EY Disruption Index™
Are you ahead of the curve?
Q4 2018
Welcome to the EY Disruption Index™ bulletin for Q4 2018. This is the second edition of a regular publication sharing key insights on how disruptive technologies are penetrating and impacting key sectors.

Advances in technology have been disrupting business models for centuries. In our lifetime, successive waves of IT revolution (PC, online, mobile, social, etc.) have democritised data, empowered consumers and spawned scores of new sectors. Technology advancement is accelerating, and the current waves – the internet of things (IoT), virtual reality (VR), artificial intelligence (AI), robotics, blockchain, augmented reality (AR), etc. – promise to be even more revolutionary.

Our response is to help organisations navigate the technology landscape and find the opportunity in this challenge. Therefore, we have developed the EY Disruption Index™ which, each quarter, analyses more than 500,000 events across 380 subsectors, tracking the rate of change of disruptive technologies.

The EY Disruption Index™ can help you:

► Understand which technologies are impacting your sector today and their stage of adoption, and which technologies are expected to impact your sector in the future
► Benchmark your adoption of these technologies against peers in your sector
► Understand how you may need to adapt to be on the front foot with disruptive technologies

This bulletin summarises some of the emerging trends across technologies and sectors based on the results we have seen from data collected in the 14 months from December 2017 to January 2019.

As the amount of data collected increases over time, we expect to develop further, more detailed insights across emerging technologies, which will be shared in subsequent editions of these bulletins.

We hope you will enjoy reading it and we look forward to your comments and questions. If you would like to get in touch, please contact us at eydisruptionindex@uk.ey.com.
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Key findings in this edition

1. Travel and leisure is still the sector undergoing the fastest rate of change, driven by AI, the IoT and VR.

2. Oil and gas has shown the highest quarterly acceleration rate in disruptive technologies deployment across all sectors, mainly driven by AI, the IoT and robotics.

3. The most disruptive technology across all sectors remains AI, followed by blockchain, which is focused largely on financial services and the IoT.

4. AR, VR and the IoT have seen the greatest rates of acceleration across certain sectors this quarter.
Context

How we can help

The EY Disruption Index™ can help you:
► Understand which technologies are impacting your sector today and their stage of adoption, and which technologies are expected to impact your sector in the future.
► Benchmark your adoption of these technologies against peers in your sector.
► Understand how you may need to adapt to be on the front foot with disruptive technologies.

Our approach

Each quarter, we analyse more than 500,000 events across 380 subsectors, tracking the rate of change of disruptive technologies.

Disruptive technologies follow an adoption curve in each sector: slow adoption, then rapid deployment followed by decelerating maturity. These adoption rates vary for technologies in each sector. For example, blockchain is more prominent within financial services than in travel and leisure.¹ Similarly, AI is more widely used in health care than it is in construction and materials.¹

By tracking the adoption rates of technologies each quarter, we can see where a technology lies in the curve for your sector. By understanding your own adoption of the technology, you will have the insight on whether you are ahead of the curve.

Examples of S-curves² for internet connections, broadband subscriptions and electric vehicles are shown in Exhibit 1.

As new technologies emerge and commercialise, these will start to appear on the EY Disruption Index™ outputs.

Key questions to ask your business
► What are the technologies impacting your sector today and how far are you with adoption?
► Where are you in relation to your competitors?
► How do you respond?

¹ EY analysis.
² EY analysis for the UK market.
By leveraging our proprietary methodology and algorithms, we can predict the S-curve trajectory³ of a technology, which we can use to understand timings of key inflection points (i.e., A beginning of rapid deployment and B maturity phase).

Exhibit 2 below provides an illustrative example of how AI, 3D printing and blockchain are expected to evolve in the coming years across a number of sectors.

Key highlights⁴ include:
- The rapid deployment phase for AI and blockchain is expected to commence in c.2022 and c.2024 respectively.
- Widespread deployment of 3D printing is expected to commence in c.2025.
- Blockchain and AI are expected to become de facto technologies by c.2025 and by c.2028 respectively. 3D printing is expected to be a mature technology by c.2033.
- By predicting the S-curve trajectory of technologies, we can help organisations in assessing whether they need to adapt their plans to remain competitive in the future.

³ S-curve projections will be adjusted on a regular basis to reflect major macroeconomic events and technology enhancements.
⁴ This analysis is intended to be illustrative and does not refer to any specific sector.
Emerging findings

Index ratings for January 2019 – sector trends

By analysing the EY Disruption Index™ evolution across sectors, we can identify how sectors are changing from impacts of disruptive technologies. The rates of change will vary for each sector depending on the individual technology being deployed. The cumulative index rating, since the start of the index, for each sector are shown in Exhibit 3.

Index ratings – quarterly acceleration

By analysing the quarterly EY Disruption Index™ across sectors, we can identify which sector has had the greatest acceleration in embracing disruptive technologies this quarter.

Sector index trends

Exhibit 3

AI, the IoT and VR remain among the prominent technologies in the travel and leisure sector. The maturing of AI, combined with advanced data analytics, is allowing this sector to create unique offers and experiences in real time (and at scale) that appeal to the needs and desires of each individual traveller.

Hotels are also starting to use voice-activated devices (the IoT) that are connected to the internet to give customers the comfort and ability to manage their time by talking to a virtual assistant (e.g., Alexa and Siri).

Airlines and travel companies are also starting to use VR to provide potential customers with a virtual tour of a selected itinerary, experience a hotel room and ‘visit’ local attractions.

Source: EY

1Travel and leisure is still the sector undergoing the fastest rate of change, driven by AI, the IoT and VR

2Oil and gas has shown the highest quarterly acceleration rate in disruptive technologies deployment across all sectors, mainly driven by AI, the IoT and robotics

AI, the IoT and robotics are the prominent technologies helping the oil and gas sector pursue financial sustainability in an era of increasing competition from alternative energy sources, battery storage and electric vehicles.

Intelligent and connected devices (a form of IoT), combined with automation techniques, are allowing the oil and gas sector to make operations safer, more efficient and cheaper.

Increasingly sophisticated AI-based models of rocks and fluids below ground level or under the sea bed are being implemented with the objective of raising the exploration wells’ success rate from 33% to 50%. Also, the rise of cloud computing servicing is making it possible to store and analyse huge amounts of data at relatively low costs. This will help the oil and gas sector to target wells more precisely in oil-bearing rocks.

By looking at nine commercialised disruptive technologies, we can analyse their overall penetration across the market and across individual sectors.

### Disruptive technologies – quarterly penetration

<table>
<thead>
<tr>
<th>Sector</th>
<th>AI</th>
<th>Blockchain</th>
<th>IoT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autonomous vehicles</td>
<td>11.0%</td>
<td>17.3%</td>
<td>9.3%</td>
</tr>
<tr>
<td>Drones</td>
<td>3.9%</td>
<td>6.6%</td>
<td>0.9%</td>
</tr>
<tr>
<td>VR</td>
<td>0.0%</td>
<td>0.6%</td>
<td>0.9%</td>
</tr>
<tr>
<td>AR</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.6%</td>
</tr>
<tr>
<td>3D printing</td>
<td>2.2%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

Disruptive technology penetration

Since the initiation of the EY Disruption Index™, AI has continued to dominate as the most profound disruptive technology. The prominent sectors that AI has been impacting include financial services, automotive and transportation, telecommunications and retail.

The quarterly gap between blockchain and AI has increased. This is due to the trial nature of most blockchain solutions. While blockchain platforms are being developed by banks, clearing houses and payment services firms, among others, these applications mostly remain in a testing phase. Also, as expected, blockchain remains largely focused on the financial sector.

The IoT remains quite stable at third place, with c.12.4% of overall penetration. The prominent sectors that the IoT has impacted this quarter are telecommunications and automotive and transport.

### Quarterly technology acceleration

By observing the quarterly adoption of individual technologies across all sectors, we can identify which technologies have had the greatest rate of acceleration this quarter.

#### Quarterly penetration vs. rate of acceleration

VR is currently emerging as a vital marketing tool for the hospitality sector, as it allows potential customers to experience a virtual tour of a hotel room and premises, or take a look at nearby attractions. For instance, Best Western has been working with Google Street View to provide a virtual reality experience, whereby travellers can see each property’s rooms, lobbies and amenities virtually online before they even arrive at the hotel.

Smart homes and offices are increasingly equipped with IoT devices that give users the ability to control functionality by talking directly to virtual assistants. Also, IoT applications continue to accelerate in the automotive and transportation sector, reflecting the increasing number of sensors and connectivity in modern day vehicles. Subsectors in the creative economies, such as gaming, live events and video entertainment, are driving the rising demand for both VR and AR. For instance, the French Government is providing funding for AR and VR producers to co-produce content with local teams to support ‘traditional’ filmmaking.

Over time, it is expected that wider applications will also be deployed for health care, education, the military and real estate (i.e., a potential buyer could visit a property without being physically there).

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Application and what’s next

How we have recently used the EY Disruption Index™ to help clients

We helped a food retailer understand which technologies were impacting and changing the nature of customer behaviours when it comes to buying daily lunches and snacks. We started by identifying the key technologies impacting the retail sector. We then drilled down into the food and beverages subsector to get a more granular view on how technologies such as AI were being used across the retailer’s value chain: automation of ordering, robotics for sandwich-making and AI for customer menu recommendations. We defined a high-level strategy for the retailer to integrate these technologies across its value chain to future-proof the business.

We helped a PE firm with several investments across a portfolio of companies understand which assets were the most exposed to technology disruption. We used the EY Disruption Index™ to identify the key technologies impacting specific sectors and their stage of adoption. We then carried out benchmark analysis to assess our client’s assets in relation to its peers. The client is now using these insights to engage with its most risky assets to define a strategy aimed at protecting and maximising companies’ value.

Calls to action

► Future-proof your business by identifying and planning to integrate the technologies that are in the horizon.
► Identify cross-sector opportunities and understand the technology synergies between your sector and target sectors.

Contact us

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EY Disruption Index™

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