These trends can help data and analytics leaders navigate their COVID-19 response and recovery and prepare for a post-pandemic reset.

In response to the COVID-19 emergency, over 500 clinical trials of potential COVID-19 treatments and interventions began worldwide. The trials use a living database that compiles and curates data from trial registries and other sources. This helps medical and public health experts predict disease spread, find new treatments and plan for clinical management of the pandemic.

Data and analytics combined with artificial intelligence (AI) technologies will be paramount in the effort to predict, prepare and respond in a proactive and accelerated manner to a global crisis and its aftermath.

"In the face of unprecedented market shifts, data and analytics leaders require an ever-increasing velocity and scale of analysis in terms of processing and access to accelerate innovation and forge new paths to a post-COVID-19 world," said Rita Sallam, Distinguished VP Analyst, during her presentation at virtual Gartner IT Symposium/Xpo™ 2020 .

Here are the top 10 technology trends that data and analytics leaders should focus on as they look to make essential investments to prepare for a reset.

Trend 1: Smarter, faster, more responsible AI

By the end of 2024, 75% of enterprises will shift from piloting to operationalizing AI, driving a 5X increase in streaming data and analytics infrastructures.

Within the current pandemic context, AI techniques such as machine learning (ML), optimization and natural language processing (NLP) are providing vital insights and predictions about the spread of the virus and the effectiveness and impact of countermeasures. AI and machine learning are critical realigning supply and the supply chain to new demand patterns.

Pre-COVID models based on historical data may no longer be valid

AI techniques such as reinforcement learning and distributed learning are creating more adaptable and flexible systems to handle complex business situations; for example, agent-based systems can model and stimulate complex systems – particularly now when pre-COVID models based on historical data may no longer be valid.

Significant investments made in new chip architectures such as neuromorphic hardware that can be deployed on edge devices are accelerating AI and ML computations and workloads and reducing reliance on centralized systems that require high bandwidths. Eventually, this could lead to more scalable AI solutions that have higher business impact.

Responsible AI that enables model transparency is essential to protect against poor decisions. It results in better human-machine collaboration and trust for greater adoption and alignment of decisions throughout the organization.

Trend 2: Decline of the dashboard

Dynamic data stories with more automated and consumerized experiences will replace visual, point-and-click authoring and exploration. As a result, the amount of time users spend using predefined dashboards will decline. The shift to in-context data stories means that the most relevant insights will stream to each user based on their context, role or use. These dynamic insights leverage technologies such as augmented analytics, NLP, streaming anomaly detection and collaboration.

Data and analytics leaders need to regularly evaluate their existing analytics and business intelligence (BI) tools and innovative startups offering new augmented and NLP-driven user experiences beyond the predefined dashboard.

Trend 3: Decision intelligence

By 2023, more than 33% of large organizations will have analysts practicing decision intelligence, including decision modeling.

Decision intelligence brings together a number of disciplines, including decision management and decision support. It encompasses applications in the field of complex adaptive systems that bring together multiple traditional and advanced disciplines.

It provides a framework to help data and analytics leaders design, compose, model, align, execute, monitor and tune decision models and processes in the context of business outcomes and behavior.

Explore using decision management and modeling technology when decisions need multiple logical and mathematical techniques, must be automated or semi-automated, or must be documented and audited.

Trend 4: X analytics

Gartner coined the term "X analytics" to be an umbrella term, where X is the data variable for a range of different structured and unstructured content such as text analytics, video analytics, audio analytics, etc.

Data and analytics leaders use X analytics to solve society's toughest challenges, including climate change, disease prevention and wildlife protection.

During the pandemic, AI has been critical in combing through thousands of research papers, news sources, social media posts and clinical trials data to help medical and public health experts predict disease spread, capacity-plan, find new treatments and identify vulnerable

populations. X analytics combined with AI and other techniques such as graph analytics (another top trend) will play a key role in identifying, predicting and planning for natural disasters and other business crises and opportunities in the future.

Data and analytics leaders should explore X analytics capabilities available from their existing vendors, such as cloud vendors for image, video and voice analytics, but recognize that innovation will likely come from small disruptive startups and cloud providers.

Trend 5: Augmented data management

Augmented data management uses ML and AI techniques to optimize and improve operations. It also converts metadata from being used in auditing, lineage and reporting to powering dynamic systems.

Augmented data management products can examine large samples of operational data, including actual queries, performance data and schemas. Using the existing usage and workload data, an augmented engine can tune operations and optimize configuration, security and performance.

Data and analytics leaders should look for augmented data management enabling active metadata to simplify and consolidate their architectures, and also increase automation in their redundant data management tasks.

Trend 6: Cloud is a given

By 2022, public cloud services will be essential for 90% of data and analytics innovation.

As data and analytics moves to the cloud, data and analytics leaders still struggle to align the right services to the right use cases, which leads to unnecessary increased governance and integration overhead.

The question for data and analytics is moving from how much a given service costs to how it can meet the workload's performance requirements beyond the list price.

Data and analytics leaders need to prioritize workloads that can exploit cloud capabilities and focus on cost optimization and other benefits such as change and innovation acceleration when moving to cloud.

Trend 7: Data and analytics worlds collide

Data and analytics capabilities have traditionally been considered distinct capabilities and managed accordingly. Vendors offering end-to-end workflows enabled by augmented analytics blur the distinction between once separate markets.

The collision of data and analytics will increase interaction and collaboration between historically separate data and analytics roles. This impacts not only the technologies and capabilities provided, but also the people and processes that support and use them. The spectrum of roles will extend from traditional data and analytics roles in IT to information explorer, consumer and citizen developer as an example.

To turn the collision into a constructive convergence, incorporate both data and analytics tools and capabilities into the analytics stack. Beyond tools, focus on people and processes to foster communication and collaboration. Leverage data and analytics ecosystems enabled by an augmented approach that have the potential to deliver coherent stacks.

Trend 8: Data marketplaces and exchanges

By 2022, 35% of large organizations will be either sellers or buyers of data via formal online data marketplaces, up from 25% in 2020.

Data marketplaces and exchanges provide single platforms to consolidate third-party data offerings. These marketplaces and exchanges provide centralized availability and access (to X analytics and other unique data sets, for example) that create economies of scale to reduce costs for third-party data.

To monetize data assets through data marketplaces, data and analytics leaders should establish a fair and transparent methodology by defining a data governance principle that ecosystems partners can rely on.

Trend 9: Blockchain in data and analytics

Blockchain technologies address two challenges in data and analytics. First, blockchain provides the full lineage of assets and transactions. Second, blockchain provides transparency for complex networks of participants.

Outside of limited bitcoin and smart contract use cases, ledger database management systems (DBMSs) will provide a more attractive option for single-enterprise auditing of data sources. By 2021, Gartner estimates that most permissioned blockchain uses will be replaced by ledger DBMS products.

Data and analytics should position blockchain technologies as supplementary to their existing data management infrastructure by highlighting the capabilities mismatch between data management infrastructure and blockchain technologies.

Trend 10: Relationships form the foundation of data and analytics value

By 2023, graph technologies will facilitate rapid contextualization for decision making in 30% of organizations worldwide. Graph analytics is a set of analytic techniques that allows for the exploration of relationships between entities of interest such as organizations, people and transactions.

It helps data and analytics leaders find unknown relationships in data and review data not easily analyzed with traditional analytics.

For example, as the world scrambles to respond to current and future pandemics, graph technologies can relate entities across everything from geospatial data on people's phones to facial-recognition systems that can analyze photos to determine who might have come into contact with individuals who later tested positive for the coronavirus.

Consider investigating how graph algorithms and technologies can improve your AI and ML initiatives

When combined with ML algorithms, these technologies can be used to comb through thousands of data sources and documents that could help medical and public health experts rapidly discover new possible treatments or factors that contribute to more negative outcomes for some patients.

Data and analytics leaders need to evaluate opportunities to incorporate graph analytics into their analytics portfolios and applications to uncover hidden patterns and relationships. In addition, consider investigating how graph algorithms and technologies can improve your AI and ML initiatives.

This article has been updated from the June 9, 2020 original to reflect new events, conditions and research.