

eBook

# FOUR MUST-HAVES TO PUT AI INTO PRACTICE





# table of contents.

AI that helps you analyze and act 03

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1: Network Graphs to explain relationships within data 04

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2: A collaborative space that lets everyone contribute expertise 08

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3: Predictive analytics to see around corners 11

---

4: Prescriptive analytics that leverage AI to automate recommendations 14

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# AI that helps you analyze and act

**We all know the potential of AI is massive.** It can transform everyday business data into increased revenue, cost savings, and new business opportunities. But even with all of this potential, only 8% of organizations report that their frontline workers are using AI to enhance daily decisions. In this ebook, we explore the four must-haves for driving AI success in the business and bridging the gap between data science and business outcomes.

The latest trend in applied AI is 'no-code AI,' which aims to enable more organizations to build predictive systems without code. With such a shortage of data scientists, this option is really appealing. But we've all heard of AI gone horribly wrong—from applicant screening tools that are sexist in spite of being created to eliminate bias, to tools meant to underpin whole business lines but that got the fundamentals of the business completely wrong. And behind the high-profile stories of failures are hundreds of other attempts at AI that never got out of the experimentation phase.

The key to creating AI that works for and with the business is explainability. Seeing the data through the eyes of the AI model, understanding why it was shaped the way it was, and what to do with the predictions and prescriptions.

Explainable AI, paired with multi-dimensional visualizations that help the human brain consume the AI reasoning, provides both the guardrails against misuse and the opportunity for AI to extend beyond the realm of the data scientist safely. When both the business expert and the data scientist can explore together, the potential to apply AI practically is multiplied.

Discover the four key capabilities business leaders, data scientists and analysts should look for in an AI platform. And examples of how life science, financial service and Industry 4.0 companies are making smarter decisions across the enterprise with advanced analytics.

# 01

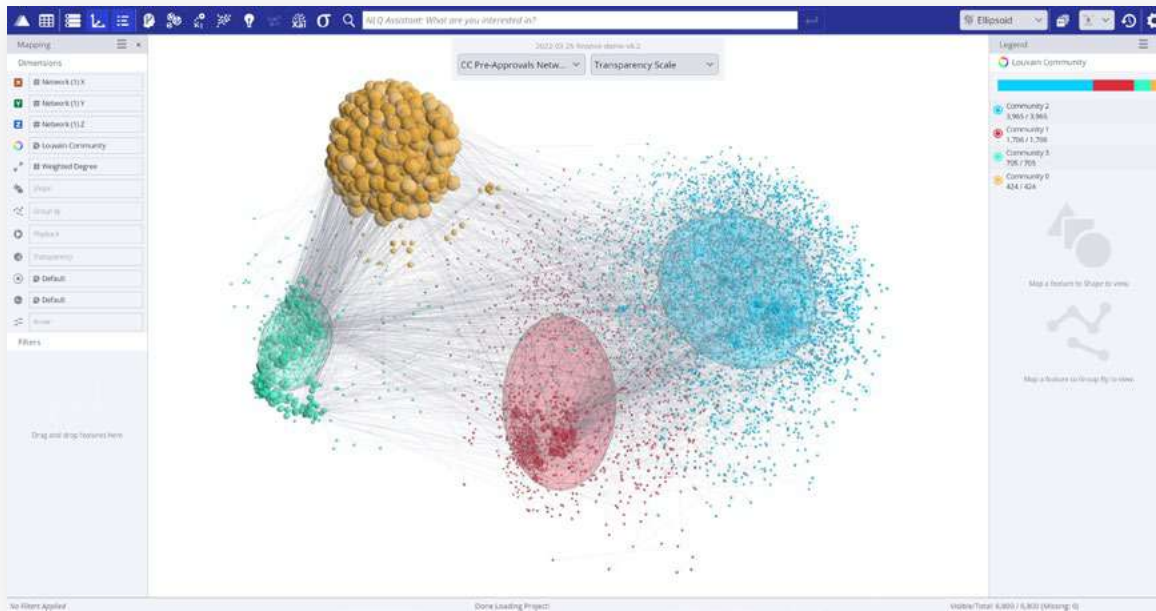
## Network Graphs to explain relationships within data

Network graphs visualize a network, by taking data in all kinds of formats and turning it into a visual model that shows relationships between each individual point. A network could be anything from a manufacturing supply chain to an electrical grid. Or booster vaccine recipients, TV news viewers or credit card holders.

Network graphs go beyond standard business intelligence analytics. They marry categorical data (descriptive groupings like gender, state of residence, job type) with numerical data (like household income, balance due and credit usage) so they can be analyzed in a single dataset.

These graphs allow you to model a lot more complexity than say, good and poor credit rating numbers. They expose the communities that exist within the dataset as the individual points that are similar are clustered together. That enables you to see how communities of card holders who defaulted or didn't are related. You can understand what ties them together.

An AI platform that creates network graphs doesn't simply visualize the communities—it actually finds the communities within the datasets using AI and describes what defines each one. It allows you to set a target like “who is most likely to default” then see groupings of customers and their characteristics as visualizations. A smart map identifies the features that matter most in defaults—and those that don't matter much at all. A plot graph sorts similar customers by color.



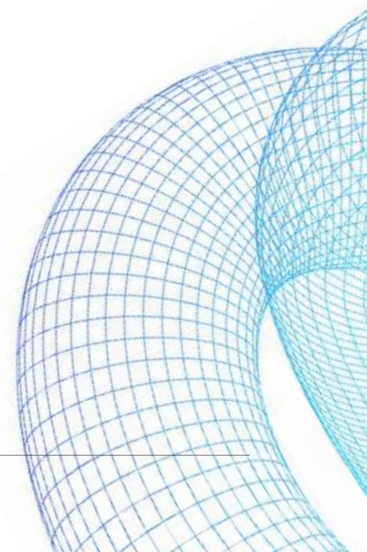
The Virtualitics Network Extractor finds and displays the relationships in your data, then guides you through the exploration so you can see your data the way AI does

## Exploring No-code AI in the Virtualitics AI Platform

- ▶ Virtualitics Explorer is [Explainable AI \(XAI\)](#). Descriptions of models, their expected impacts and potential biases are clearly visible. Conclusions are more trusted and reliable, helping assure your AI program stays compliant and responsible.
- ▶ Virtualitics' patented Network Extractor identifies, extracts, and spatializes networks within your tabular data with network analysis routines that are up to 100X faster than comparable tools (although, since it's patented, there's really nothing like it.)
- ▶ 3D visualizations show clearly relationships of communities within complex datasets without obscuring communities or distorting relationships, providing insight and clarity that flat, 2D visuals simply can't.
- ▶ Myriad sources of data can now be analyzed without the time-drain of lots of data preparation for network visualization.
- ▶ Numerical data and categorical data (descriptive groupings like gender, state of residence, education level) require no coding to include.
- ▶ Unstructured data (emails, Word documents, PowerPoints, survey responses, blog and social media posts, call center transcripts, etc.) gets fed into the platform and is parsed and analyzed to transform into usable values.

**“Conventional (relational) data models are burdened with initial assumptions about relationships between data – assumptions that are difficult to assess or revise. As a result, relational databases tend to capture only the most fundamental relationships between data elements, representing only a fraction of all possible relevant relationships between data elements.”<sup>1</sup>**

<sup>1</sup> Gartner, How Graph Techniques Deliver Business Value, March 2022, <https://www.gartner.com/document/4012095?ref=solrAll&refval=321997280>



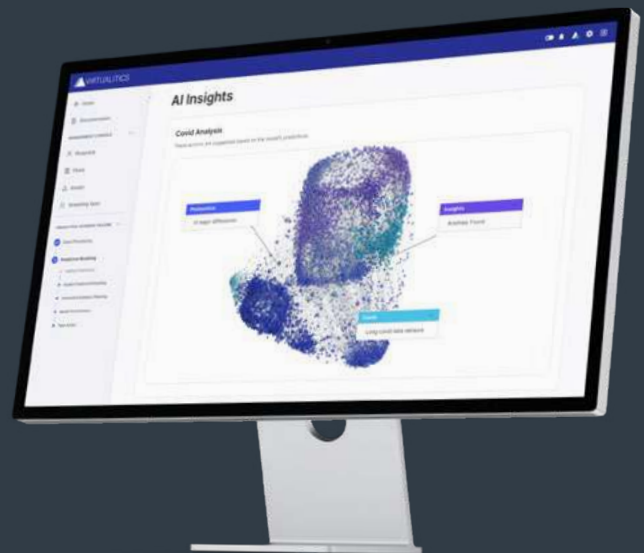
USE CASE

# Breakthroughs in identifying long COVID-19 vulnerability

The Institute for Systems Biology needed to identify critical trends in their data related to long COVID. Their data was largely unstructured and the data being collected by biologists wasn't in a form data scientists could work with. Faced with a skills shortage in big data, data analysis was a huge bottleneck.

With Virtualitics AI Platform, Institute researchers:

- ▶ Processed and validated information 100X faster than with traditional workflows.
- ▶ Leveraged relational data like patient genomic, metabolomic and clinical data to predict whether someone will be susceptible to long COVID.
- ▶ Used network graphs to identify, describe and analyze the communities of polyfunctional cells.
- ▶ Got a unified view useful to both data scientists and biologists.
- ▶ Used immersive visualizations to enable researchers to spot anomalies or outliers that could have been overlooked.
- ▶ Quickly identified trends in omics data and determined contributing factors to long COVID-19.
- ▶ Can now accurately diagnose long COVID based on indicative symptoms.



Virtualitics' patented visualizations makes advanced analytics accessible to non-data scientists and enables researchers to visualize and explore the connection between single-cell "omics" data and clinical data

# 02

## A collaborative space that lets everyone contribute expertise

The factors driving business success are often hard to wrap your head around. They're multi-faceted, interrelated, and complicated. When AI initiatives don't allow for collaborative problem-solving, it's hard for them to flourish.

AI insights do get traction when key stakeholders have the opportunity to infuse them with their own areas of expertise. An effective AI platform fosters collaboration among people from many disciplines and departments, who may be working from anywhere—remotely, in different time zones, in partnerships that cross departments or divisions.

Virtualitics AI Platform includes [Shared Virtual Office](#), a collaborative space where multiple users can connect, share visualizations, analyze data together, and discuss insights with colleagues. Before a critical business decision gets made, two data scientists can interrogate data, or a business leader and an analyst can meet to conduct Interactive Scenario Planning, to try out the impact of different changes.



## Shared Virtual Office: where AI-informed ideas are formulated

- ▶ Desktop, on-premise, cloud, and immersive virtual reality experiences are all enabled.
- ▶ Collaborative work happens within the platform, with native tools, instead of outside, with users using multiple, different tools.
- ▶ In VR mode, experience an immersive 3D environment where you can see each other's avatars that show where everyone is looking and pointing.
- ▶ In desktop mode, panel positions are synced and you can see who is interacting with which areas of a visualization or model.
- ▶ A role-based hierarchy lets Collaborators present, control what's viewed, and make changes to a visualization or model, and prevents Viewers from making changes on their own until enabled.



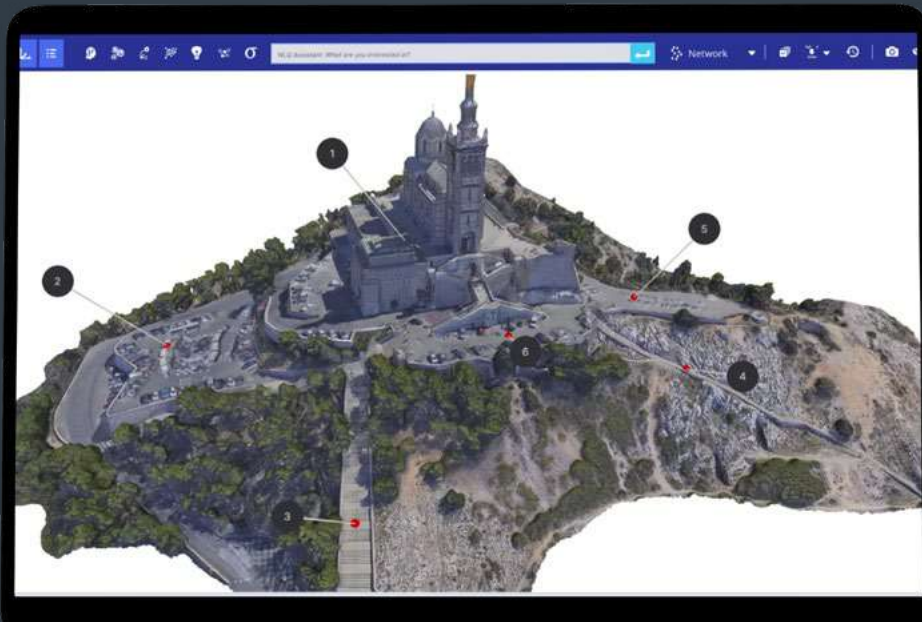
Whether it's a collaboration space on the desktop or web application, or using virtual reality to explore together in 3D, Virtualitics brings experts together

USE CASE

# Real-time collaboration from anywhere for Industry 4.0

AI-assisted collaboration is well suited for Industry 4.0 scenarios like exploring green building initiatives, making tweaks to supply chains, or modeling impacts of new vaccine requirements on a production line.

For example, an operations manager at an existing plant in Asia could review a digital twin of a building with the operations manager at another facility in Europe, collaborating on how to leverage smart building features for energy efficiency across the business. They can run scenarios and have a single, real-time view of changes as they work remotely. They might invite their boss to the session as a Viewer, then toggle to make her a full Collaborator with authority to make changes to the visualization or data model.



By putting AI insights into the context that subject matter experts are familiar with, you can make the best use of AI

# 03

## Predictive analytics to see around corners

Predictive analytics let you understand and identify patterns and trends. It's the practice of taking current and historical data and using statistical modeling, machine learning, and AI to predict likely outcomes. Think of it like weather forecasting but for things like equipment maintenance, supply chain disruption, promising drug therapies, or the likelihood of a foreclosure.

Predictive analytics can help a business see new opportunities, reduce costs, mitigate risk, or increase sales. It can also reveal relationships between variables and allow for scenario modeling. Although predictive analytics isn't accurate 100 percent of the time, it is much more reliable than a hunch or an assumption. It paves the way for making critical decisions based on data.



Useful predictions enable frontline workers to take action to streamline operations

## Virtualitics Predict keeps insights usable and your model up to date

- ▶ Our platform uses advanced, no-code AI and machine learning to identify key trends and predict future outcomes.
- ▶ Highlight pockets of engagement when preemptive action could make a significant difference, like intervening to head off missed or late credit card payments.
- ▶ Test out what-ifs with an Interactive Scenario Planning tool.
- ▶ Track the accuracy performance of your model. Virtualitics shows the performance of the model you've built vs standard benchmark models. You can track this over time and know when it may need to be revised.
- ▶ Collaborate on an interface built for multiple types of users, from business users to data scientists to analysts to citizen data scientists.
- ▶ Trace the throughline from the prediction back to the data that informed it with the visualizations that illustrate the relationships between the data, ensuring that your predictions are built on the right foundation.

2x  
as likely

Companies that use predictive analytics are twice as likely to be able to target high-value customers.<sup>2</sup>

<sup>2</sup> <https://emerj.com/ai-sector-overviews/predictive-analytics-for-marketing-whats-possible-and-how-it-works/>

USE CASE

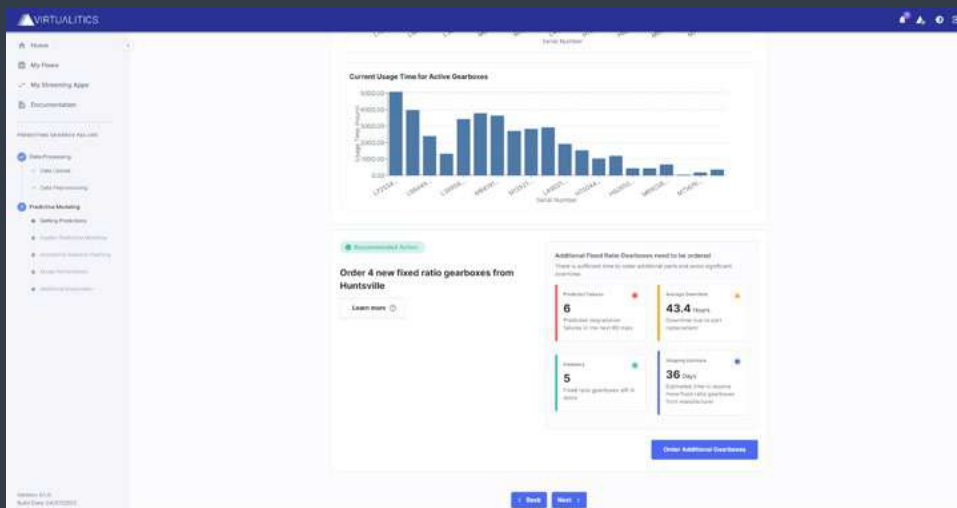
# Increasing up-time with predictive maintenance

Downtime for US Air Force aircraft due to maintenance issues carries a massive cost upwards of \$28,000 per hour, in addition to threatening readiness.

Crews were struggling to predict downtime and take preventive action, such as ordering the right parts for the right locations at the right times. The data being collected by maintenance crews and systems logs couldn't be mined for meaningful information because of the disparate and unstructured formats.

Using the Virtualitics AI Platform, USAF:

- ▶ Formatted and processed 7 years of historical data, including free-text notes used by aircraft maintainers, equipment logs, flight activity records, and weather data.
- ▶ Created a maintenance reporting dashboard to plan for upcoming maintenance within current workflows and systems.
- ▶ Reduced unscheduled maintenance events by half.
- ▶ Reduced annual maintenance costs by a projected \$15M.

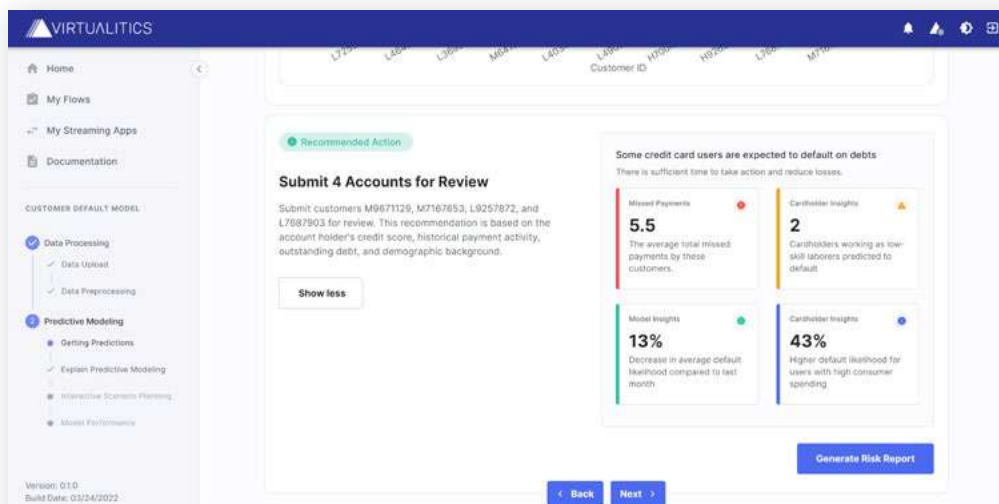


The Virtualitics AI Platform predicts parts failure, illustrate the forces behind parts failure, and embedded a one-click action enabling the maintenance engineer to order the necessary parts, all from one place

# 04

## Prescriptive analytics that leverage AI to automate recommendations

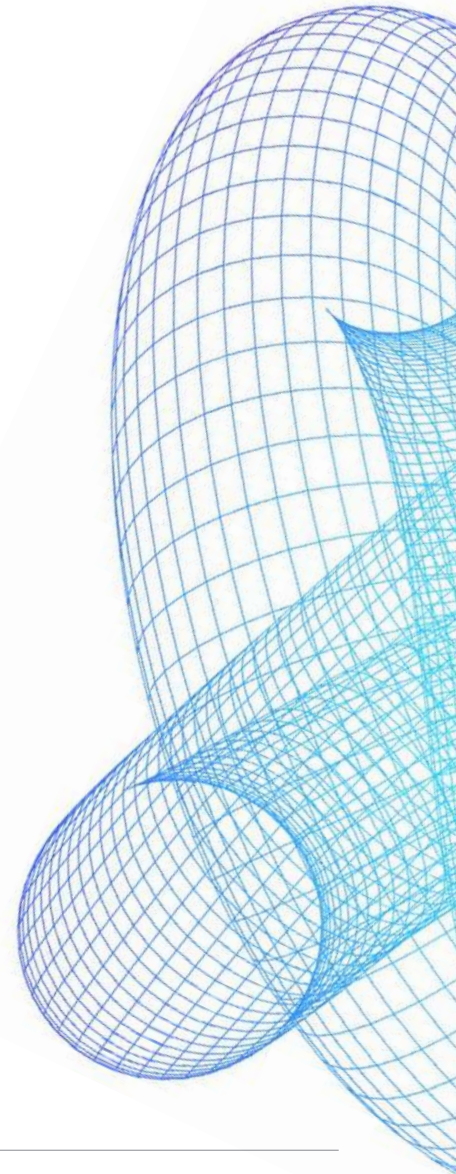
Prescriptive analytics closes the gap between endless analysis of data and action taken in day-to-day work. It delivers AI-generated recommendations that point decision-makers to the best next steps. For example, a financial services company can find out the likelihood of defaults among specified accounts, understand why those accounts were flagged, then intervene with specific actions.



Provide direction to end users, while also giving them the 'why' behind the recommendations so they can make the right decision in the moment

## Virtualitics Prescribe moves you from predictions to actions in one place

- ▶ The Virtualitics AI Platform lets you see what's ahead and take action in a single move, right in the platform.
- ▶ Our prescription app generates recommendations in plain English.
- ▶ It shows how well your model is working over time.
- ▶ Our platform is integrated with business systems that carry out recommendations. Flow ideas into action with collaborative input and without friction.
- ▶ You can even choose to automate actions, such as sending a part order right to the inventory system, directly from Virtualitics.



## How financial services companies can find needles in haystacks

Billions of dollars are transferred every day through millions of individual transactions, big and small. Financial services companies can automatically run AI routines in real time, flagging transactions of concern, either for automatic intervention (credit card freeze, for example) or for a review and intervention by a customer service agent. They can keep ahead of sophisticated fraudsters with visual insight into drivers and AI models that are maintained by Virtualitics' Data Scientists.

Other common use cases for AI in financial services include:

- ▶ Asset and portfolio management.
- ▶ Anti-money laundering and fraud prevention efforts.
- ▶ Product upselling recommendations
- ▶ Retention, sentiment and churn analysis
- ▶ Insider trading monitoring.
- ▶ Data breach detection.

44%

44% of executives whose companies have adopted AI report that AI has reduced costs.<sup>4</sup>

<sup>4</sup> <https://www.mckinsey.com/featured-insights/artificial-intelligence/global-ai-survey-ai-proves-its-worth-but-few-scale-impact>



# Practical decision intelligence for the enterprise

Companies that understand the full dimensions of their data are positioned to achieve major gains—increased sales, reduced costs, improved risk mitigation. But only half of AI projects make it from pilot into production.<sup>5</sup>

For AI to work for a business, it needs to provide more than impressive illustrations of data. Analysis and action have to be seamless and allow for collaboration. Questions and answers need to be in a language that everyone—data scientist, analysts, citizen data scientist and business decision-maker—understands. Data models have to be explainable, so people can trust in recommendations. It has to be easy to feed in datasets in all kinds of formats.

The [Virtualitics AI Platform](#) encourages and automates the best practices to mitigate risk while speeding up your time to production. You're given the capabilities to take predictive systems from exploration and ideation to deployment without skipping steps to ensure responsible usage of AI. We've made it our mission to be at the forefront of the AI movement to close the explainability gap. By providing highly visual and explainable AI models, not only can the data science teams evaluate and test the models, but so can the subject matter experts, ensuring that the AI is developed and applied as intended.

<sup>5</sup> <https://www.gartner.com/en/newsroom/press-releases/2021-09-07-gartner-identifies-four-trends-driving-near-term-artificial-intelligence-innovation>

## Where We Fit in Your Analytics Ecosystem

The Virtualitics AI Platform adds practical AI—AI that goes from investigation to production—to your analytics ecosystem. Ingesting data from anywhere and in any format, our solution sits alongside the other tools in your toolkit, applying AI routines to extract networks and create insight from your data, and finally creating applications that anyone can use to take action. Virtualitics amplifies the power of your data science team to scale AI across the organization.

# See how our ready-to-deploy solution

can help businesses better support customers, make smarter investments and keep operations running more smoothly.

**Learn more →**

## About Virtualitics

Virtualitics, Inc. is an advanced analytics company that helps enterprises and governments make smarter business decisions faster, with ready-to-use AI that can be understood by analysts and business leaders alike. Our patented technology is based on over 11 years of research at the California Institute of Technology and NASA Jet Propulsion Laboratory.