How Businesses Are Using AI

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Common Business Applications of AI

Organizations use artificial intelligence to strengthen data analysis and decision-making, improve customer experiences, generate content, optimize IT operations, sales, marketing and cybersecurity practices. AI is used as a tool to support a human workforce in optimizing workflows and making business operations more efficient. These gains are made in various ways, including using AI to automate repetitive tasks, quickly process vast amounts of data sets and extract meaningful insights, and predict future outcomes based on data analysis. AI systems power several types of business automation, helping to reduce human error and free up human workforces for higher-level work. (Source: www_ibm_com__c0f7a40a9c452b3a::c0000)

Companies are using machine learning in several ways, including recommendation algorithms that power product suggestions and social media feeds, image analysis for business intelligence purposes, fraud detection systems that analyze patterns to identify potentially fraudulent transactions, and online chatbots that use machine learning and natural language processing to interact with customers. Small businesses are using AI tools for various functions, including solving problems before they happen by tracking traffic and flight delays, monitoring floodplains to prepare for disaster damage, safeguarding data through automated security functions, analyzing data to make strategic decisions, and handling repeat tasks such as programming meetings and sorting email. (Source: mitsloan_mit_edu__b85f152879c15db1::c0009, www_sba_gov__f3b30e5beeef2707::c0001)

Examples Across Industries

In the manufacturing industry, artificial intelligence can help manufacturing leaders automate their business processes by applying data analytics and machine learning to applications such as identifying equipment errors before malfunctions occur. Computer vision can be implemented in production lines to detect minor defects during the manufacturing process. Some organizations use an AI application on a device located within a factory that monitors a production machine and predicts when to perform maintenance. (Source: ai_engineering_columbia_edu__8662d32a1c231998::c0002, www_ibm_com__c0f7a40a9c452b3a::c0003)

Data privacy and security are especially critical within the banking industry. Financial services leaders can keep customer data secure while increasing efficiencies using AI and machine learning in several ways, including using machine learning to detect and prevent fraud and cybersecurity attacks, integrating biometrics and computer vision to quickly authenticate user identities and process documents, and incorporat-

ing smart technologies such as chatbots and voice assistants to automate basic customer service functions. (Source: ai_engineering_columbia_edu__8662d32a1c231998::c0003)

The health care field uses huge amounts of data and increasingly relies on informatics and analytics to provide accurate, efficient health services. AI tools can help improve patient outcomes by analyzing data from users' electronic health records through machine learning to provide clinical decision support and automated insights, integrating an AI system that predicts the outcomes of hospital visits to prevent readmissions, and capturing and recording provider-patient interactions using natural-language understanding. (Source: ai_engineering_columbia_edu__8662d32a1c231998::c0003, mitsloan_mit_edu__b85f152879c15db1::c0010)

Retailers are using AI-powered shopping tools to help customers make purchasing decisions. Some large retail chains are building or supporting their own AI-powered shopping tools rather than relying only on third-party platforms. These tools can take into account factors such as time limits or meal plans, while also drawing on data the retailer already has, including price sensitivity and brand preferences. The intent is to keep purchasing decisions within the retailer's own systems rather than handing them off to external platforms. (Source: www_artificialintelligence_news_com__f00bf123dd759632::c0000, www_artificialintelligence_news_com__f00bf123dd759632::c0001)

Organizational and Strategic Considerations

Integrating AI into business functions requires a baseline understanding of technologies like natural language processing, machine learning, and deep learning. These systems rely on business data and use these technologies to facilitate business operations. Integrating enterprise-grade AI can help free human workforces from repetitive manual tasks, improve data analysis, business strategy and decision-making, and optimize processes organization-wide. To do so, organizations that integrate AI typically require an infrastructure that properly manages data and supports AI technology. Having a strong data governance framework helps keep data available to all relevant stakeholders and secure from data breaches. According to some research, the use of artificial intelligence in business operations has doubled since 2017, largely because AI technology can be customized to meet an organization's unique needs. (Source: www_ibm_com__c0f7a40a9c452b3a::c0001, www_ibm_com__c0f7a40a9c452b3a::c0002, www_ibm_com__c0f7a40a9c452b3a::c0003)

Some organizations are identifying existing AI-enabled business models that they can scale, and the corresponding AI capabilities a company needs to build. Researchers have identified different business model categories that incorporate AI, including supplier companies that sell products through third parties, omnichannel companies that have a digital and physical presence such as retailers and banks, modular producers that offer plug-and-play products or services, and ecosystem drivers that offer a go-to destination in a given customer domain. (Source: mitsloan_mit_edu__55f3ee2df411df14::c0001, mitsloan_mit_edu__55f3ee2df411df14::c0003)

Limits, Tradeoffs, and Risks in Business Use

One area of concern is what some experts call explainability, or the ability to be clear about what the machine learning models are doing and how they make decisions. Understanding why a model does what it does is actually a very difficult question. Systems can be fooled and undermined, or just fail on certain tasks, even

those humans can perform easily. For example, adjusting the metadata in images can confuse computers—with a few adjustments, a machine identifies a picture of a dog as an ostrich. The importance of explaining how a model is working and its accuracy can vary depending on how it's being used. While most well-posed problems can be solved through machine learning, some experts suggest that models may only perform to about 95% of human accuracy. (Source: mitsloan_mit_edu__b85f152879c15db1::c0011)

Machines are trained by humans, and human biases can be incorporated into algorithms—if biased information, or data that reflects existing inequities, is fed to a machine learning program, the program will learn to replicate it and perpetuate forms of discrimination. In some cases, machine learning models create or exacerbate social problems. For example, some organizations have used machine learning as a tool to show users ads and content that will interest and engage them, which has led to models showing people extreme content that leads to polarization and the spread of conspiracy theories when people are shown incendiary, partisan, or inaccurate content. (Source: mitsloan_mit_edu__b85f152879c15db1::c0012)

Building and maintaining AI systems is not simple. The underlying models change quickly, and tools that work today may need reworking weeks later. That reality is shaping how organizations think about vendors. Some retailers are spreading risk across vendors rather than relying on a single provider. While more complex AI applications can be useful for the right organization, they require the necessary resources to create and effectively use the tools. Otherwise, the project could end up being a net negative. (Source: www_artificialintelligence_news_com__f00bf123dd759632::c0002, www_flagler_edu__77ae53fb510874a9::c0005)