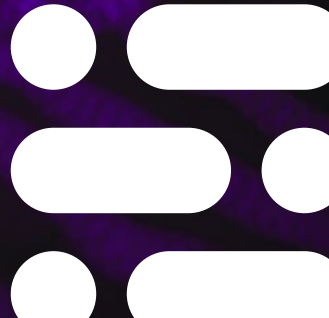● eBook

Top Projected Trends in Machine Learning for 2023

**Swapnil Srivastava, Saikat Choudhury, Arjun Vishwanath**

Let's Talk ML

It's been 67 years since Stanford professor John McCarthy defined artificial intelligence as **"the science and engineering of making intelligent machines."**

Machine learning (ML) helps businesses find insights hidden in huge quantities of data while avoiding expensive and time-consuming traditional methods of analysis.

This guide will walk you through the **top trends in ML for 2023** and provide some examples of how it can help your business.
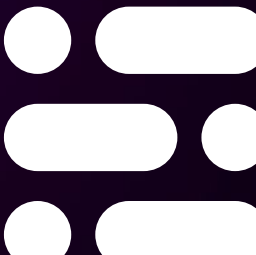
Refresher: What is Machine Learning?

Machine learning (ML) algorithms use data to learn, adapt, recommend, and draw inferences. Unlike rules-based programs, **ML algorithms become more accurate as they iterate**.

Machine learning has already become one of the most common forms of AI in the business world. The creation of incredible amounts of data and the inception of deep learning and artificial neural networks fueled the rise of ML.

Companies often deploy ML to **reveal insights hidden in huge quantities of data** that no humans could study at that scale or pace.
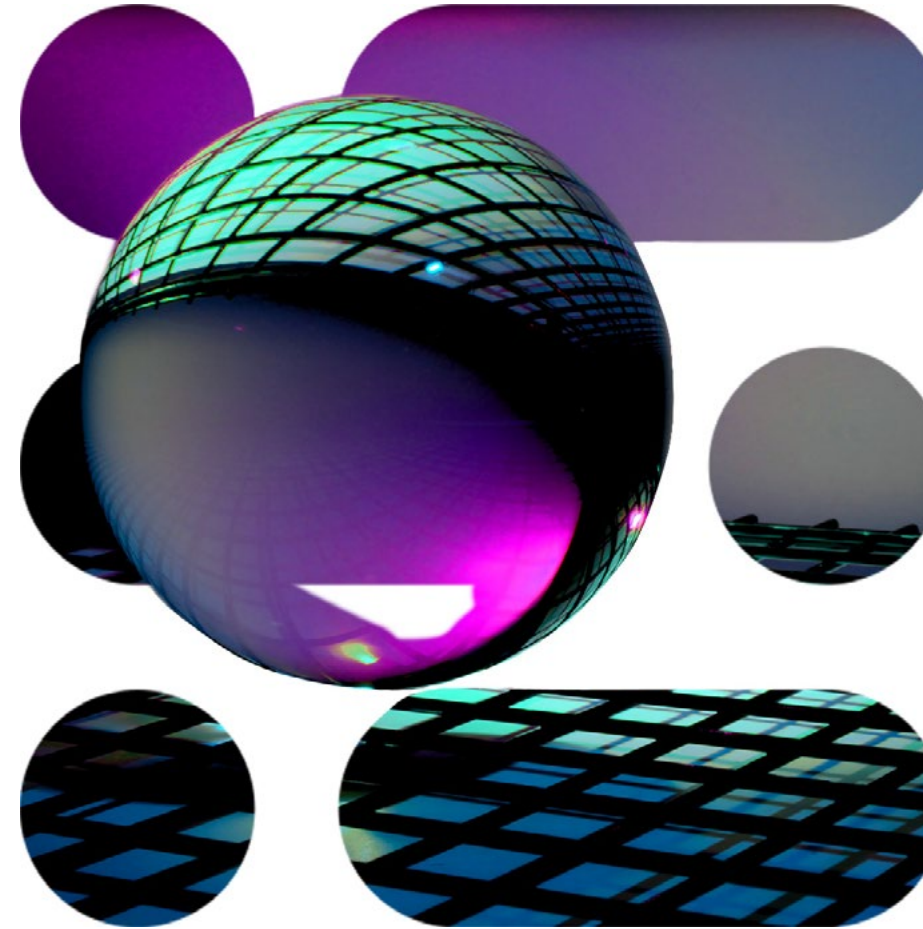
Trend 1: Rise of MLOps

Machine Learning Operations (MLOps) is a practice that **improves ML model accuracy and efficiency.** The complex and compounding challenges generated by multiple stakeholders implementing ML create the need for the practice.

By 2025 the MLOps market is expected to expand to almost **$ 4 billion.**

Source: 2021 Deloitte report

Trend 2: Data Governance

Organizations realize a solid data and ML governance strategy is critical to delivering value through their ML efforts while ensuring standardization and ownership.

> TechBeacon says, "Operating ML models without good governance in place allows flawed processes to produce unwanted results – often quickly and repeatedly."

Trend 3: Use of Third-Party Data

Companies realize that **only using internal data leaves gaps in their understanding of the market**. To address this need, businesses are increasingly making use of publicly available reports, news, and records.

The MIT Sloan Management Review found that analytically mature businesses were more likely to leverage external data sources, such as customers, vendors, regulators, and competitors.

Third-Party Data Use Case: Pricing Simulator

Challenge
A B2B industrial manufacturer found pandemic market shifts made its pricing process more complex and challenging. It wanted to optimize its pricing and improve margins to remain competitive.

Solution
The industrial manufacturer built a cloud-based pricing simulator powered largely by third-party data – the competition's pricing data.

How It Works
The pricing simulator **combined internal pricing data with third-party data from scraping the web.** Data engineers, scientists, and developers improved data quality, governance, and workflows to improve model accuracy and maintain platform usability.

Benefit
The industrial manufacturer adjusted their pricing to reflect market conditions and competitor responses. One of the industrial manufacturer's business units experienced a $1.25 million margin increase.

Trend 4: No and Low-Code ML Platforms

Users create custom programs by **dragging and dropping algorithms**. No- and low-code platforms provide companies challenged by hiring tech- and AI-skilled workforces with access to ML.

70% of new applications will use no-/low-code **by 2025**.
Less than **25%** used the tech in **2020**.[1]

1   https://www.gartner.com/en/newsroom/press-releases/2021-11-10-gartner-says-cloud-will-be-the-centerpiece-of-new-digital-experiences
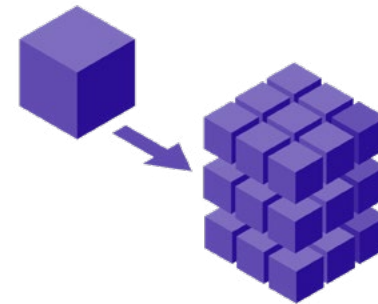
Trend 5: Microservices

Organizations are adopting microservices architectures, which **use smaller, modular, independent software pieces** to complete specific tasks. Different microservices use APIs to interface with each other and achieve the same functions as a broader application.

46% of organizations were developing or migrating at least a quarter of their systems to microservices

Source: 2020 O'Reilly report

Microservices Use Case: Automated Financial Spreading

Challenge
The pricing simulator combined internal pricing data with third-party data from scraping the web. Data engineers, scientists, and developers improved data quality, governance, and workflows to improve model accuracy and maintain platform usability.

Solution
An automated financial spreading program uses ML microservices to automatically capture desired information from those unstructured reports.

How It Works
The financial spreading program pulls in data using an API, then uses optical character recognition (OCR) to parse that data and identify where tables are.

Benefit
The financial spreading program extracts data from financial statements 70% faster, and the model is 99.6% accurate.

Trend 6: ML in Embedded Analytics

Embedded analytics is when **data analysis happens in a user's usual platform or workflow.** Users no longer have to interrupt their work to go to another portal and access analytics information.

Real-time analytics at a much lower cost can be a huge advantage of embedding analytics.

ML and Embedded Analytics Use Case: Intel Smart Scale

Carrots
Quality Score: 98%
Expiration: 12 days

Opportunity

Intel saw an opportunity to improve customer experience in grocery store environments by creating smart scales with computing capabilities that would automatically identify and price produce.

Solution

Intel and Evalueserve co-developed the AI for smart scales that leveraged the Internet of Things (IoT) in grocery stores. The AI was placed on chips in the Smart Scale product.

How It Works

Advanced computer vision and AI technologies were embedded in chips in the smart scales. The scale adds data from its interactions to its database, improving customer experience over time.

Benefit

The smart scales **detect and weigh fresh produce within 0.1 seconds**, eliminating the need to punch in SKUs manually. We reduced inference time on embedded Smart Scale processors by more than 50%, decreasing thermal design power (TDP) and increasing performance.

Trend 7: Domain-Specific ML

Machine learning is increasingly domain-specific, meaning data scientists select **algorithms built for the specific industry or job function** addressed by the project. Domain knowledge helps data scientists save time with ML models that already fit the business need and **require fewer iterations to meet the use case**.

Subject matter expertise is crucial to defining the use case and developing successful ML models.

Domain-Specific ML Use Case: Diagnosing Alzheimer's with ML and AI

Challenge

A medical research organization (MRO) wanted to improve Alzheimer's testing accuracy to better diagnose patients, save time and lower costs so more patients could be screened.

## Solution

The MRO began using medical-industry-specific computer vision algorithms to score Clock Drawing Tests (CDTs). Data analysts used **doctors' domain knowledge to train the model,** providing scoring and diagnosis information.

How It Works

Patients were told to draw a clock with the hands pointing at a particular time. The algorithm uses results to assess and diagnose neurological and cognitive impairments – in this case, Alzheimer's disease.

Benefit

The computer vision algorithms **improved accuracy by eliminating human error and emotion-driven diagnoses.** This allowed for more patients to be tested with greater speed and accuracy. It also lowered costs.
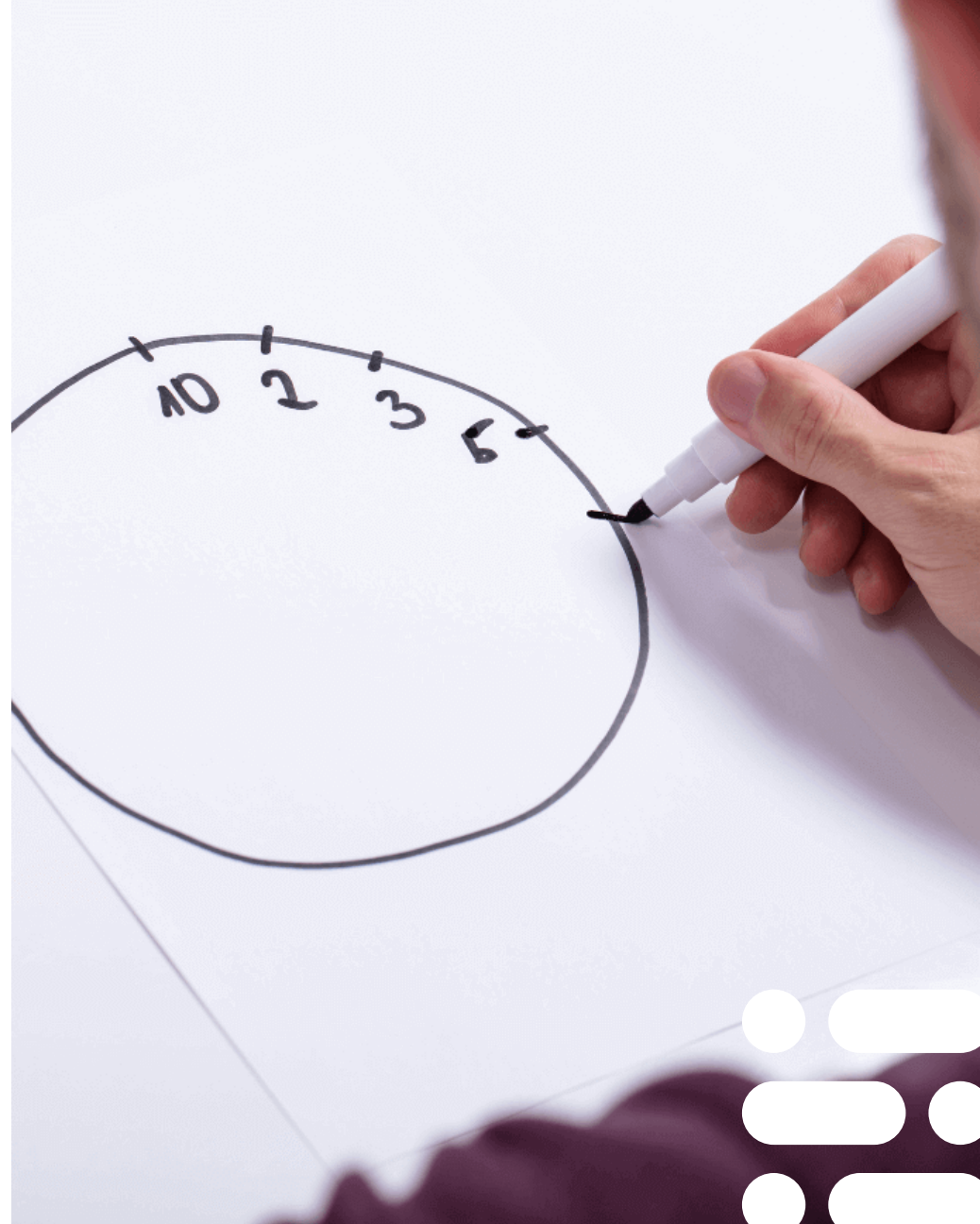
Trend 8: Multi-Modal Learning

Multi-modal learning **teaches a machine to process data and information from multiple modalities at once.** A multi-modal learning project might combine Natural Language Processing (NLP) with computer vision.

ML Creates Business Outcomes for Bayer and Makes Agriculture Smarter

Challenge
Bayer wanted to create a product that would better identify and address challenges presented by pests.

Solution
Bayer's Crop Protection Innovation Lab created the "Digital Yellow Trap" to alert farmers when pests are present.

How It Works
Bayer's device uses image recognition, taking multiple photos every day and identifying pests. Based on what it captures, **the app provides farmers with recommendations to protect their crops.**

Benefit
ML reduced Bayer's Crop Protection Innovation Lab's architecture costs by 94%, and the solution scaled as necessary to support farmer demand. Thanks to ML and AI, the Digital Yellow Trap can handle tens of thousands of requests every second.

Conclusion

ML advances and adoption continue to soar. ML has many invaluable use cases and seemingly endless potential – which continues to grow with new capabilities and trends – to create business impact.

Build ML into your organization's systems and processes to filter through all the data noise.

Businesses need to explore how they can use ML to optimize their processes and make the most of their resources, or they will be left behind.

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