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'Hot topics and emerging trends in data science'

'Disruptive Technologies'

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HIGHLIGHTS

We gauged the perspectives of experts in data science, asking them about the biggest emerging trends in data science.

As one of the fastest evolving areas of tech, data science has seen a rise up the corporate agenda as less and less leaders base business decisions on guess work. With added capabilities such as artificial intelligence (AI) and the edge complementing the work of data scientists, the field is becoming more accessible to employees, but this still requires training of data skills, on the most part. In this article, we explore some key emerging trends in data science, as believed by experts in the field.

Increased involvement of AI and ML

Firstly, it's believed that the involvement of AI and machine learning (ML) will increase further, and enable more industries to become truly data-centric.

"As businesses start to see the benefits of artificial intelligence and machine learning enabled platforms, they will invest in these technologies further," said Douggie Melville-Clarke, head of data science at Duco.

"In fact, the Duco State of Reconciliation report – which surveyed 300 heads of global reconciliation utilities, including chief operating officers, heads of financial control and heads of finance transformation – found that 42% of those surveyed will investigate the use of more machine learning in 2021 for the purposes of intelligent data automation."

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Data science in insurance

Melville-Clarke went on to cite the insurance industry, often perceived as a sector that’s had difficulty innovating due to high levels of regulation, as an example for future success when it comes to data science.

He explained: “The insurance industry, for example, has already embraced automation for processes such as underwriting and quote generation. But the more valuable use of artificial intelligence and machine learning is to increase your service and market share through uses like constrained customization.

“Personalization is one of the key ways that banks and insurance companies can differentiate themselves, but without machine learning this can be a lengthy and expensive process.

“Machine learning can help these industries tailor their products to meet the individual consumers’ needs in a much more cost-effective way, bettering the customer experience and increasing customization.”

The evolution of hyperautomation

Along with rising use of AI and ML models, organizations have been combining AI with robotic process automation (RPA), to reduce operational costs through automating decision making. This trend, known as hyperautomation, is predicted to help companies to continue innovating fast in a post-COVID environment in the next few years.

“In many ways, this isn’t a new concept — the key goal of enterprise investment in data science for the past decade has been to automate decision-making processes based on AI and ML,” explained Rich Pugh, co-founder and chief data scientist at Mango Solutions, an Ascent company.

“What is new here is that hyperautomation is underpinned by an ‘RPA-first’ approach that can turbocharge process automation and drive increased collaboration across analytic and IT functions.

“Business leaders need to focus on how to harness enterprise automation and continuous intelligence to elevate the customer experience. Whether that is embedding intelligent thinking into the processes that will drive more informed decision making, such as deploying automation around pricing decisions to deliver a more efficient and personalised service, or leveraging richer real-time customer insights in conjunction with automation to execute highly relevant offers and new services at speed.

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"Embarking on the hyperautomation journey begins with achieving some realistic and measurable future outcomes. Specifically, this should include aiming for high-value processes, focusing on automation and change, and initiating a structure to gather the data that will enable future success."

SaaS and self-service

Dan Sommer, senior director at Qlik, identified software-as-a-service (SaaS) and a self-service approach among users, along with a shift in advanced analytics, as a notable emerging trend in data science.

"To those in the industry, it's clear that SaaS will be everyone's new best friend – with a greater migration of databases and applications from on premise to cloud environments," said Sommer.

"Cloud computing has helped many businesses, organizations, and schools to keep the lights on in virtual environments – and we're now going to see an enhanced focus on SaaS as hybrid operations look set to remain.

"In addition, we'll see self-service evolving to self-sufficiency when it comes to effectively using data and analytics. Empowering users to access data, insights and business logic earlier and more intuitively will enable the move from visualization self-service to data self-sufficiency in the near future.

"Finally, advanced analytics need to look different. In uncertain times, we can no longer count on backward-looking data to build a comprehensive model of the future. Instead, we need to give particular focus to, rather than exclude outliers – and this will define how we tackle threats going forward too."

Data fabric

With employees gradually becoming more comfortable with using data science tools to make decisions, while aided by automation and machine intelligence, a concept that's materialized as a hot topic for the next stage of development is the concept of 'data fabric'.

Trevor Morgan, product manager at comforted AG, explained: "A data fabric is more of an architectural overlay on top of massive enterprise data ecosystems. The data fabric unifies disparate data sources and streams across many different topologies (both on-premise and in the cloud), and provides multiple ways of accessing and working with that data for organizational personnel, and with the larger fabric as a contextual back-

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-drop.

“For large enterprises that are moving with hyper-agility while working with multiple or many Big Data environments, data fabric technology will provide the means to harness all this information and make it workable throughout the enterprise.”

New career paths and roles
Another important trend to consider regarding the future of data science is the new career paths and jobs that are set to emerge in the coming years.

“According to the World Economic Forum (WEF)’s Future of Job’s Report 2020, 94% of UK employers plan to hire new permanent staff with skills relevant to new technologies and expect existing employees to pick up new skills on the job,” said Anthony Tattersall, vice-president, enterprise, EMEA at Coursera.

“What’s more, WEF’s top emerging jobs in the UK — data scientists, AI and machine learning specialists, big data and Internet of Things — all call for skills of this nature.

“We therefore envision access to a variety of job-relevant credentials, including a path to entry-level digital jobs, will be key to reskilling at scale and accelerating economic recovery in the years ahead.”

The ‘Industrial Data Scientist’

In regards to new roles to emerge in data science, Adi Pendyala, senior director at Aspen Technology, predicts the emergence of the ‘Industrial Data Scientist’: “These scientists will be a new breed of tech-driven, data-empowered domain experts with access to more industrial data than ever before, as well as the accessible AI/ML and analytics tools needed to translate that information into actionable intelligence across the enterprise.

“Industrial data scientists will represent a new kind of crossroads between our traditional understanding of citizen data scientists and industrial domain experts: workers who possess the domain expertise of the latter but are increasingly shifting over to the data realm occupied by the former.”

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New tools

Many organizations are being impacted by a shortage of data scientists in proportion to demand, but Julien Alteirac, regional vice-president, UK&I at Snowflake, believes that new tools, powered by ML, could help to mitigate this skills gap in the near future.

“When it comes to analyzing data, most organizations employ an abundance of data analysts and a limited number of data scientists, due in large part to the limited supply and high costs associated with data scientists,” said Alteirac.

“Since analysts lack the data science expertise required to build ML models, data scientists have become a potential bottleneck for broadening the use of ML. However, new and improved ML tools which are more user-friendly are helping organizations realize the power of data science.

“Data analysts are empowered with access to powerful models without needing to manually build them. Specifically, automated machine learning (AutoML) and AI services via APIs are removing the need to manually prepare data and then build and train models. AutoML tools and AI services lower the barrier to entry for ML, so almost anyone will now be able to access and use data science without requiring an academic background.”

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Let's face it—the last coupe of years have been very challenging for all due to the COVID-19 pandemic. Despite this reality, we're still charging on into the future.

New advances in technology are still disrupting our lives—in many cases—for the best. Note that some of them are already in place, but they are still evolving and changing at a rapid pace, meaning the impact of these advances will only amplify.

What Is Disruptive Technology?

Disruptive technology is an innovation that causes major change in the way consumers, businesses and industries operate. A disruptive technology has the potential to replace the existing systems or habits through its attributes that are measurable and superior.

In simple terms disruptive technology is a new technology that significantly changes the way an existing market or industry operates. Disruptive technologies are often initially met with resistance from incumbent businesses because they threaten to upend the status quo. However, over time, they can completely transform how an industry functions. Some examples of disruptive technologies include personal computers, online shopping, and ride-sharing apps.

Potential of Disruptive Technology

The potential of disruptive technology is often underestimated. This is because the technology itself is often misunderstood. Disruptive technology is not necessarily new or groundbreaking. Rather, it is technology that has the potential to disrupt an existing market or industry. This type of technology can be found in a number of industries, from transportation to healthcare. In many cases, disruptive technology is not initially adopted by the mainstream market. This is because it is often seen as too risky or unproven. However, over time, as the technology matures, it can gain mainstream adoption. This can lead to a number of benefits, including lower prices, improved quality, and increased competition. Disruptive technology has the potential to revolutionize an industry. It can make products and services better, faster, and more affordable. In some cases, it can even create entirely new markets.

Blockchain as an Example of Disruptive Technology

While blockchain is often associated with Bitcoin and other cryptocurrencies, the technology can have much broader applications. In fact, blockchain is an example of disruptive technology, which refers to a new technology that significantly changes the way that business is conducted.

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Blockchain is a distributed database that allows for secure, transparent and tamper-proof transactions. The technology is particularly well-suited for financial transactions, but it can be used for a wide range of other applications as well.

One of the most important features of blockchain is that it is decentralized, which means that it is not controlled by any single entity. This has a number of advantages, including increased security and transparency.

Blockchain is still in its early stages of development and it remains to be seen how far the technology will spread. However, it has the potential to revolutionize a wide range of industries and we are only just beginning to see its potential applications.

Investing in Disruptive Technology

When considering an investment in a company that is developing a disruptive technology, it is important to do your research and to understand the risks involved. You should also keep in mind that these investments can be highly speculative and that there is no guarantee that the technology will be successful. With that said, investing in disruptive technology can be a great way to get in on the ground floor of an innovative new company. These investments can offer high potential rewards, but they also come with a higher degree of risk.

Examples of Disruptive Technology

While new technologies are being developed all the time, not all of them are disruptive. To be considered disruptive, a technology must meet certain criteria. First, it must be significantly different from existing technologies in the market. Second, it must be able to create a new market or significantly change an existing one. And finally, it must have the potential to displace established technologies or create new market leaders. Some specific examples of disruptive technology include:

3D Printing

While we don't yet have matter replicators like seen on Star Trek, 3D printing is a good start. With the proper equipment, software, and raw material, we can "print" various objects. This chart shows how 3D printing use is rising and where it's projected to go.

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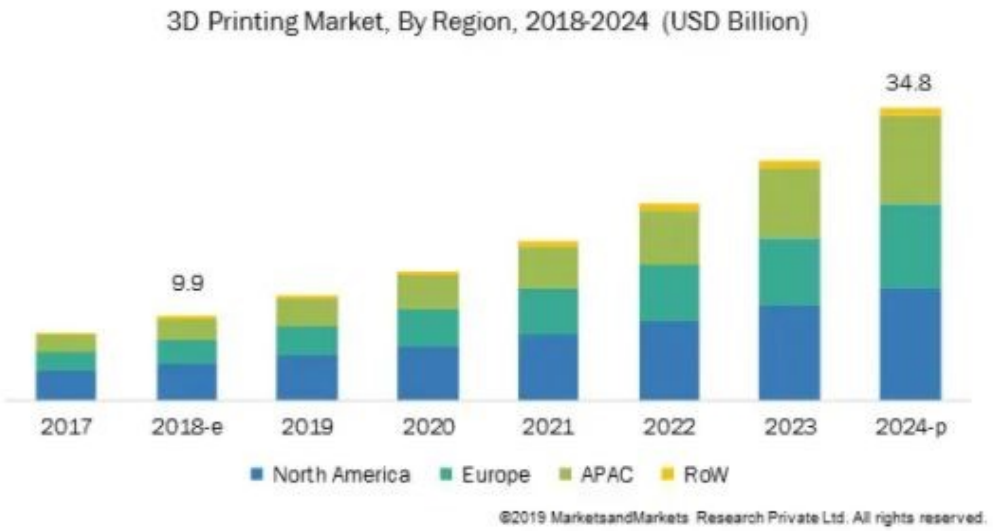

Since 3D printing lets people create what they need in-house, the technology could disrupt mass-production manufacturing and goods transportation.

5G and Improved Connectivity

Fifth-generation mobile connectivity is here, providing more incredible speed and higher quality video streaming. This increased speed will make remote working a more viable option because you have compatibility with previous versions of the protocols, higher global connectivity, more bandwidth and video capacity, tighter security controls, and more. There will be countless opportunities in this mobile networking field as it continues to grow and evolve.

Learn about Definitive Guide to 5G Technology and How It Works.

Artificial Intelligence and Machine Learning

AI is already a big part of our lives, but it hasn't reached its full potential in either capabilities or ubiquity. Although artificial intelligence is making significant inroads in the customer service industry, it still has a long way to go.

Artificial intelligence helps businesses understand the changing nature of human habits and behavior and better predict the next hot item. AI developments result in more sophisticated algorithms, aiding marketers to adapt to new markets and trends.

Thanks to these benefits, AI is a technological field that can explode into a multi-trillion dollar industry.

Artificial intelligence and machine learning contribute significantly to automation and robotics, which leads us to:

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Automation and Robotics

We've seen the rise of drones, self-driving trucks, and robots in the manufacturing sector, but this is just the beginning. There have already been gigabytes of text written about how robotics is a disruptive force in the workforce, replacing humans with cheaper, more reliable machines. It's easy to find dire predictions of massive unemployment in the wake of a machine takeover. According to this article, over 120 million workers world-wide will need to be retrained over the next few years, owing to robots and AI.

While there will undoubtedly be some attrition in the labor force, the picture isn't as bleak as the prophets of doom would have you believe. After all, greater numbers of robots and automated systems mean more professionals to program and maintain them. Those kinds of jobs pay more than simple assembly-line grunt work.

Our COVID-filled modern society and the unique demands demonstrate the potential usefulness of robots in administering care in assisted living situations, particularly for the elderly. Robots neither get sick nor spread infection, reducing risks for both the caregivers and their patients. Drones can handle contactless delivery of much-needed supplies such as medication.

Cyber Security Advances

Criminals practice their shady activities wherever people congregate, and since everyone's online these days, we have cybercriminals to contend with. Even worse, cybercriminals have exploited the coronavirus crisis to their ends.

Fortunately, there are advances in cyber security to fight those threats. Because of advances in AI and machine learning, cyber security experts design better firewalls and intrusion detection tools.

Cyber-criminals will be the ones feeling the results of advances in this disruptive technology, so that's not a bad thing.

Edge Computing

In the mainframe age, we had giant computers connected to "dumb" terminals. Eventually, this changed into the client-server model. Now, we have the cloud. As we have moved from model-to-model, a new one has emerged.

Edge computing is already one of the most disruptive technologies in IT. At a basic level, it is an automated way to get nearer to the cloud-like compute power you need, with better latency issues. It's not so much eliminating the cloud as it is bringing it closer to

you.

Edge computing offers less latency, increased security, and greater bandwidth. As edge computing takes off, it will continue to disrupt the larger cloud providers or shift more control to the companies that become more adept at implementing it.

Virtual and Augmented Reality

When a user gets placed in a computer-generated environment, that's virtual reality (VR). When the user wears a headset or glasses and has computer-generated images projected onto their field of vision, that's augmented reality (AR). Together, they comprise the field of extended reality (XR).

Fields such as healthcare and education stand to benefit significantly from VR and AR. VR can conduct medical diagnoses and examinations. Overcrowded classrooms or situations where children need to learn at home (there's that coronavirus again) can benefit from XR solutions, assuring that every student gets the education they need without risking infection from a global pandemic.

XR methods could possibly revolutionize (i.e., disrupt) currently established means of medical practice and education.

Headless Tech

No, this has nothing to do with decapitation. It describes technology that allows businesses to decouple their front-end user interface from their back-end ecommerce data solutions. If you tell your Amazon Alexa to purchase and ship you the latest Stephen King novel, you're using headless tech.

Since 86 percent of business leaders surveyed report increasingly rising customer acquisition costs, the ecommerce world needs more innovative, cost-effective solutions that attract and retain new users. Headless tech can be that potential game-changer, providing would-be customers with a more engaging, less time-consuming shopping experience.

As this trend catches on, it will upend the entire ecommerce model, with businesses scrambling to incorporate headless tech or get left behind in the dust. Could headless tech make traditional ecommerce purchasing methods obsolete?

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The Rise of "As-a-Service" Computing

This computing model has been with us for a while now. We have software-as-a-service (SaaS), infrastructure-as-a-service (IaaS), and platform-as-a-service (PaaS). These cloud-based, on-demand platforms have revolutionized the IT world. For instance, why buy a physical copy of a video game or word processing utility when you can just get access to it via a cloud subscription? Or how about Zoom, which has rocketed to worldwide popularity thanks to the pandemic?

Providers that offer scalable cloud-based solutions are riding high these days, and the cost, convenience, and reliability make cloud solutions an attractive choice. As more "as a service" options become available in more industries, people and organizations will abandon the older computing methods in favor of this far superior delivery system.

The Work-From-Home Revolution

It's funny how a worldwide pandemic has completely turned our lives upside-down and influenced our technological innovations and development. This is unsurprising, as warfare spurns more incredible technological advances, and we are arguably at war with this deadly contagion.

Businesses wanting to continue functioning during these trying times have set up infrastructure to allow better work-at-home capabilities. Advances in related technology, some of which we've already discussed, make working at home a viable, efficient option.

And it needn't be an "all or nothing" proposition. Businesses can have their employees work mostly from home but have them doing their jobs in-house one or two days a week.

If a company's employees work from home, the business has fewer infrastructure costs, making this a flexible, cost-effective strategy. The ongoing COVID-19 situation has shown how easy it is to work from home. Will more companies embrace this after the pandemic ends, citing cost-cutting measures? Are we seeing the end of the modern office space as we know it?

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