# Reimagining Healthcare and Life Sciences:

## 5 Ways to Accelerate AI and Analytics

Data Strategies to Improve the Health of Populations, Deliver Exceptional Consumer Experiences, and Reduce Costs

# Attitudes Toward AI and Analytics are Changing

Today's healthcare and life sciences industry is turning to artificial intelligence (AI) and advanced analytics as the engine driving innovation and value. Attitudes that AI and analytics are bleeding-edge technologies for the future are vanishing — as are the beliefs that security and privacy concerns are roadblocks to the successful deployment of AI.

Although still in early days, AI proof of concepts (POCs) and pilots are now commonplace with a fair number of these initiatives making it to production use. We're seeing AI and data analytics applied to a wide swath of real-world healthcare and life sciences initiatives, with encouraging results.

Still, we're also seeing many organizations stumble along the way. Specifically, businesses are making some common errors when starting on their AI and analytics journeys. Happily, these can be corrected with an advanced data and analytics management platform and the help of a partner who can provide both the technical expertise to manage enterprise data as an asset along with the deep business transformation acumen needed to achieve value from AI initiatives. In this paper, we highlight top priorities for AI and analytics initiatives in healthcare and life sciences and offer five proven strategies to make them successful.

**Richard Cramer**
Chief Strategist
Healthcare and Life Sciences
*Informatica*

**Kevin Abraham**
Senior Manager
Analytics & Cognitive
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"We often see clients focusing on getting the technology right. Yes, that is an important piece of the puzzle, but without a holistic approach incorporating business strategy, talent, operations, security, cloud, and self-funding techniques, the picture isn't complete, and the value of AI / analytics isn't unlocked or fully realized."

— GEOFF LOUGHEED, PRINCIPAL, DATA PLATFORM ARCHITECTURE & ENABLEMENT LEAD, DELOITTE CONSULTING LLP

# Innovation and Breakthrough in Healthcare and Lifesciences Powered by AI and Analytics

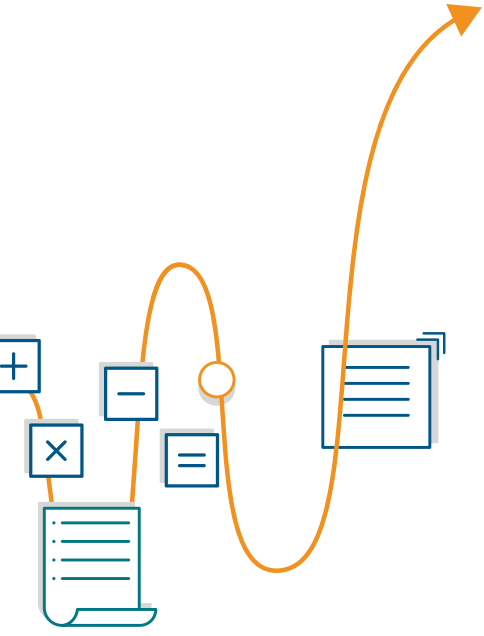
AI and Analytics can be applied to the biggest priorities of healthcare and life science organizations today, including improving population health, enhancing quality of care, and reducing costs, among others. Let's walk through some use cases which are often top of mind for leaders in the marketplace to remind ourselves of the potential that is available to be harnessed through AI and analytics.

### Improving Population Health

While traditional healthcare data from electronic health records is useful, as are medical claims available in large volumes, it is the ability to incorporate the wide variety of social determinants of health (SDOH) data that is transforming healthcare analytics. SDOH include the social, economic, environmental, cultural, and physical factors that individuals within a group are born into, grow up into, and interact with throughout their lives.

"When COVID-19 first hit, we didn't have the data-driven capabilities we have today with Informatica. We hope there are no more pandemics in our future, but should such a situation occur, we are now much better positioned to do that type of data work and report numbers to agencies faster to support population health control."

— ALEXANDER IZAGUIRRE PHD, CHIEF DATA OFFICER, NYC HEALTH AND HOSPITALS



AI and analytics are of critical importance to tracking and improving population health. Nearly four in 10 healthcare and life sciences firms (37%) are advanced in their use of analytics to help in this area, with slightly more just starting their journeys (38%).[1]

## Enhance Quality of Care

AI-driven analytics and automation with machine learning AI and analytics show great promise here to surmount global health challenges. A key objective of healthcare providers and life sciences firms is to identify high-risk patients sooner and with greater precision so they can apply the right intervention, to the right individual, achieving the greatest potential health outcome.

One study was set up to see if deep learning (a subset of AI) could identify high-risk heart failure patients for hospitalizations, worsening heart-failure events, and 30-day and 90-day readmissions.[2] It was shown to be a useful tool to predict heart failure–related outcomes. Done right, AI and predictable analytics will allow clinics to target treatment towards the highest-risk individuals like these. Not incidentally, AI can also be used to identify ineffective therapies earlier in the development process, saving time and money.

## Reduce Costs

Rising costs are a major issue in healthcare, with the impacts affecting not only consumers and those paying for healthcare services, but also the providers delivering care and life sciences and medical device companies. AI and analytics can help with this, too. A recent survey found the chief financial concerns were the cost of personnel and supplies (87%) and operating costs (53%).[3]

According to the Willis Towers Watson 2022 Global Medical Trends Survey,[4] the aftereffects of the pandemic — especially supply chain problems — are expected

to drive up spending in 2022. Health systems are therefore investing in AI and analytics for better forecasting of essential supplies.

And a new analysis by Stanford researchers used AI and analytics to model ways to streamline the out-of-control administrative costs in U.S. healthcare. By using AI modeling to standardize contracts and terms of inter-party agreements and other reforms, the United States could cut billing and insurance-related costs by 27%.[5] The study built on earlier research that documented that it costs a primary care physician $20.49 to submit each patient bill.[6] This added up to nearly $100,000 annually per physician for billing and insurance-related costs.

Through AI and analytics, processes can be made much more efficient, allowing therapeutics to be developed faster and at lower cost, and greater transparency in the supply chain enables shorter manufacturing times and lower supplier costs.

## Accelerate Adoption of Value-based Payment Models

Today's healthcare leaders acknowledge the weaknesses of existing healthcare systems.[7] Many advocate for value-based healthcare: By creating payment models that pay for results – and pay more for better results – value-based care incentivizes healthcare providers to focus on quality of care and outcomes rather than quantity of services.

Value-based healthcare reimbursement models rely on data to provide the key insights required for the value-based approach to succeed: (1) We need data to drive the insights needed to measure healthcare outcomes; and (2) We need to understand the true costs of care and find the inflection point where we deliver the greatest quality for the investment. AI and analytics can help tackle these issues head on.

Under this new reimbursement model, clinical and business processes must be reevaluated and reengineered to focus on quality outcomes, efficiency and cost-effectiveness. This reengineering is an analytics- and data-intensive endeavor. Organizations must use analytics to identify what delivers the highest quality outcome at the lowest cost, and apply AI and ML to determine next-best-actions at the point of care to change behavior.

## Making Better Use of Real-World Data and Real-World Evidence

Each of us, through interactions with the health system or just going about our daily lives, generates an enormous "digital exhaust" of data that is relevant to healthcare and life sciences analytics. Electronic health record applications, consumer health apps, mobile devices, wearables, and other biosensors are gathering huge amounts of health-related real-world data. Real-world evidence is derived from analyzing real-world data to examine the use and potential benefits or risks of a medical intervention or product.

Unlike the tightly controlled data created and curated in support of clinical trials — which by design is very focused on answering specific questions — this real-world

"To successfully transition to value-based care and improve population health while supporting our growth strategy as a business, we needed to get more value out of our data, and do it faster. The need to combine different sources of data and make data available for analytics in near real time is vital."

— MICHAEL BEIENE, DIRECTOR, DATA ANALYTICS, INTERMOUNTAIN HEALTHCARE

data and real-world evidence open up exciting potential to influence the design of more structured clinical trials or support observational studies. They can even answer specific questions once thought to be too costly, too complicated, or otherwise impractical to explore. And with today's AI and advanced analytical capabilities, we are better situated to get valuable insight from this data to accelerate the development and approval of medical products. As a result, real-world data and real-world evidence are playing an increasing role in healthcare decisions.[8]

### Optimizing Healthcare Operations

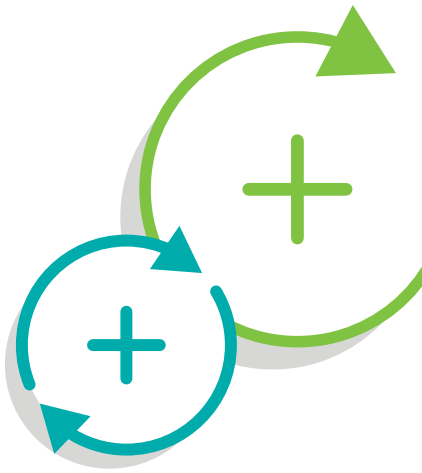
And don't forget the non-clinical opportunities for AI. There are many examples that show how AI has transformed hospitals or health systems in patient care, medical imaging and diagnostics, research and development, and healthcare management.[9] But there are also uses for AI in human resources, talent management, revenue cycle — where AI can deliver tangible benefits swiftly — that might be worth looking into.

AI and automated analytics solutions can help human workers quickly and accurately make sense of these ever-increasing volumes of real-world data. Automation accelerates processing speeds. By providing rapid, reliable results, the technology allows human workers to take decisive action in less time. It also helps avoid "analysis paralysis," which can hold people back when they feel that the data lack the quality needed to drive insights. Automation can help drive confidence and quality in data so decisions can be made even in the presence of incomplete or imperfect data.

### Get More Value from Life Sciences R&D

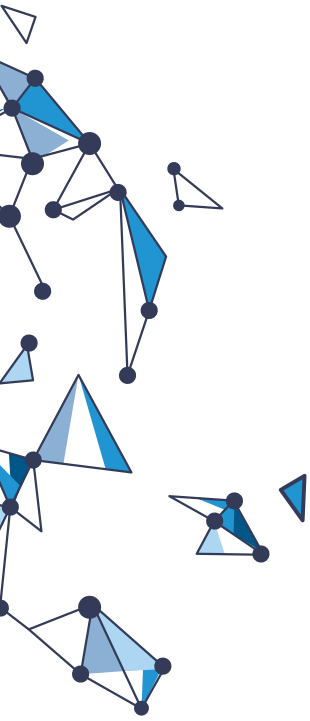
AI algorithms are capable of tracking and analyzing adverse events in clinical trials, accelerating the development of new drugs to help patients in a more-timely manner. Indeed, research shows that AI is useful throughout the drug development lifecycle.[11] When designing pharmaceuticals, AI can predict drug-protein interactions and model the 3D structure of a target protein. During drug screening, AI can also predict bioactivity and toxicity.

Drug discovery has traditionally been a slow process. Data is required to pioneer new medicines for diseases that threaten humanity worldwide. Today, AI and analytics are greatly shortening the time that life-saving pharmacological research used to take — from years to weeks in some cases — and AI is playing a key role in ensuring that trustworthy, relevant, and timely drug-discovery data can be used to understand and eradicate global disease threats.



The 21st Century Cures Act, passed in 2016, allows the use of real-world data and real-world evidence to support regulatory decision making, including approving new indications for drugs previously approved for other uses.[10]

# What is Stopping Many Organizations from Realizing this Value?



All organizations recognize data as one of their most valuable assets to meet their strategic objectives which are often centered around improving the health outcomes and overall well-being for their patients. This recognition has led to decades long investments in traditional on-premises data warehousing solutions, and appliance-based solutions such as Netezza or Terradata. Due to the gradual evolution of these solutions and technical debt accrued over time, they now hamper an organization's ability to scale and respond to the rapidly evolving business needs. This complex and delicate web of data flows which are so essential to the current day-to-day operations sometimes prevent organizations from wholeheartedly committing to a transformation that modernizes their data platform using the power of the cloud. Instead, they are just dipping their toes, working on edge use cases, with partial adoption that leaves them in no man's land. Misnomers about storing PII or PHI on the cloud do not do this scenario any favors either.

The necessity for governed, protected, and trusted data is universally accepted. Yet, we've seen many organizations struggle to successfully adopt these capabilities. Too often data is siloed, with little or no integration between departments, preventing teams from realizing new insights and valuable efficiencies, resulting in duplication of effort and increased costs.

Data silos also inhibit progress on research that can generate valuable insights. When researchers feed low-quality data into AI models, or data that isn't complete, outcomes can be unreliable. Perhaps more troubling is the presence of unknown bias in the data sets used to train AI algorithms, which can have broad adverse consequences. What's more, ineffective data integration and data management prevents many organizations from taking full advantage of AI and analytics.

On the other hand, you have IT organizations who go full throttle on the latest and most innovative technologies, building what they believe is the best-in-class data platform which will undoubtedly serve as a foundation for solving the organization's biggest and most complex problems. This well intentioned and often complex effort fails to gain traction due to lack of business sponsors, a robust business case, or a failure to account for key enabling factors such as talent.

So where to start? How to address these challenges? Let's delve into five actions you can take today to have your AI and analytics journey stay clear of these muddy waters and have it well on its way toward unlocking its full potential for your organization.

"Transparency is the key to analytics being trustworthy. I can disagree with your conclusions and still trust you if I can clearly see where data came from, what has been done with it and what assumptions were made as part of the analysis. This level of transparency can only be achieved with a tightly integrated platform that's designed to work in seamless harmony."

— RICHARD CRAMER, CHIEF STRATEGIST,
HEALTHCARE AND LIFE SCIENCES, INFORMATICA

# Five Actions to Accelerate Your AI and Analytics Journey


## Embrace the Cloud

There's still some apprehension among healthcare clients about transferring their entire data operations to the cloud, especially personally identifiable information (PII) and protected health information (PHI) data. But most healthcare providers today are embracing the cloud. The global market for cloud in the healthcare sector, which was $26.8 billion in the year 2020, is expected to reach $76.8 billion by 2026, growing at a very aggressive compound annual growth rate (CAGR) of 18.7%.[12]

It's less of a technology challenge today to move to the cloud. It can be done, and it has been done. We strongly believe that it's time for all healthcare industry participants to jump in with both feet.

We'd particularly like to stress that there's more trust in the cloud — including much less apprehension about cloud security. It's well-earned. Microsoft, Amazon, and Google have all spent billions on securing their cloud platforms. Microsoft, for example, has more than 3,500 security engineers on staff who are constantly fine-tuning based on what they learn from the more than 1.5 million attempted cyberattacks on its infrastructure every day.[13] It invests more than $1 billion annually in security. Google in 2021 said it would invest more than $10 billion over five years to strengthen cybersecurity.[14]

The Google Cloud Healthcare API allows for standardized data exchange between healthcare applications and solutions built on Google Cloud.[15] Microsoft has a data model purely focused on healthcare for Azure Synapse Analytics.[16] Amazon's HealthLake allows healthcare organizations to securely store, transform, query, and analyze health data, whether structured or unstructured.[17] They also have healthcare-specific offerings that allow healthcare organizations to access complete machine learning libraries without having to write them from scratch.

However, we want to caution that although the security offered by the hyperscalers is impressive and necessary, no amount of investment from these cloud firms can make up for lack of proper security controls implemented by your company. You must take advantage of the security features of the cloud but institute your own layers of security to ensure your organization's data remains safe.

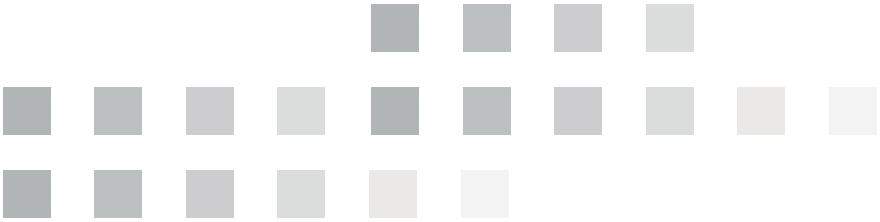
Would you like to accelerate the migration of your data and analytics platform to the cloud? Read "Your path to data modernization" to learn how to enable automation-led migrations with Deloitte, Informatica, and Snowflake

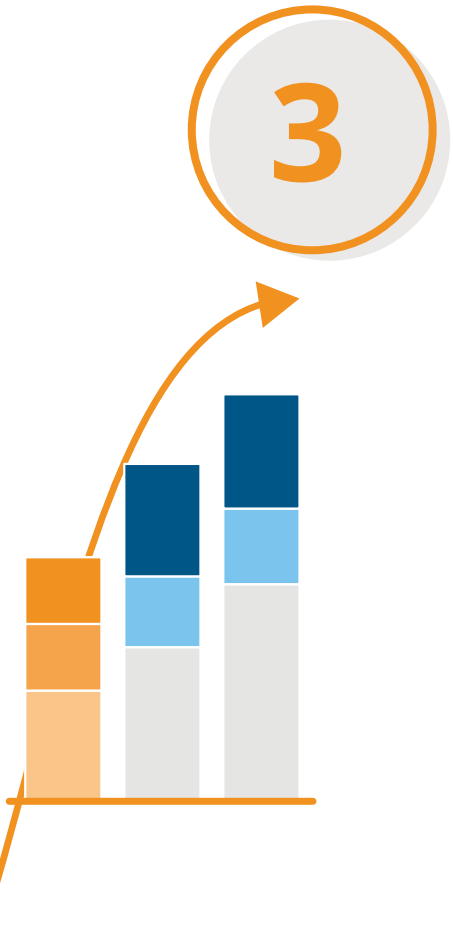
## Don't Shy Away from Multi-cloud

Every organization is multi-cloud, whether they know it or not. At this point, 92% of all enterprises are multi-cloud.[18]

So, plan for it. This is also, incidentally, why enterprises often prefer the flexibility provided by an agnostic data management platform that isn't tied to the infrastructure of any particular cloud. But to effectively use multi-cloud, we note that it's critical to balance ingress and egress costs. For example, it's best not to separate AI workloads from where the data is. No one wants to be constantly shipping data across the wire.

Although it can make sense to have some apps run on specific clouds to take advantage of certain algorithms, healthcare organizations don't want to be pumping data continuously from one hyperscaler like AWS, Azure, or Google Cloud to another. Because when you try to scale, the costs add up, as any of these hyperscalers are going to charge — a lot — every time you take data out. And then there are latency issues. So, we advise you to be prepared for the challenges as well as the benefits of multi-cloud.




## Deliberately Focus on Hardening AI for Production and Scale

AI proof of concepts (POCs) are frequently accomplished by a lone data scientist pulling data from multiple disparate sources, building rules using their choice of tooling and programming languages, and successfully running the models that result. But although that might work, incorporating a model into business workflows or into a daily report sent to senior executives often turns out to be untenable. ETL or ELT jobs would have to be scheduled, data would have to be pulled on a repeatable basis, and data quality rules and governance would have to be enforced. That "productionizing" of the AI model is where things can often fail.

If you try to get to value fast without taking a unified, platform approach, you end up with a single data scientist, slinging custom code in their own way in a backroom. They might be working on something cool, but it won't scale.

You need to select your technology platform, your processes, and your people so when your data scientist completes his or her initial pilot, they're using the approach, the processes, and the tools that can easily move the science project to production. Then you do the same thing, not once but 25 times, and you're on your way.

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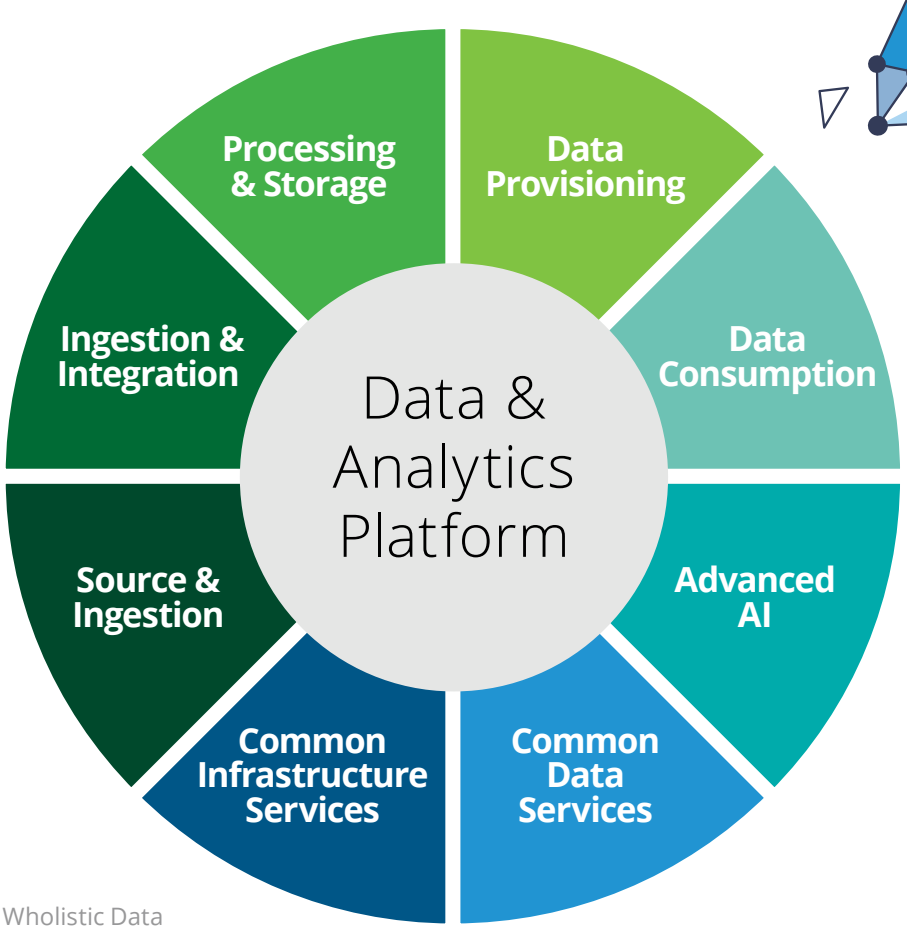
## Manage Data as an Asset by Investing in a Data Management Platform

AI deployed and driving value at enterprise scale must be built on a comprehensive data and analytics platform. As the diagram below shows, there are eight core capabilities this platform must possess, with tight integration and interoperability required across these eight capabilities. Such an approach is needed to prepare your data and make it fit to drive high-quality AI at scale.

Rather than buying numerous separate so-called "best-of-breed tools," you need a fully integrated data management solution. Companies should not have to endure the pain of stitching together point solutions, or suffer the inefficiencies of coding by hand, to manage their AI initiatives. Those approaches tend to result in increased cost and complexity, and much, much longer time to market.

And, as we frequently tell our clients, do you, as a healthcare company, want to compete on how fast or how well you integrate your disparate data management tools? Wouldn't you rather put your time, money and scarce people resources into high-value activities that drive innovation and competitive advantage delivering the best possible healthcare experiences and outcomes to your patients?

Note that the use of "data an asset" is more than simply a buzz phrase. Just as you have a chief financial officer (CFO) who oversees disciplined processes to ensure proper financial controls of assets — along with enterprise financial applications for managing these assets — you need a chief data officer who owns the processes and controls to ensure enterprise data is inventoried, cataloged and managed. And this chief data officer needs an enterprise data management platform to deliver on this responsibility.




Source: Deloitte Wholistic Data Modernization Framework

At Informatica®, we've long been recognized by customers and global analyst firms as a leader in cloud data management. Informatica's Intelligent Data Management Cloud™ delivers experiences for a broad set of enterprise roles, including technical and business.

Although it is certainly possible for healthcare organizations to find strong vendors in each of the categories that fall under the data and analytics umbrella — ingestion, source, processing, storage, provisioning and more — and try to stitch them together, they'd likely spend 90% of their effort integrating tools rather than getting value out of the data. A holistic data and analytics platform can give you all those capabilities, truly best in class, and already integrated. So, you have a Ferrari rather than a Frankenstein.

## Informatica's Intelligent Data Management Cloud delivers simplicity, productivity and scale through the following capabilities:

### Cloud-native at scale

Scale as you need for all enterprise workloads with elastic and serverless processing.

### AI-native at scale

Automate thousands of manual tasks and accelerate data-led transformations by applying AI and ML to data and metadata.

### Multi-cloud, multi-hybrid

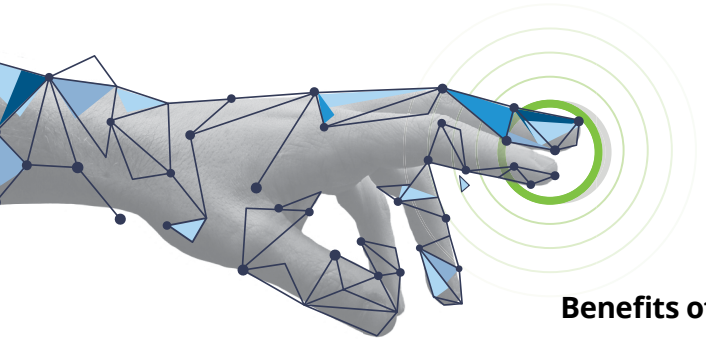
Run, interoperate, and support all combinations of multi-cloud and on-premises hybrid infrastructures.

### Low-code/no-code experience

Maximize agility by empowering the largest possible community of data practitioners within your organization.

### Security and trust as design principles

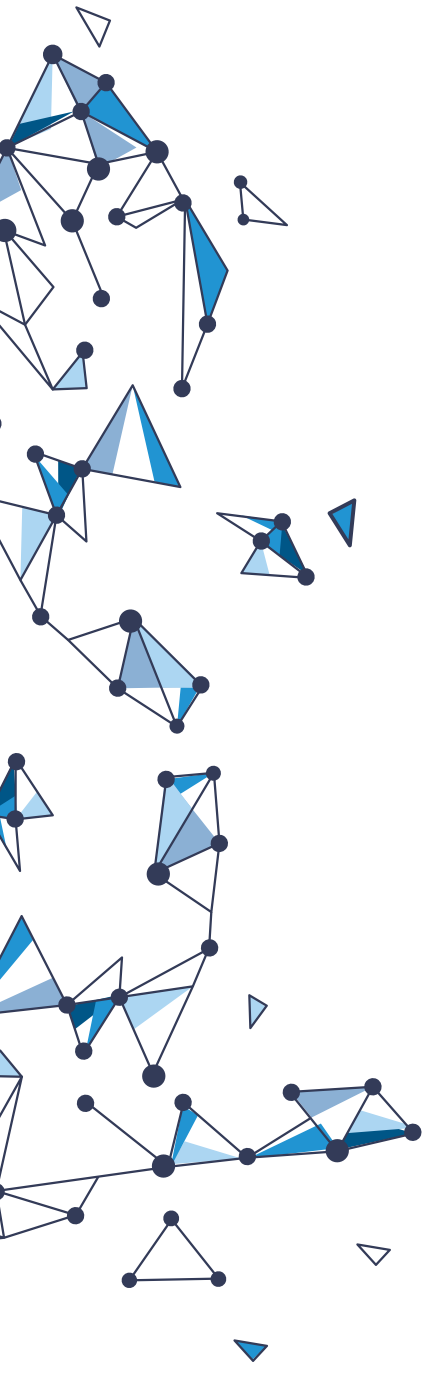
Ensure the highest level of security, consistent data quality, end-to-end data governance, and data privacy across the enterprise.



**Benefits of the Informatica Approach**

AI-powered and microservices-based, the Intelligent Data Management Cloud helps you to become more data-driven, develop more innovative products and services, and deliver exceptional consumer experiences.

## Here's how:



- Increase workforce productivity by empowering governed, trusted, self-service access for all data consumers.
- Boost revenue and profitability by operationalizing AI models and improving their accuracy by fueling them with high-quality, authoritative, trustworthy data.
- Enhance operational efficiency by simplifying and streamlining business processes and workflows.
- Reduce regulatory risk by ensuring the accuracy and protection of sensitive data.
- Increase agility and resilience by enabling 360-degree views of relationships between customers, products, and suppliers across the business.

The good news is that going with Informatica's Intelligent Data Management Cloud takes healthcare organizations into the future — giving them a finely tuned machine with parts that are designed to work seamlessly together. Which is why healthcare firms that are looking to reimagine healthcare through AI should not be trying to compete on their ability to select and integrate data-management tools. They should be looking to compete and deliver value on AI — and just leverage the data management technology that works.

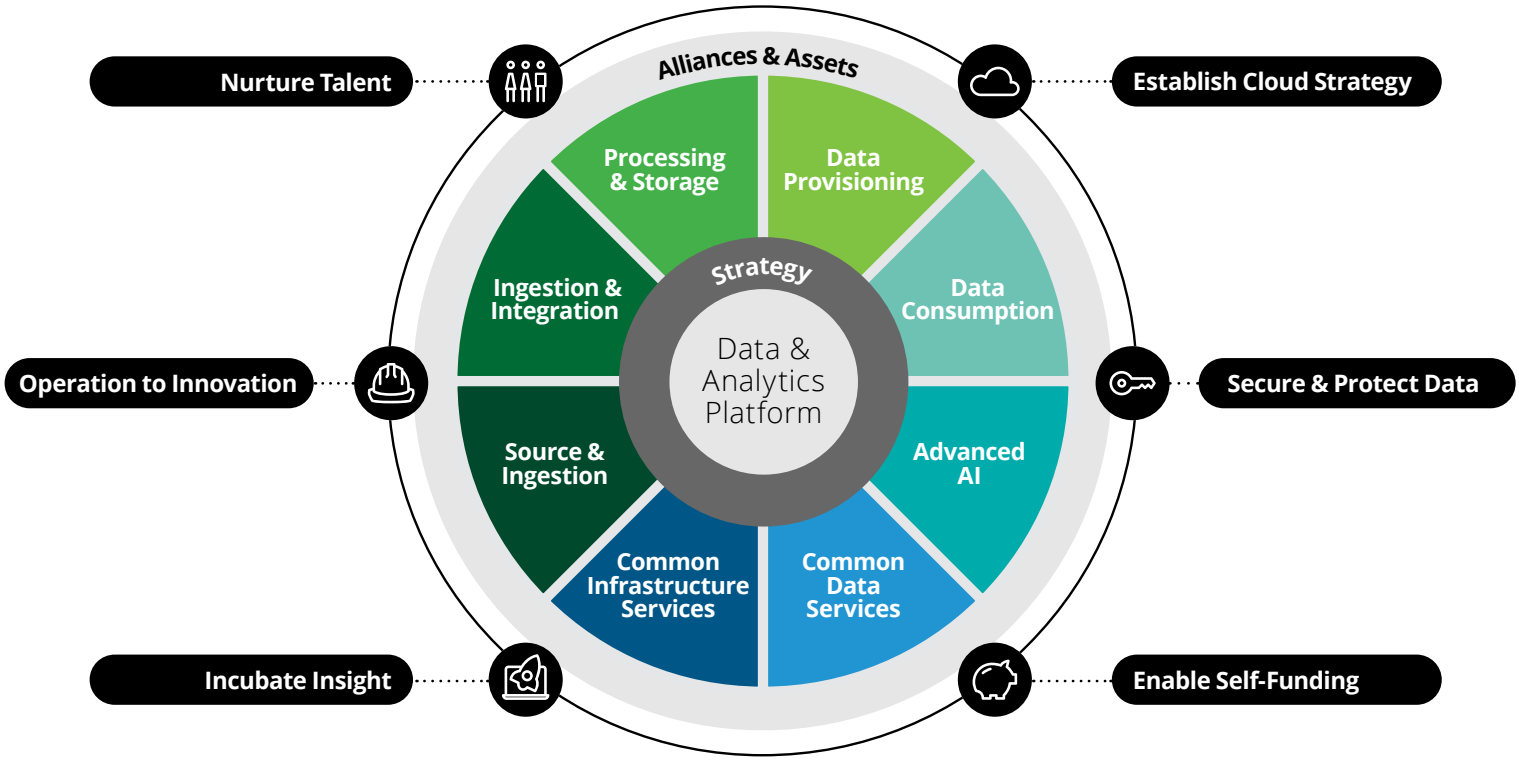
5

## Surround AI Technology Investments with a Holistic Data Modernization Framework

Now, as great as it is to deploy an integrated data and analytics technology platform, by itself it isn't enough. But we've seen in the market that most businesses focus almost entirely on that. What you need to do is surround that data and analytics framework with a strategy and, with required enablers, to achieve a **holistic data modernization framework.**

We put strategy in the center on purpose: because business strategy needs to inform everything else. It must drive the order in which you build everything, the capabilities you need, and the data you load into the platform.

In Deloitte's "Becoming an AI-fueled organization: Deloitte's State of AI in the Enterprise, 4th Edition," getting leaders on board with AI and analytics is a core best practice.[19]




Source: Deloitte Wholistic Data Modernization Framework

Key findings include that companies with the greatest AI successes do the following:

**Set and communicate a bold vision.**

Organizations with an enterprise-wide strategy and leaders who communicate a bold vision are 1.7 times as likely to achieve outcomes to a high degree.

**Look for ways AI can help achieve a differentiated strategy.**

Only 38% of respondents believe their use of AI differentiates them from competitors.

**Communicate your strategy transparently.**

Tell your workforce and the market about your strategy and the implications and trade-offs along the way.

After the strategy is in place, there are six enabling factors which are foundational to enabling the core technology capabilities:

## Establish a Cloud Strategy

You need to move to the cloud. Period. But you also need to do your research, especially if you are hoping to cut costs. In our experience, cloud can be more expensive than being on-premises if you don't do it right. Deloitte can help you build the business case for moving to the cloud and getting the most from the scalability, flexibility, and agility it offers.

## Nurture Talent

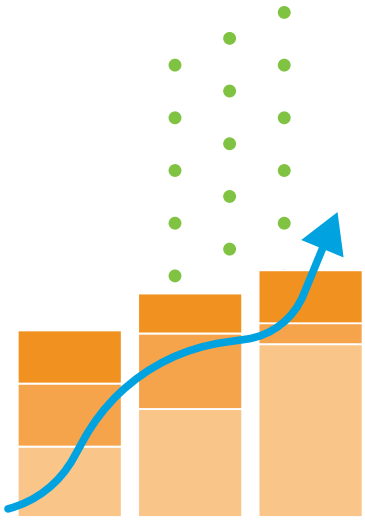
Moving to a new cloud-based data and analytics platform will have a huge impact on your talent. Your existing people will need to get upskilled. And you will probably need new people for new roles that previously didn't exist in your organization. You're also changing — in some cases — the way your money gets spent in terms of capital expenses (CapEx) versus operating expenses (OpEx).

And talent is another reason to choose an integration platform which is highly prevalent in the marketplace. If a healthcare or life sciences firm chooses a specialized, niche tool, they could have a difficult time hiring talent. They should be looking for a vendor with a unified platform that already offers a robust talent pool. With Deloitte by your side, you can plan to overcome these challenges and more.

## Move from Operation to Innovation

Most companies have some sort of data and analytics infrastructure already in place. When you are moving to a new cloud-based platform, you can't just turn it off. How are you going to operate these two platforms in parallel? How are you going to make the transition? There are many issues on the operations side you need to consider. Yet you also stand to save quite a bit of money as you move over, which you can use to drive more innovation. And you can continuously innovate once you have the foundation of your new data infrastructure built.

Deloitte offers end-to-end data services capabilities required to successfully make this complex transition. We do so by leveraging engagement and delivery models and financial constructs that address your unique needs.



"The breadth and depth of capabilities at Deloitte help us bring comprehensive, battle-tested solutions to our clients. This enables them to focus all their energy on unlocking the value of AI for their specific organization without reinventing the wheel or stumbling on common pitfalls."

— KEVIN ABRAHAM, SENIOR MANAGER, ANALYTICS & COGNITIVE, DELOITTE CONSULTING LLP

## Incubate Insight

You need to start with a small proof of concept. Often when you start, people will be very skeptical. It doesn't work to show them a PowerPoint presentation. Sometimes they will need to touch it and feel it and use it. This is what we call **incubation.** You want to take your highest-prized use case and do a quick proof of concept to show people that this is real and that you can actually do this. And this incubation almost inevitably leads to insight. Aha! They get it. And then they get excited and stand behind it.

At Deloitte, we help our clients kickstart their AI-led transformation journeys by building high-impact Phase-0 proofs of concept that can subsequently be scaled for impact.

## Secure and Protect Your Data

To protect one of your most important assets — your data — you must address data risk management through robust cybersecurity capabilities across data, applications, platforms and networks. Although cloud providers invest a lot in security, you can't just delegate security authority to them.

Cloud Service Providers will give you the tools, but you must put into place the right security measures to protect your data. Deloitte understands that cloud security is different from on-premises security. The principles may be the same, but the way you apply them varies. For example, despite having multiple clouds, you may want so-called single-pane-of-glass visibility into all of them. And how are you going to manage your data when it is in all these different places? Deloitte helps you achieve a focused approach to cloud security.

## Enable Self-Funding

As you begin to modernize your data systems and reinvent capabilities with AI and ML, don't overlook tax benefits. Many potential federal, state and international credits may be available depending on your particular pattern of investments and innovation. Deloitte can perform an early assessment to determine how qualifying expenses can help inform contracting, treatment of costs, and ROI assessments.

Deloitte can also:

- Estimate R&D tax credits through preliminary data assessment
- Use proprietary Deloitte technology to optimize detailed information analysis and create IRS-ready documents
- Document qualifying activities/projects and provide audit support

# Conclusion: Everything Comes Full Circle

A recent survey by Damo Consulting found that a full 79% of healthcare executives have made digital health initiatives their top priority, with 58% identifying investing in advanced analytics AI, the second-highest and only other clear priority identified in the survey.[20]

And further highlighting the need for a unified data management platform approach, 79% of senior healthcare C-suite executives identify data silos and lack of interoperability as the biggest roadblocks to their successful digital transformations.

You can avoid potential pitfalls when deploying AI and analytics by:

- Embracing the cloud wholeheartedly
- Accepting the reality of multi-cloud
- Deliberately focusing on hardening AI for production and scale
- Managing data as an asset by investing in a data and analytics management platform
- Surrounding AI technology investments with a holistic data modernization framework through a partner like Deloitte

And, even better, you can benefit enormously from these technologies by achieving improved population health, enhancing the quality of care for individual consumers and lowering costs across your entire ecosystem.

FOOTNOTES


1. https://www.hcinnovationgroup.com/policy-value-based-care/article/21203467/the-healthcare-innovation-2021-state-of-the-industry-survey-complex-horizons-ahead

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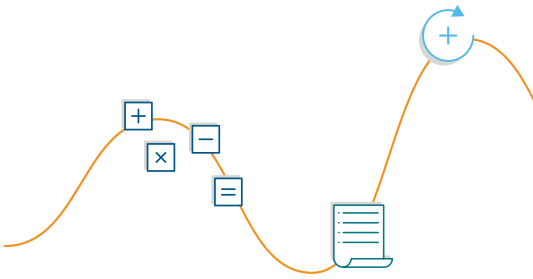

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