

FROM ANALYTICS TO AI: Making smart business decisions by unlocking the value of your data

ORGANIZE

ANALYZE

INNOVATE

TRANSFORM

A guide based on lessons learned from our analytics journey and the road to artificial intelligence

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JOURNEY



The proven value of analytics

Analytics holds tremendous potential for organizations that want to dramatically grow their revenue and control their costs. Companies that can successfully harness the ever-increasing amounts of data from diverse sources can go far beyond traditional descriptive analysis (*what happened*), to predictive analysis (*what will happen*) to prescriptive insights (*what we should do*) to automated action (*AI*).

These successes with analytics pave a path to artificial intelligence and a wide range of use cases that use techniques like machine learning and deep learning to improve operational efficiency, enhance the customer experience and inspire new business offerings.

Data drives business opportunities

The IT department plays a critical role in your organization's efforts to effectively harness the full potential of the data collected from a growing range of sources. When you implement an analytics infrastructure solution, you enable business units to collaborate more effectively, breaking through past boundaries and eliminating duplication of efforts.

In this process of transforming your organization's information structure, your IT department gains stature as an expert consultant and trusted provider to the business. United in purpose with the business side, you form a partnership that fosters success for your organization.

ORGANIZATIONS THAT IMPLEMENTED AI INTO THEIR OPERATIONS HAVE REALIZED...

Significant operational efficiencies, including:

- 39% increase in IT productivity
- 92% reduction in downtime
- 19% lower cost of business operations
- 23% increase in sales productivity

Source: Dell Technologies

Notable revenue gains, including:

- 34% increase in revenue
- 36% more sales-deal wins
- 74% more sales deals developed
- 5% increase in sales deal sizes

Source: Dell Technologies

Boosting productivity

Customers report Dell Technologies solutions help **boost data scientist productivity by as much as 30 percent.*** IT operations are also simplified through a single console for monitoring the health and configuration of the cluster.

* Source: Forrester Research commission by Dell Technologies, "The Total Economic Impact of Dell EMC Ready Solutions for AI, Machine Learning with Hadoop," August 2018.



If you're struggling with how to best build out your IT infrastructure to enable analytics,

We understand

When we began our transformational journey, our goal was to drive greater business efficiencies and revenue opportunities. We were determined to capture the lessons learnt to both innovate and push our customers' unique journeys forward. We've done it for many and can help you too.

BEFORE

Multiple data sources

Data was spread over legacy systems, resulting from rapid organic growth and more than 80 acquisitions.

No master-data management

IT controlled the reporting environment — one that had multiple, siloed data stores and no master-data management. This led to “shadow IT” and limited governance.

Bottlenecks to business needs

Because IT served as the corporate gatekeeper of information, business units needed IT help to run reports — slowing time to results.



AFTER

Consolidated data repository

Now, we have a consolidated data repository based on an IT-supported platform that facilitates business analytics.

Collective or individual access to data

While IT controls the data from a central location, the businesses can access information individually or collectively — sharing it across lines of business.

Greater IT and business agility

With a well-structured IT infrastructure, the delays are gone. Instead, the IT department helps address the business units' real-time needs with both predictive and prescriptive analytics.

SLASHING TIME-TO-VALUE

A Forrester study found that Dell Technologies solutions made implementation of a Hadoop environment relatively quick and easy. Organizations speculated that if they had tried to implement on their own, it would have taken **6 to 12 months longer** to hire the expertise, figure out the correct configurations and deploy the platform.*

*Source: Forrester Research commission by Dell Technologies, “The Total Economic Impact of Dell EMC Ready Solutions for AI, Machine Learning with Hadoop,” August 2018.



This guide describes milestones we have passed and lessons we have learned in our analytics journey. You'll find actionable information for each milestone of the journey to help you...

WHAT TO SAY

Communicate

the details of what's happening and why



Direct the technical actions

needed for success

Benefits for your organization

The benefits of data analytics solutions are as different as the organizations using them, as demonstrated by clients who have worked with Dell Technologies to construct effective ways of understanding their data. Let's consider a few customer case studies.



THE OHIO STATE UNIVERSITY

Dashboards for informed decision-making

With data analytics tools including visualization, this team created a series of dashboards that stream multiple data flows to help parents, school leaders and public health officials make informed decisions on safe learning modalities — virtual, in-person or hybrid — to help prevent the spread of COVID-19. Dashboards reflect patterns in monitoring data at state, county and local school-district levels across 21 school districts in Central Ohio, serving approximately 1.4 million residents and 238,000 children during the COVID-19 pandemic.

[Read more >](#)



mastercard.

Stopping card fraud in its tracks

To identify and stop fraudulent payment-card transactions, Mastercard leverages machine-learning algorithms running on Dell Technologies systems to process large data sets nearly instantaneously. This capability helps Mastercard combat fraud without disrupting or delaying legitimate transactions. This is particularly amazing when you consider the scale of Mastercard's global operations. The company processes 165 million transactions per hour, using machine-learning algorithms and applying 1.9 million rules to examine each transaction — and it all happens in a matter of milliseconds.

[Read more >](#)



Giving hope to children with rare cancers

Speed is essential in the fight against diseases. Families need answers. People need treatment — sooner, rather than later. These are among the goals of the Translational Genomics Research Institute (TGen) and its Center for Rare Childhood Disorders. Drawing on the power of AI and machine learning, TGen's precision medicine explorations bring better treatments to more patients. The institute takes discoveries in the lab and translates them into treatment quickly and effectively. This work requires the manipulation of massive quantities of data processed.

[Read more >](#)

Gartner estimates that in 2021, AI augmentation will generate **\$2.9 trillion** in business value and recover **6.2 billion hours** of worker productivity.*

Any organization can benefit from the power of analytics

A note of caution as you start

As you begin your technology journey, be aware that the route to data analytics takes time, resources, planning and — most of all — cooperation between the business and IT sides of your organization.

Your first step should be developing a strategy that supports business objectives with a well-considered IT infrastructure. **To do that, you'll need to initiate a conversation between business leaders and IT leaders to reach agreement on an overall direction.** The key is to mutually determine what you are going after, what data is relevant and what business problems you are trying to solve.

Business leaders

need to answer such questions as:

- What business problems can we solve with analytics?
- What use cases can we target in which benefits will outweigh costs?
- What does success look like?
- How would we quantify that success to ensure significant ROI on our time and resources?
- What is the potential revenue increase or long-term cost savings to the company as a result?

IT leaders

need to answer such questions as:

- What are the relevant data types to focus on?
- What infrastructure would support our main objectives?
- How many people will need to be involved?
- How should we time the deployment of the infrastructure elements?
- How simple or complex do we expect the implementation to be?

If you are not building something aligned to business needs, IT becomes a barrier to analytics-driven business benefits, as opposed to an enabler of success.



Navigating the 4 milestones in the analytics infrastructure journey

As your organization progresses in your technology journey toward successful business transformation via analytics and artificial intelligence, you will reach four milestones, each with distinct activities.

MILESTONE 1

ORGANIZE

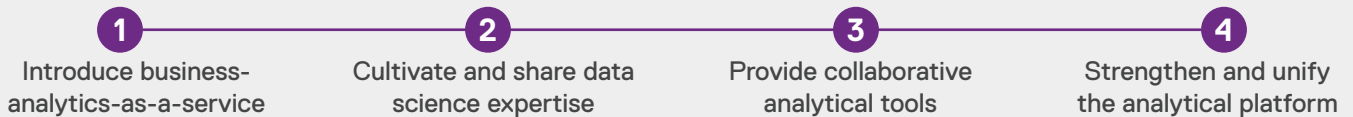
You begin by pulling together all the data sources in a way that sets up the organization to effectively use that information across the enterprise.



MILESTONE 2

ANALYZE

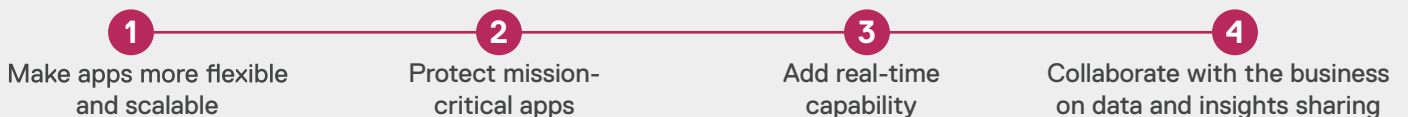
Once the information is in place, you set up methods of letting business units access the data, with support from IT.



MILESTONE 3

INNOVATE

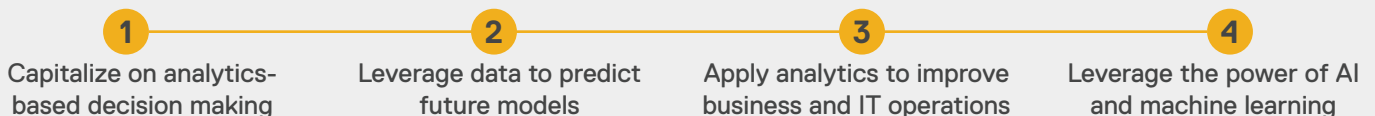
As your company becomes more familiar with using data, IT helps scale its use and amplify the business value of both stored and real-time data.



MILESTONE 4

TRANSFORM

At this point, you're in position to transform your organization and become a true analytics enterprise, one that can use data to predict future models and dramatically advance operations.



Now that you've organized and analyzed your data and

TRANSFORMED

your operations to leverage data analytics, the next step is to move to more advanced analytics uses cases, such as AI and machine learning.



Organizing data means more than just pulling all your information into one place. **Data has to be integrated** into business functions, so it can be acted upon.

MILESTONE 1

ORGANIZE

YOUR MILESTONE BENEFITS

With most or all your data in one central place, business and IT can now turn to a single location for their data needs. This reduces data sprawl, as each project tends to extract its own copy of the data to many different locations. It also creates a single “place of truth,” so all reports start from the same set of data.

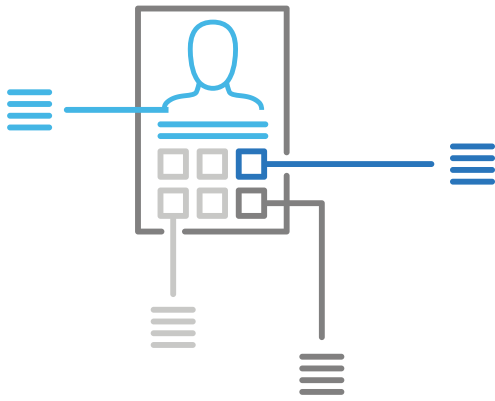
Of course, **the biggest benefit is the speed at which new reports and analytics can now happen** — because you have removed the barriers to accessing data.

STEP

1

Consolidate and move data to a single location for integration

Historically, data has been consolidated in different locations and in different forms. This is generally done in a traditional data warehouse using a scalable relational platform. With this approach, the IT team extracts data from enterprise resource managers, customer relationship managers, and other enterprise applications and places it in a single location.



STEP

2

Define master data to allow ready recall and access

Of course, data is likely to come in different forms, with different terms for the same data elements. That would make retrieval impossible. So, you'll need to define master data that recognizes the business use for it. For instance, different departments may have different ways of identifying and classifying a customer. You'll want to create a single record of that one customer to be able to pull up all the information gathered about that customer across your enterprise.

TECH TALK

WHAT TO SAY

Earlier, you reached agreement with the business side about overall strategy. Now, your communications focus shifts to more tactical steps.

- **Guide the IT team** in implementing the critical first steps.
- Adjust details in consultation with the business side as you progress — for example, **refine master data structure.**
- **Manage expectations** — explain that it's a process and urge patience.

WHAT TO DO

- **Use high-end relational databases**, such as Oracle and SQL Server, but also consider relational MPP databases such as Greenplum because analytical queries, using indexed joins, don't tend to join results sets neatly.
- **Use whatever data migration tool you prefer** — even a custom tool.
- Once data is in the data warehouse, **select presentation tools** such as report writers or visual display tools.
- Focus on **generating standard search results.**

STEP

3

Provide or support business intelligence tools to business units

As the data is gathered, you'll want to allow business units the chance to use the business intelligence tools they've employed in the past. You also may have some other business intelligence tools users are familiar with, or can be taught to use and grow with, and that IT can support.



STEP

4

Set up the governance of the data

For operational efficiency, privacy and security reasons, you'll want to have a system set up to govern the data now stored in one central location. One of the key changes your organization may experience in this technology journey is shifting "ownership" of data from the IT side to the business side. Accordingly, the governance rules should be created by the business units with help from IT. IT's role is to enforce the governance rules and ensure that data is moved around in a way that doesn't break that governance.

Business units create the governance rules



IT enforces the governance rules

New reports and analytics can be available at the speed of business.



Once the Organize milestone has been accomplished, you're ready to move to what we think of as the **Analyze milestone.**

At this juncture, you're empowering the business side to take advantage of what's been laid out for them.

MILESTONE 2

ANALYZE

YOUR MILESTONE BENEFITS

Providing the tools and data platforms that allow business users to easily consume the organized data, IT is now **enabling the business consumers to create their own reports and perform their own analytics.**

This capability allows the individuals with the greatest knowledge of the subject areas to work with the data and it allows unprecedented speed of innovation, as IT is no longer a bottleneck that blocks innovation.

STEP

1

Introduce analytics-as-a-service

To allow business units to access and use the data in a cost-effective, secure manner, you can create an analytics-as-a-service model, where each unit gets a “workplace” within the data lake. Business units can bring in their own data, as well as access what you might call “hub” data — that is, consolidated data from different sources. Of course, data governance structures ensure any necessary constraints on the hub data.

Provide data scientists to seed the analytical functions

While some units will have their own analytical expertise, they likely can benefit from allowing the organization’s data scientists to help them get set up to use the data. The data scientists also can introduce them to new tools that can be effective in attaining the insights the business seeks.

STEP

2

Don’t have a data scientist?

No problem. Identify “citizen data scientists.” This term, popularized by Gartner, refers to people who work outside the fields of statistics and analytics, yet routinely touch and deploy analytics tools that yield insights to keep your business competitive.

TECH TALK

WHAT TO SAY



- **Reinforce the cost advantages and ease of use** that comes from consolidating data.
- **Clarify the shifting role of IT:** You provide platforms and consulting services, but business units now dig in to do the analysis itself.
- Emphasize that the change provides the business teams **greater control and quicker results.**

WHAT TO DO



- **Build the core of the data lake with Hadoop,** but allow the business side to **access information through a relational database,** such as the Greenplum MPP database.
- **Help business people learn** how to use new technologies, if necessary.
- **Re-define job descriptions,** if required, to emphasize IT’s shift from controlling data to managing it.

STEP

3

Provide collaborative analytics tools

Using tools such as Business Objects or Tableau, business users can learn not only how to assemble the analytics they need, but also how to gain business insights and present the information effectively.



Why analyze?

Successful data analysis yields tangible business results — all the way down to the bottom line.



One manufacturer was able to avoid revenue loss of up to **\$15 million**

per year by implementing data analytics and machine learning*



Those who have implemented AI into their organizations increased customer satisfaction by **75%***

*Source: Dell Technologies

STEP

4

Strengthen acceptance and use of the unified analytical platform

It took time, coordination and effort to get to this milestone. You have now built a successful solution, and you may have found a need to rid the organization of shadow IT operations that had been the go-to platform for frustrated business units. Now is a good time to take steps to educate and remind users throughout the organization of opportunities to join the program and to outline the successes you're having as a company by relying on the unified platform.

Invest for the future

To successfully create a robust, functional data analytics environment that serves your organization, you'll have to accept that the payoffs won't happen immediately. In the near-term, your IT budget may go up but so will the business impact. But, in the long run, it will allow your organization to drive greater business efficiencies with a predictable ROI. For example:

Targeted Marketing

By having analytical insights into your marketing activities, you can more efficiently and effectively generate leads and responses, effectively target and segment prospects, and report accurately on what works and what doesn't. That leads to a more cohesive, systemic marketing approach, while allowing fine-tuning based on effectively tracking information as it is received.

Proactive Quality Assurance

By collecting and sharing insights across the enterprise, you can have a more holistic understanding of important issues, as well as a response that is appropriate for the matter at hand. For example, if you're a manufacturer and you've learned that a few of your customers are experiencing failures with one of your products, you can identify other customers who should get service calls before they report the failure. You can zoom in on whether the failed products came from just a small batch of a supply or from a large run.



Once the business has reached this third milestone, **it's time to ramp things up** — building on success and seeing what else is possible.

MILESTONE 3

INNOVATE

YOUR MILESTONE BENEFITS

Data is now easily accessible to business users, and they are beginning to gain insights into the possibilities. In this milestone, the business side — with the support of IT — continues to refine the use of analytics to discover new ways to visualize data and use data-driven insights. With IT focusing on operationalizing those insights, the business is free to **continue innovating, fine tuning the results and moving toward the broad use of analytics** in the enterprise.

STEP

1

Make the applications more flexible and scalable

Business leaders now have expanded insights into what they can do with data. Now is the time to provide the IT development that helps them to make those ideas come to fruition, either by adding new elements, expanding the usage of an application, or both.



STEP

2

Protect mission-critical applications

Each business unit is likely to have at least one app that is mission-critical. IT needs to work with the business units to safeguard those apps and to help ensure they are always available and working optimally.

TECH TALK**WHAT TO SAY**

- **Promote the wins** the business has achieved. Note how those wins were made possible by the consolidated platform and the associated consulting service.
- **Respond to new rounds of requests for help** with other analytical projects from the business side.
- **Capture and share operational insights** that IT has gained from the work to-date.

WHAT TO DO

- To control demands on the IT department's time, **limit the rollout of new tools** the department fully supports.
- Allow business teams to **bring their own tools**.
- Concentrate on **supporting tools that are most requested**.
- **Provide a Hadoop "client"** (virtual machine or Docker container) with the standard Hadoop distribution and user IDs for the consumers. This allows them to install their own tools and connect to the Hadoop distribution.

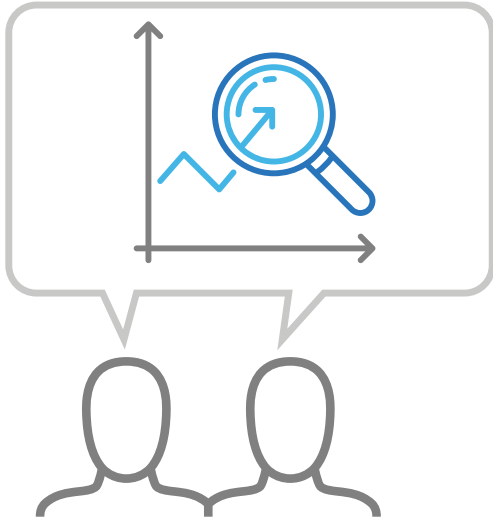
STEP

3

Add real-time capability

Data keeps growing and being added to the enterprise. Now is the time to find ways to look at it upon its arrival and add predictive analysis to the enterprise's skill set. Real time data processing will provide more accurate insights, as well as the ability to take immediate action when needed.





STEP

4

Collaborate on the delivery of data and insights

As business units become more comfortable with the analysis they're doing, they likely will feel confident enough to share the results so other units can benefit. Because everyone has access to the same, pertinent information, there's no second-guessing whether the conclusions are valid for other units. As insights are shared, their value grows — one of the many ways the initial investment represented by the Organize milestone is now paying off.

The business is now free to innovate and find new ways to use data-driven insights.

Watch video



Your organization now enjoys:

Analytics-based decision-making across the enterprise

The **ability to leverage data** to move to more advanced stages of analytics — predictive and prescriptive usage

Streamlined operations, made more effective and better-informed by the collective use of information

MILESTONE 4

TRANSFORM

Having successfully progressed through the first three milestones, you now have a data analytics infrastructure that empowers business transformation. This infrastructure is now part of your organization's DNA. You can expect that data will drive better business decisions — instead of relying on best guesses and industry trends.

TECH TALK

WHAT TO SAY



- Talk with business teams about the results: **Was the outcome what was sought?**
- If so, how can you replicate the process? If not, **what needs to be changed?**
- **Discuss other use cases that have arisen** and should be considered in the future, including those around artificial intelligence.
- **Identify future goals and objectives** that could be met through deploying this type of infrastructure.

WHAT TO DO



- **Continue to introduce new platforms and technologies** to amplify discoveries throughout the organization.
- **Explore the use of technologies that provide data-streaming and real-time analytical functionality,** such as in-memory, NoSQL and NewSQL data platforms.
- **Provide the latest visualization tools** so insights can be more easily gathered and shared with a larger audience.

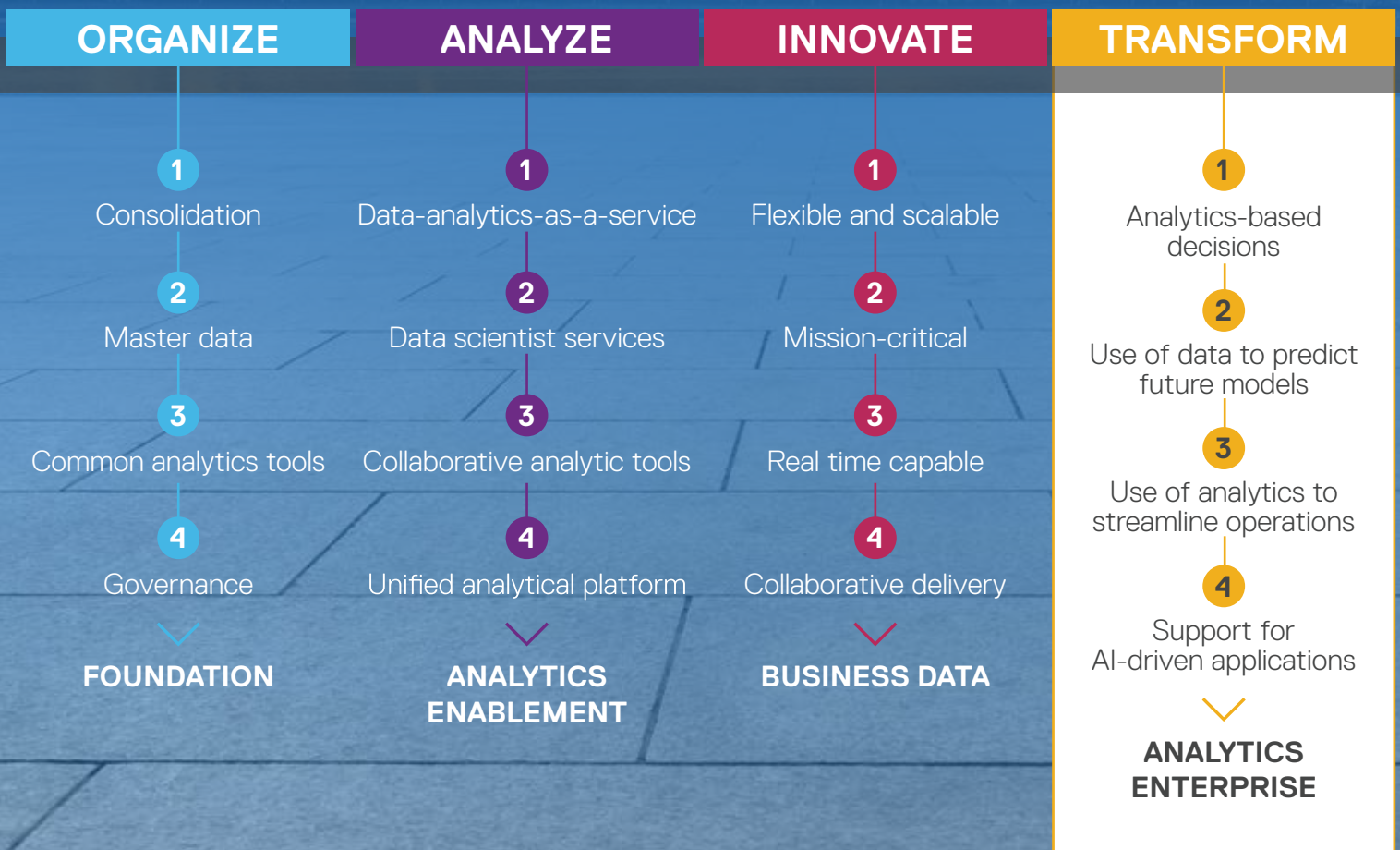


The journey

The speed with which you move through each stage of the journey will depend on your organization. For many organizations, this is a process that may take years but, as highlighted in this document, there are valuable benefits gained at every milestone in the journey.

Dell Technologies shares the timeline it went through below in implementing its data analytics infrastructure. Because we were essentially building the road as we went, our technology journey took more time than it will take for those who follow.

Our expectation is that this guide will not only help you see where you need to go, but will also help you get there more quickly.





Begin your journey

This guide for your **Data Analytics Architecture Journey** is intended to help your organization start thinking about how to take control of the information rushing toward you every day, rather than being overwhelmed by it. To move toward that state, we suggest you take the following actions over the next few months.



Leadership

Determine who should be your primary business and IT leaders, along with any other key participants who could help provide the vision, understanding and insights your organization will need to launch this effort.



Goals and Use Cases

Identify your goals and business use cases. What will you do (or hope to do) with your data? How does your organization generate revenue and what impediments are limiting that ability?



Technology

Assess your technology from a data analytics architecture perspective. If you have already completed the Organize portion of the technology journey, then determine whether you need to add more resources to the Analyze portion, for example.



Budget

Determine a budget for your data analytics architecture journey, with assistance from vendors if needed. One caveat: Be suspicious of any vendor who promises a shortcut to transformation — because shortcuts can lead to project problems and major disappointments.



Research indicates



64%

of companies that have fully embraced AI cite more efficient operations and increased productivity as a benefit.*




Dell Technologies Data Analytics Consulting Services can help you define how analytics can transform your business. This consulting engagement leverages a proven methodology of collaboration between the business and IT to envision, identify, and prioritize data-driven business opportunities as well as provide a roadmap for executing that vision.

Resources




Tools for success

-  **Dell Technologies Data Analytics Consulting Services:** Leverage Dell Technologies Services' proven methodology to collaborate with the business and IT to envision, identify and prioritize data analytics opportunities and your custom roadmap.
-  **Dell Technologies Centers of Excellence:** Work directly with Dell Technologies HPC and AI experts to test and tune solutions prior to purchase in these hubs for innovation and expertise.

Products and solutions

-  **Validated Designs for Analytics:** Unlock the value of your data with optimized solutions designed to help you manage and harness the value of big data analytics.
-  **Validated Designs for AI:** Go from AI-possible to AI-proven. Learn how Dell Technologies offers everything you need to accelerate your AI initiatives.
-  **High Performance Computing Solutions:** Impact the success of your organization with high performance computing solutions that help your organization capitalize on the power of HPC, data analytics and AI.

Customer stories

-  **Ohio Schools:** Providing informed decision-making for safety
-  **Mastercard:** Stopping card fraud in its tracks
-  **TGen:** Giving hope to children with rare cancers

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