The new tech future is here. How 8 technologies are revolutionizing what’s next.

The Essential Eight
Topics for today

• Exploring the Essential Eight
• AI – Key issues and impacts
Our world is rapidly changing...

64% of CEOs believe technology will disrupt how they do business in the next 5 years.

—PwC 21st CEO Survey

Source: PwC’s 21st CEO Survey (2018)
And today’s customers and employees expect more than ever before ...
We analyzed 250+ technologies to zero in on the eight having the biggest business impact right now.
Artificial intelligence

AI is an umbrella term for “smart” technologies that are aware of and can learn from their environments to assist or augment human decision making.

In practice:

- machine learning
- recommendation engines
- chatbots
- image recognition

China and North America will see biggest AI gains by 2030

- 26.1% China
- 14.5% North America
- 11.5% Southern Europe
- 10.4% Developed Asia
- 9.9% Northern Europe
- 5.6% Africa, Oceania, & other Asian markets
- 5.4% Latin America

Source: PwC Global Artificial Intelligence Study, 2017
Augmented reality

Augmented reality (AR) is a data or information “overlay” on the physical world that uses contextualized digital information to augment the user’s real-world view.

In practice:

- data visualization
- transportation safety
- customer experience
- manufacturing operations

24% of companies will make significant investments in AR in three years; 5% think it will be the most disruptive tech to their industry.

Source: PwC 2017 Global Digital IQ Survey
Blockchain technology is a distributed shared ledger where transactions are recorded and confirmed without the need for a central authority.

In practice:

- supply chain traceability
- financial processes
- identity verification
- digital currencies

How far along are companies with blockchain?

- 14% None
- 20% Research
- 32% Development
- 7% Paused
- 15% Live
- 10% Pilot

Includes companies at any stage

Note: Numbers are rounded (sum does not equal 100 due to rounding).
Source: PwC Global Blockchain Survey, 2018
Internet of things

The Internet of things (IoT) extends network connectivity and enables a diverse range of devices to collect, process, and send back data.

In practice:

- asset tracking
- smart metering
- fleet management
- predictive maintenance

73% of companies are making IoT investments today; 47% say it will be the most important tech for cutting costs.

Source: PwC 2017 Global Digital IQ Survey

PwC Digital Services
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# Drones

Drones are devices that fly or move without the presence of a pilot and can be used to collect a wide range of data or execute tasks remotely.

## In practice:

<table>
<thead>
<tr>
<th>maintain infrastructure</th>
<th>remote delivery</th>
</tr>
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<tbody>
<tr>
<td>provide security</td>
<td>capture video</td>
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5% of businesses are making significant investments in drones today; 14% will in the next three years.

*Source: PwC 2017 Global Digital IQ Survey*
Robotics is the combination of engineering and computer science to create, design, and operate mechanical devices, i.e., robots.

In practice:

- Industrial manufacturing
- Medical procedures
- Transportation operations
- Product fulfillment

31% of businesses will make significant investments in robotics in three years;

13% say it will be the most disruptive tech to their business model within the next five years.

Source: PwC 2017 Global Digital IQ Survey
Virtual reality

Virtual Reality (VR) is a simulation of a 3-D image or complete environment where a user can interact in a seemingly realistic way.

In practice:

- marketing
- virtual tours
- training
- prototyping and design

7% of companies are making significant investments in VR today; 15% in three years.

Source: PwC 2017 Global Digital IQ Survey
3-D Printing is the process of creating a three-dimensional object by successively printing layers of materials on one another until an object is formed.

In practice:

- spare parts
- rapid prototyping
- architectural models
- complex manufacturing

Top industries making 3-D printing investments over next three years

- 35% of automotive companies
- 29% of industrial product companies
- 29% of healthcare companies

Source: PwC 2017 Global Digital IQ Survey
... so what does this mean for business today?
Investing in just one technology is no longer enough to stay ahead of the curve.

**Convergence** is where real disruption happens.
These technologies are coming together to create the **next wave** of innovation.
Embodied AI

**Defined:**
A physical IoT-enabled device embedded with AI capabilities, which can perform complex tasks locally.

**Why it matters:**
From simple cameras to sophisticated drones, embodied AI will be a key contributor to achieving the $15.7 trillion global GDP gains expected from AI, according to PwC’s Global AI Study.

Global AI chip market predicted to grow at **49%** compound annual growth rate and reach $18B by 2023.

*Market Research Future 2018 Market Report*

**EXAMPLE**
*From analyzing millions of satellite images to finding healthy plant microbiome strains, startups have raised **$500M+** to bring embodied AI to agriculture.*
AI – Focus Areas

1. Cybersecurity (44)
2. Marketing Tech (42)
3. Deep Learning & Neural Networks (40)
4. Banking, Lending & Investing (39)
5. AR/VR & Computer Vision (38)
6. Healthcare (38)
7. Virtual Assistants (37)
8. Data Science Tools (35)
9. Image & Video Analysis (35)
10. Wearables & Monitoring (33)
11. Consumer Recommendations (31)
12. Online Retail (30)
13. Financial Markets Analysis (28)
14. Industrial IoT & AgTech (28)
15. Voice & Speech Recognition (26)
16. Natural Language Processing (25)
17. Drones & Autonomous Vehicles (24)
18. Chat & Messaging Bots (23)
19. Sales Software (22)
20. Recruiting & Job Hunting (22)
21. Education & Cognition (21)
22. Developer Tools (21)
23. Business Intelligence (19)
24. Predictive Algorithms (16)
25. Digital Publishing (17)

Source: Quid
Artificial Intelligence – Key Issues & Impact
Machine Learning – In a nutshell
The Machine Learning Process
Opportunities

- Compress the data processing cycle.
- Reduce errors by replacing human actions with perfectly repeatable machine actions.
- Replace time-intensive activities with time-efficient activities (process automation), reducing labor time and costs.
- Make better predictions, for everything from predicting sales of certain goods in particular markets to predicting epidemics and natural catastrophes.
- Drive revenue and grow market share through AI initiatives.
Risks

- Unidentified human biases, data biases or algorithm biases will be imbedded in the AI technology.
- Human logic errors will be imbedded in the AI technology.
- Inadequate testing and oversight of AI results in ethically questionable results.
- AI products and services will cause harm, resulting in financial and/or reputational damage.
- Customers or other stakeholders will not accept or adopt the organization’s AI initiatives.
- Organization will be left behind by competitors if it does not invest in AI.
- Investment in AI (infrastructure, research and development, and talent acquisition) will not yield an acceptable ROI.
Apophenia - perceive connections and meaning between unrelated things
Audit’s Role

- Include AI in risk assessment and consider whether to include AI in its risk-based audit plan.
- Be actively involved in AI projects from their beginnings, providing advice and insight contributing to successful implementation.
- Provide assurance on management of risks related to the reliability of the underlying algorithms and the data on which the algorithms are based.
- Ensure the moral and ethical issues that may surround the organization’s use of AI are being addressed.
- Like the use of any other major system, proper governance structures need to be established and audit can provide assurance in this space.
These technologies are rewiring business. Whether you lead or follow, start exploring.
Thank you.