

PUTTING ANALYTICS IN THE DRIVING SEAT

Delivering real-time information as a key
component of business decision making.



FIVE STEPS TO THE DATA-DRIVEN BUSINESS

As organizations look towards embedding data-driven insights into the business, they can embrace the fact that the best technology adoption rates come from being business driven – this is true for analytics. In this paper, we look at the steps necessary, based around a think big, start realistic policy.

INTRODUCTION

Rapidly increasing volumes of data in all industries are creating opportunities for innovation. Being able to harness your data and derive insights from it is critical to success in today's data-driven economy.

STEP ONE: UNDERSTAND WHERE YOU ARE ON THE ANALYTICS JOURNEY

Analytics is a journey. As with any journey, it's good to know where you're starting from, so understanding your level of analytics capabilities today is an important first step.

STEP TWO: UNDERSTAND BUSINESS DRIVERS AND TRANSFORMATIVE OUTCOMES

Consider why you need analytics and how you can best use your data to help you support business goals. Research what others are already doing, and speak to your own business units to hear how they would like to innovate and identify where improved insights can help.

STEP THREE: CREATE A DATA-CENTRIC FOUNDATION FOR INNOVATION AND INSIGHT

When you know where you are now and where you want to go, you can begin exploring what tools and resources you already have that can help you get there. Think about how you collect and manage your data now and any changes that need to be made to these processes, and work with your IT team to understand the technology implications of your analytics ambitions.

STEP FOUR: CREATE A POC TO PREPARE FOR THE FUTURE

Run a relatively straightforward, contained, and easy to implement proof of concept to demonstrate and deliver quick measurable value to the business. This also gives you an opportunity to identify and learn from any pitfalls before you launch your analytics initiative on a large scale across the enterprise.

STEP FIVE: BUILD ON SUCCESS AND PROVIDE A DATA-CENTRIC FOUNDATION FOR THE FUTURE

Use your proof of concept and other early initiatives to identify your next areas of focus – whether its new analytics projects, or priorities for investment to enable you to introduce more advanced types of analytics to support more complex use cases.



INTRODUCTION: ANALYTICS IN THE REAL-TIME BUSINESS

We live and work in an increasingly data-driven world. Across industries and around the world, enterprises have an opportunity to work with rapidly increasing volumes of data, coming from a widening pool of sources. In the automotive industry for example, cars and other forms of transportation are creating and receiving data for vehicle tracking, driver feedback and a range of new

services; in healthcare, hospital infrastructure is orienting towards providing information to patients and medical professionals, at the point of need.

Such developments are not going to stop transforming the business landscape. Most organizations we speak to recognize the critical role analytics technologies play, enabling faster, deeper data insights,

driving business value and creating competitive advantage through business model innovation and new customer experiences. For traditional enterprises, analytics also offers a way to respond to the competition from new, digital-first organizations.

As organizations look to harness data-fueled insights and power business agility and innovation, data volumes continue to grow exponentially. Already, organizations wanting to extract faster value and deeper insights from real-time data are looking beyond traditional data analytics to more ambitious initiatives such as machine learning. For example, analyst firm IDC forecasts that by 2020, 40 percent of enterprises' net-new investments in analytics will be in predictive and prescriptive analytics¹. Such aspirations do not always meet with success, however, as existing practices and infrastructure are not built for these kinds of use cases.

Enterprises know that time is of the essence: businesses slow to tap value from data risk being at a significant competitive disadvantage. As they find themselves lagging on the analytics journey (for example, with business practices still dependent on weekly reports rather than real-time feeds), they may try to jump straight to more advanced practices without having the necessary fundamentals in place.

So, if you can't run with analytics before you can walk, but you are looking to drive your organization forward in its use of data, how should you progress? Based on our experience helping clients on their analytics journeys, this paper looks to cut through the complexity, setting out a series of steps to help senior business decision makers transition their enterprises to a data-driven organization:

- **Step one:** Understand where you are on the analytics journey
- **Step two:** Understand business drivers and transformative outcomes
- **Step three:** Create a data-centric foundation architecture
- **Step four:** Create a PoC to prepare for the future
- **Step five:** Build on success and provide a data-centric foundation for the future

As we work through these steps, we learn the importance of putting the business needs first, as lines of business, and the whole enterprise, understand how they can benefit from becoming more data-driven. The goal is not to achieve an overnight transformation, but to accelerate progress and generate early business value, as the business and IT work collaboratively towards business transformation.

¹ IDC FutureScape: Analytics, Cognitive/AI, and Big Data Predictions, December 2016.

STEP ONE: UNDERSTAND WHERE YOU ARE ON THE ANALYTICS JOURNEY

Whatever your organization is looking to achieve from analytics, its ability to be data-driven depends largely on where it currently is on its

analytics journey. In our [analytics planning guide](#) we map out five stages of analytics, from descriptive to cognitive (see figure 1). From a

business perspective and working with customers across sectors, we have learned that organizations tend to see themselves occupying one of five categories.

Most organizations we speak to hover somewhere between the first two types of reporting, with pockets of higher-level competence in certain lines of business. While consulting firms offer services to derive a comprehensive view of your position on the analytics journey, you can start to gauge your organization by asking straightforward questions such as:

- Do your IT systems or software provide the data necessary for day-to-day business operations?
- Does the business have an inventory of, or otherwise understand, what data is available?
- Is it clear what gaps exist in the data, and how they might be filled, for example using which sources?
- Do lines of business gain immediate access to data or do they have to wait days, or weeks for reports?
- Can managers and staff access information straightforwardly, or is it difficult to access?

If any of these questions are given a low mark, then building a more advanced set of analytics capabilities will be challenging. As a result, a big part of what we do with our enterprise customers is understanding where they are, then giving them the knowledge they need to advance. We do not necessarily advocate working through every stage one by one; however, competences learned at earlier stages are an essential foundation for higher-level competence.

For example, you cannot go straight to AI if you don't understand your data – there is no magic tool which can crunch all the data you have available and understand your business priorities, opportunities or risks. It is important for any

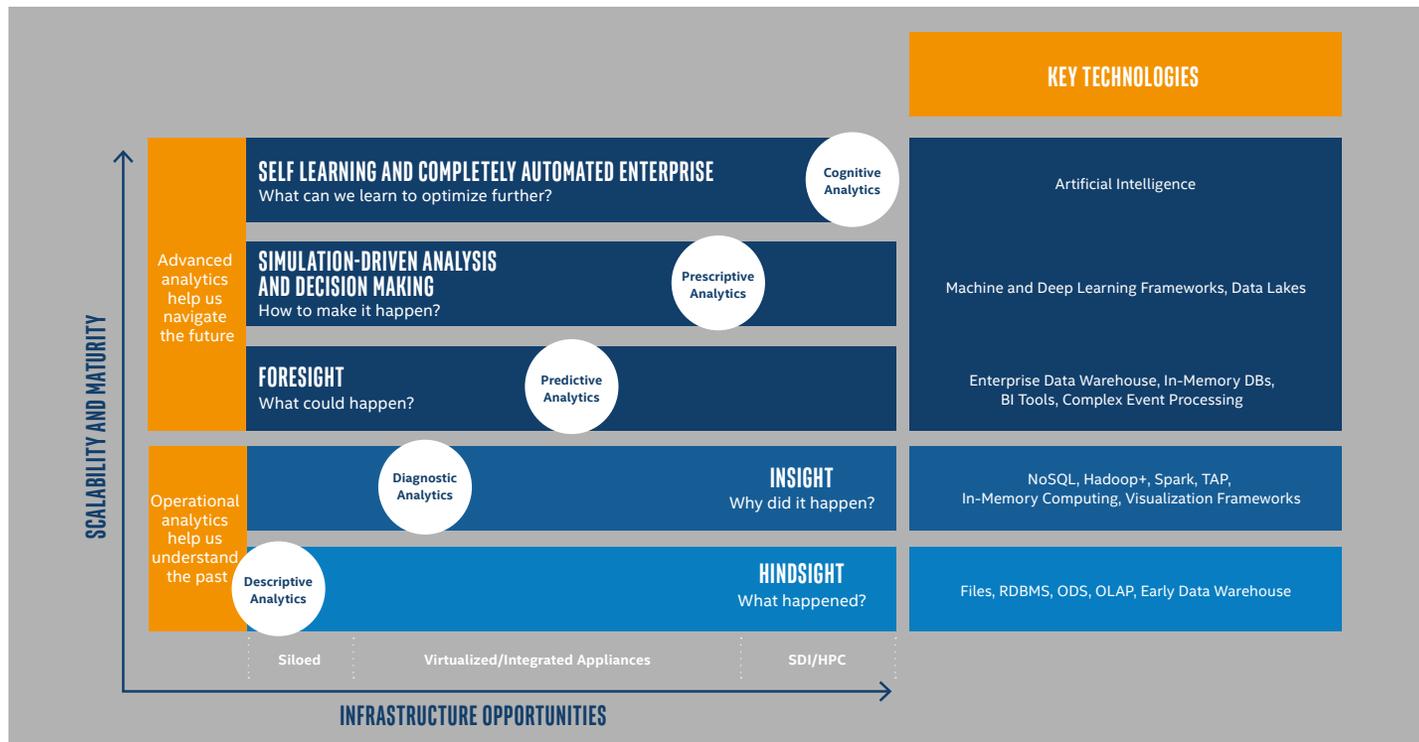


Figure 1: The stages of analytics maturity



organization to have the right data available for business-as-usual, before it looks to tackle the more advanced opportunities analytics can bring.

For business decision makers and executive sponsors, this understanding helps frame discussions with IT executives creating business cases for

analytics: future investments can be compromised if the basics are not in place. Armed with this understanding, your organization can decide what it wants to get out of the wealth of data it has at its fingertips.

STEP ONE: TAKEAWAYS AND OUTCOMES

- Ask questions to understand your organization's current level of analytics maturity
- Work with your IT team to determine what data is available to you for analytics

DEEP DIVE: ARTIFICIAL INTELLIGENCE (AI) AND DEEP LEARNING

While Artificial Intelligence (AI) concepts and algorithms have existed for decades, it is only in recent years that advances in processor technologies and the resulting economies of scale have brought AI out of high-performance computing environments and into the enterprise. AI algorithms apply mathematical models and rules, coded expertise and machine learning to massive structured and unstructured data sets, enabling access to insights that were previously out of reach.

Of particular interest is deep learning, which has evolved from machine learning, and the use of neural networks to develop insights from data without needing to 'know the rules' in advance. Deep learning is enabling breakthroughs in areas such as speech and image recognition, as well as enabling data scientists to drill deeper into existing data sets, uncovering new insights across industries and creating a platform for a smarter future.



STEP TWO:

UNDERSTAND BUSINESS DRIVERS AND TRANSFORMATIVE OUTCOMES

Even as enterprises grapple with these topics, few have the luxury of standing still in the face of digital trends such as cloud, social, mobile and IoT. Such trends make it even more critical to grow an organization's ability to rapidly harness insights from data – indeed, this is a fundamental element of digital transformation. The specifics of your analytics strategy and your overall digital strategy will therefore go hand in hand.

While understanding how analytics can drive your business may appear daunting, the good news is that

many examples are now available of how organizations are driving new business. You can learn from success stories – for example, from analyst reports or consulting firms – in your own industry and across others, to see what opportunities exist for your own organization and how to go about achieving them.

Many reports show how analytics is, or has already moved from a passive reporting tool towards driving new business models and empowering staff. In healthcare, [Penn Medicine](#) has been looking at reducing patient re-

admission by ensuring that potential causes of return hospital trips are mitigated in advance; meanwhile another organization has been employing deep learning and AI to improve diagnosis and treatment outcomes. Startup and web-scale businesses are also a good reference for business model innovation, particularly as they see data as a resource to drive rapid innovation, rather than as a rear-view mirror.

Armed with this understanding about what possibilities exist for your own business, you can set goals for how you plan to use data. This decision is fundamentally a business strategy: you can choose to take a disruptive position, looking to completely new business models, or to adopt a similar strategy to your peers or more disruptive competitors. Some lines of business may already have a good grasp of where data-driven approaches would deliver business value. Whatever you choose to prioritize, you need to grow your big data competence, considering approaches which put data front and center of business practice.

This should be done in collaboration with your IT team, for example by running a workshop.

You will now be in a stronger position to map out what the business is trying to achieve (based on where it is currently), what problems and challenges you are looking to solve and how data can help. You will also be able to confirm your organization's appetite for data centricity. You do not need to boil the ocean to identify clear transformation opportunities that will benefit your business. With these understood, you can define an architecture to deliver on them.

STEP TWO: TAKEAWAYS AND OUTCOMES

- Research how other companies are using analytics for ideas on possible use cases
- Consider how you can best use your data to support business strategy

STEP THREE: CREATE A DATA-CENTRIC FOUNDATION FOR INNOVATION AND INSIGHT

```
elif operation == "MIRROR_Y":
    mirror_mod.use_x = False
    mirror_mod.use_y = True
    mirror_mod.use_z = False
elif operation == "MIRROR_Z":
    mirror_mod.use_x = False
    mirror_mod.use_y = False
    mirror_mod.use_z = True

#selection at the end -add back the deselected mirror
mirror_ob.select= 1
modifier_ob.select=1
bpy.context.scene.objects.active = modifier_ob
print("Selected" + str(modifier_ob)) # modifier ob is th
#mirror_ob.select = 0
None = bpy.context.selected_objects[0]
bpy.data.objects[me.name].select = 1
```

Having confirmed where you are on your journey and your organization's strategy for analytics, you can look at how you are going to deliver on it. This means looking at your existing technology and data management platform and identifying how and where you can build on the investments you have already made.

While business transformation is always a challenge, organizations can adopt data-driven approaches that deliver value from day one, ensuring that benefits always outweigh the costs. Using the outputs from the first two steps to set scope, you can first undertake a gap analysis exercise by looking at:

- What data you already have as internal resources
- What data you are collecting from external sources
- How you work, including with third parties, to collect data

- How data is shared across your organization
- How data is kept secure and compliant to governance requirements
- What data you provide to other parties

You may find that some lines of business are more data centric than others, so you can learn from them what approaches are most successful for your enterprise to adopt more analytical practices across the business. You may also uncover opportunities to improve processes and efficiencies. For example, organizations may have had a data retention policy in place to meet regulations, but have moved towards keeping everything as they don't know what is useful.

The answers to these questions will enable you to determine how data will be collated, analyzed, and used across the organization. You will

be able to prioritize certain parts according to business value, and the need for further aligning the business with IT. For example, you may identify low-hanging fruit which need very little investment to fulfil; you may also identify areas that need more significant investment and therefore require a more thorough business case.

Various analytics platforms are available today to help enterprises get beyond “rear view mirror” analytics and traditional BI to more predictive capabilities and real-time insights powered by big data analytics and machine learning. However, it is not necessarily about one solution over the other, but more about having the right tool box and knowing which to use in which scenario. Your IT team can help you identify and evaluate technologies for memory, compute power, and data management that will meet your needs.

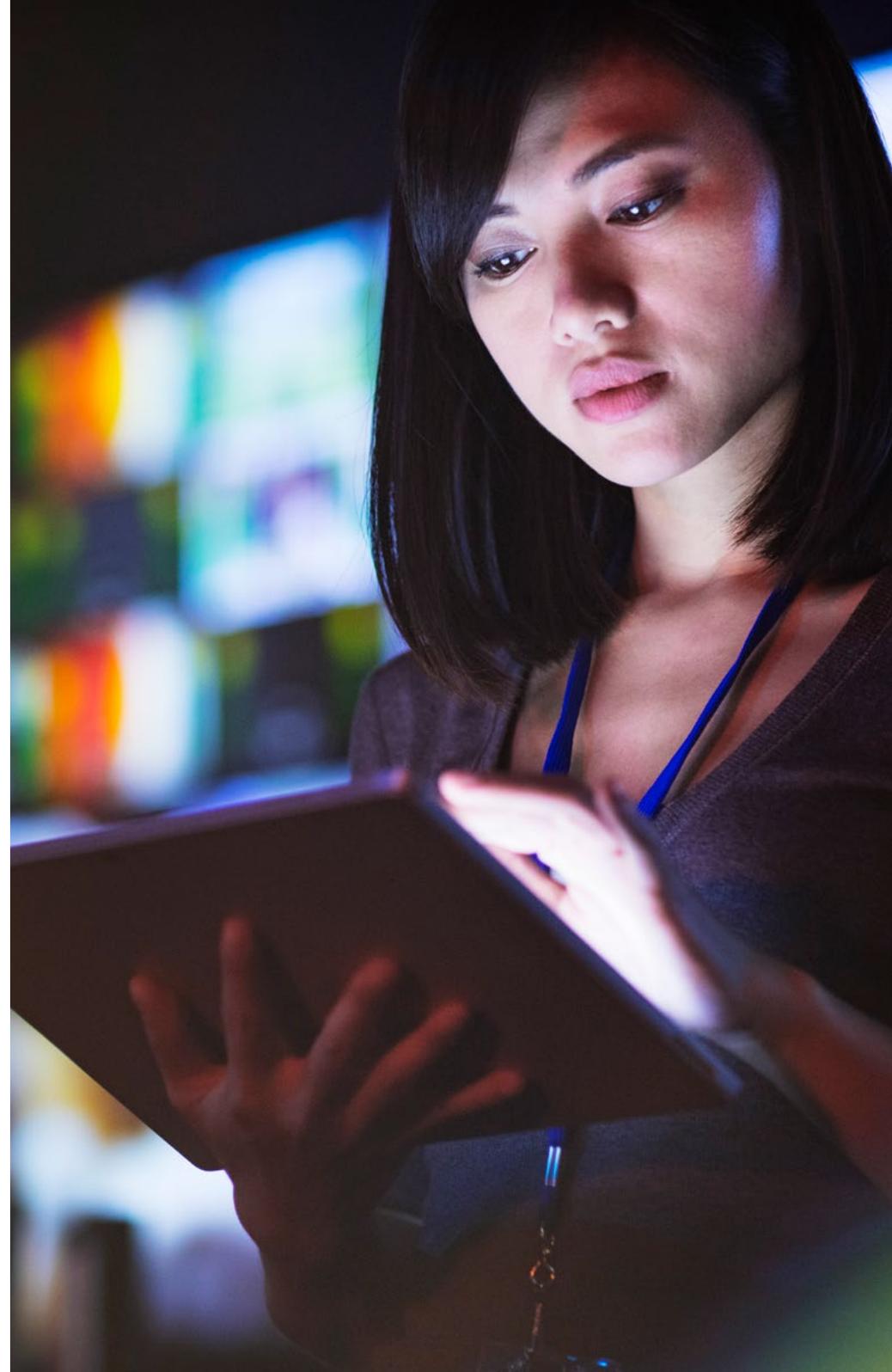
During this step, you should end up with a realistic view of what you are looking to achieve, and what you already have in place. It is very important to be honest about your strategy and ability to deliver on it. For example, you will be able to determine whether lines of business have the support of the IT organization, or whether they are battling against it: if the latter, you may look to bring in a partner to help move things forward.

As this step comes to an end, you should make sure that the enterprise team and the IT organization are in lock step, focusing on how to deliver data-centric approaches into lines of business. For organizations at an earlier stage on the journey, it is of significant benefit to identify a senior executive sponsor who is bought in to thinking beyond monthly reporting cycles and towards real-time data delivery.

STEP THREE: TAKEAWAYS AND OUTCOMES

- Seek to match up possible use cases with existing capabilities to deliver quick results and secure buy-in
- Work with your IT team to create a realistic roadmap for future projects and the IT investment they will need
- Ensure close collaboration between business and IT throughout, led from the top

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STEP FOUR: CREATE A POC TO PREPARE FOR THE FUTURE

Perhaps the most important step on the journey to analytics is the creation of a proof-of-concept (PoC) exercise. In this step, you will test how accurately you understood your business's data needs and your ability to deliver on them. It is also deliberately designed to keep you from jumping in too quickly and attempting to achieve too much before you have the skills and experience you need for success.

As a result, it is key to do some quick PoC work to show the art of the possible, defined in the context of the data-centric foundation drawn up

in the previous step. When selecting your PoC, you should consider the following questions:

- Are the project goals presented in terms the line of business would understand?
- Does this project align with strategic business goals?
- Can I get management support for the project?
- Does the PoC hold a unique promise for insight over more traditional analytics?
- What actions can I take based on the results of my project?
- What is the potential return on investment to my business?
- Can I deliver this project with a time to value that is measurable in months, rather than years?
- Is the data that I need available? What do I own? What do I need to buy?
- Is the data collected in real time, or is it historical data?

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While you may aspire to achieve great things with data, you should nonetheless manage expectations with the first PoC. The initial opportunity is less about trying to do something new with a new technology platform, and more about trying to do better things with what you've got, filling gaps with new technology and services where necessary. This "thinking big, starting small" approach enables you to:

-  Deliver business value early, growing confidence in data-centric approaches
-  Develop skills and experience both in technical and business terms
-  Enable the business and IT to co-ordinate, build relationships and mutual trust
-  Grow understanding of the organizational culture required
-  Advance overall analytics culture and competency, catalyzing business transformation

From a business perspective, you can look to ensure that the technology meets your business objectives and delivers the necessary value. Meanwhile, your IT decision makers can consider the following criteria as they select an appropriate technology platform for your data analytics initiative:

-  Performance – provide data and insight to the (business) point of need when, or indeed before, it is needed
-  Flexibility – make the solution adaptable to changing circumstances, for example, should the data needs change
-  Scale – ensure the solution will continue to function if volumes of data or user numbers grow over time or in bursts
-  Compatibility – be open to integration with third-party data sources and services, using standard protocols



In addition, given how a sub-optimal PoC will undermine business trust and waste money, it should be supported from the top level and given as much freedom as possible to succeed. You may hit roadblocks along the way. Even with the best

intentions, you may experience failure the first time around, which you should see as an opportunity to learn. Ultimately, you should be able to see how analytics can benefit your organization and drive it forward.

STEP FOUR: TAKEAWAYS AND OUTCOMES

- Start small and manageable with a well-supported pilot project that delivers value quickly
- Be clear on your objectives and make sure they are business-focused from the outset



STEP FIVE: **BUILD ON SUCCESS AND PROVIDE A DATA- CENTRIC FOUNDATION FOR THE FUTURE**

Once you have achieved a successful PoC and have learned any lessons along the way, you can move to developing and building out your analytics capabilities. Based on your experience, you can revise both your architecture and your plan, aiming to deliver value at each stage, both in terms of business benefits and moving you along on the journey towards advanced analytics. You can run workshops and other collaborative activities internally and with external partners to gain expertise and start innovating. Whatever you do, keep focus on the fact that the overall goal is to make analytics part of 'business as usual'.

Some opportunities may drop out naturally from your PoC or other initiatives. For example, if you have incorporated sensors in a production line to alert in case of a fault, you could derive extra value from the investment by using the sensor data to help you predict, and therefore pre-empt, equipment failure. Leading industry brands have built upon their analytics initiatives to help drive customer loyalty and brand affinity, and grow business revenue.

At this stage, you may decide that you need a fully-fledged infrastructure built from the ground up to support your analytics needs.

You can then start building even higher order analytics capabilities. For enterprises that are farther along their analytics initiatives, machine learning and other artificial intelligence (AI) techniques represent the next frontier, helping address some of today's most complex data challenges.

We have enterprise-scale solutions at Intel, and can give you advice about building, scaling and future proofing an analytics infrastructure, including what solutions to use, and based on your planned business priorities and roadmap (see figure 2).

You will also be able to identify what new roles you need in your organization, at the executive

level. Implementing advanced analytics in your business means your data now takes a prominent place at the highest levels, and it needs proper representation. Newer roles include:

- Chief data scientist, who can apply algorithmic experience to help determine new business models
- Chief analytics officers, who take an operational view over how well an organization is using analytics
- Citizen data scientists, members of the broader workforce who are empowered to use analytics tools

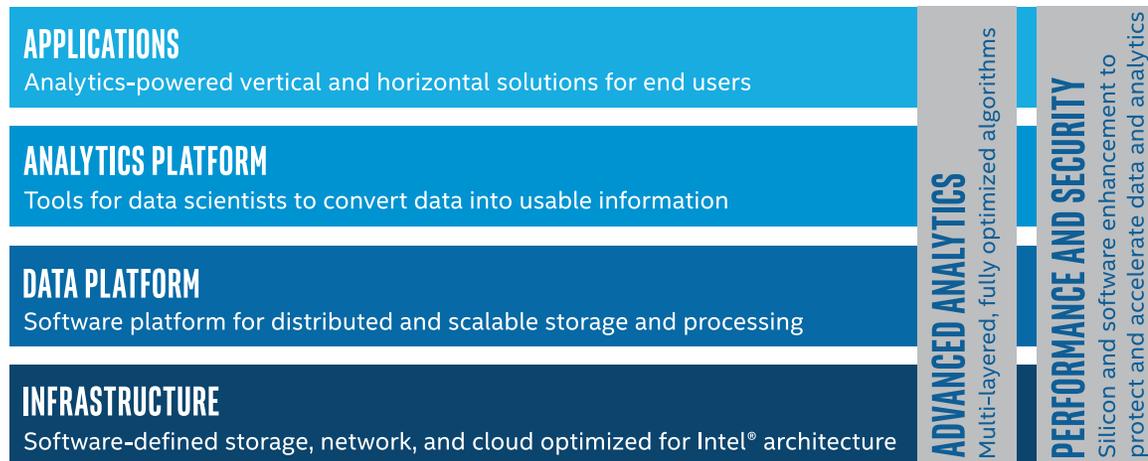


Figure 2: Your analytics infrastructure must be based on planned business priorities and roadmap. Intel's enterprise-scale technologies can help.

STEP FIVE: TAKEAWAYS AND OUTCOMES

- Refine your long-term plan in line with learnings from your initial projects
- Consider further investment in analytics-enabling technologies where appropriate
- Ensure you have appropriate representation at the executive level



CONCLUSION

Of course, the journey to advanced analytics is going to be an evolution, not an overnight change. However the data deluge won't slow down, so neither should your business slow its transformation into an insights-driven organization. All parts of the business

can benefit from direct access to real-time insights generated through advanced analytics. By making your organization think in terms of data centricity, you are empowering staff and creating a foundation for future innovation and business success.

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- **Analytics planning guide:** [Getting Started with Advanced Analytics](#)
- **Web article:** [Building a Data-Driven Business](#)
- **Web article:** [Sharing IT Best Practices](#)
- **eGuide:** [Advance with Analytics](#)
- **Whitepaper:** [Five Steps to Delivering the Data-Driven Business](#)

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