoming data to ‘see for themselves’ what data is used for analysis – users can touch and feel it. They would know where the data comes from and how it’s prepared or transformed.

Finally, users should be able to customize algorithms and assert some kind of **override capability**. This way, users can shape the data used for analysis and assert their business expertise in ways that help AI be a partner to the business.



10. Evolve Your Analytics Center of Excellence

For organizations of all sizes and industries, The Analytics Center of Excellence has proven essential for centralizing and sharing learnings of BI and analytics programs.

The Analytics Center of Excellence becomes ever more essential as the technological landscape continues to shift and reshape. It's also vital to understand that it is much more than just simply giving data science a seat at the table.

"In the past, a lot of S&P 500 CEOs wished they had started thinking sooner than they did about their Internet strategy. I think five years from now there will be a number of S&P 500 CEOs that will wish they'd started thinking earlier about their AI strategy."

- **Andrew Ng, computer scientist, executive, investor, and entrepreneur**



"The analytics center of excellence is a team of business and technical people that can be internal, external, and even crowd sourced. They have some centralized capabilities and also some distributed capabilities and resources, creating a common (online) workspace where they share methodologies, tools, models, and techniques. The objective is to gain efficiency and be able to implement initiatives across to the different business units."

- **The O'Reilly Data Show Podcast: Transforming organizations through analytics centers of excellence**

Moving on – Three core challenges before a Center of Excellence can perform as it should

Companies continue to grapple with how they can adopt big data at a large-scale corporate level. In all too many organizations, there's a sizeable gap between the launch of departmental products, and being able to apply the system corporation-wide.



To overcome this sticking point, there are three issues that must be resolved:

1



A lack of skills across the organization

2



Lack of standards, methodology, and governance

3



Lack of use cases prioritization

“Every large enterprise on the planet today has a Center of Excellence for cloud and mobile. AI will be no different.”

- Ayasdi



The Final Word

The Age of AI has arrived. For those that embrace the opportunity to transform into a truly data-driven organization, unparalleled opportunity awaits – faster, smarter, more accessible intelligence, for all. For everyone else, there exists only the inevitable prospect of falling behind.



Search and AI-powered Analytics for the Modern Age

At Tellus, our business is busy delivering what you've always expected from BI, but never received. You see, we've always thought that there was a better way – more natural way. Business intelligence should be a whole lot smarter and easier to transform decision making for everyone in the enterprise.

