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Insights

2020 高科技、媒體與電信產業趨勢預測

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曾經的願景在今年得以實現

2020年的Deloitte高科技、電信與媒體（TMT）產業趨勢預測涵蓋了三個重要的總體趨勢：

- 個別科技將不再彼此孤立，而是變得更加的相互連結與互相仰賴，而它們所產生的影響與價值也因此顯著提升。
- TMT產業大部分的營收將來自智慧型手機、電腦、電視、企業資料中心與軟體、物聯網(我們稱之為TMT產業五大應用)
- 許多早已被預測「即將到來」的產品與服務終於將在2020年於市場上推出

這股趨勢三重奏讓我們的預測變得更加準確!

當整個產業生態系演變至由少數幾個關鍵玩家所組成的互通體系時，預測未來變得比過去更簡單一點，也使我們對做出的趨勢預測更具信心。

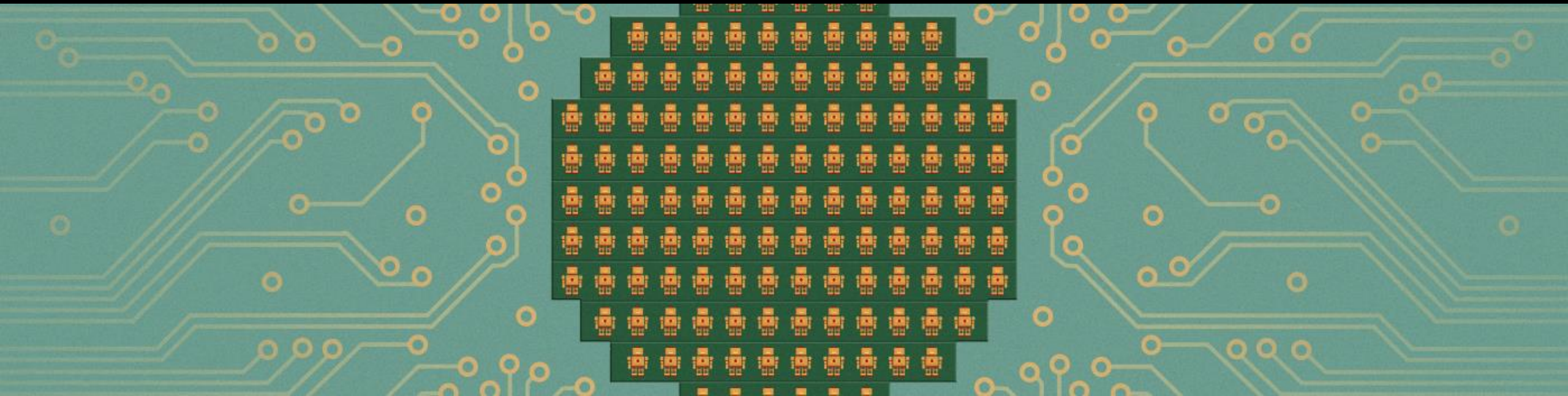
將AI帶入終端裝置：邊緣AI晶片的時代到來

定義

在設備(而不是遠端資料中心)上執行或加速機器學習任務的晶片或內含晶片的零件

我們的預測

邊緣AI運算晶片的銷售量將在2020年達到7.5億個。



將AI帶入終端裝置：邊緣AI晶片的時代到來

- 邊緣AI晶片的市場成長速度預計將是整體晶片市場成長速度的兩倍快。
- 在現階段這些晶片大部分都將使用於高端手機之中。
- 邊緣AI晶片可以整合於如手機的手持裝置，也能夠被裝配於諸如機器人/感測器/攝影機等非消費者端的裝置中，這可以歸因於：
  - 它們的體積通常比較小
  - 相比之下較不昂貴
  - 更不耗電
  - 產生的廢熱較少
- 透過在終端裝置執行運算資源吃重的任務，邊緣AI晶片將能夠減少或免除傳輸大量資料到遠端中心的需求，因此在易用性、速度、資料安全性及隱私性方面具備許多優點。
- 邊緣AI晶片最重要的長期影響在於企業端的應用。透過邊緣AI晶片，企業可將物聯網應用提升至一個全新的層次。

機器人來了：專業服務機器人將帶來雙位數成長

定義

專業服務機器人大部分使用於製造以外的領域，通常用於協助而非取代人類。

我們的預測

到了2020年，企業端的機器人銷售量預計達100萬台，其中有超過一半是專業服務機器人，創造超過160億美元的營收，相較2019年成長了30%。

機器人來了：專業服務機器人將帶來雙位數成長

- 5G網路及AI晶片的發展將促進機器人市場的成長。這兩個關鍵科技的發展將解決許多目前在實務上限制專業服務機器人的障礙，讓它們變得更符合企業買家的需求。

- 專業服務機器人的市場正由物流應用主導。在2019年，360,000個銷售入企業端的專業服務機器人中，幾乎有一半是進入物流服務公司，而第二大買家則是安檢與安防產業之企業。

- 另外兩個市場龐大且持續成長的消費性機器人產品為：1.居家清潔機器人 (掃地機器人、除草機或窗戶清洗機等) 及娛樂機器人。然而，隨著時間與科技演變，不同機器人種類之間的分別將變得越來越不明顯。機器人能夠做什麼事也許會比其產品名稱更加重要。

企業5G專網獨立運作

我們的預測

對大企業而言，5G專網變成一個更優先的選擇，尤其是在製造業、物流中心與港口等工業環境應用場域。

企業5G專網獨立運作

在下一階段的5G標準，也就是3GPP 16版發布之後，5G將有潛力在未來的10~20年成為在世界上佔有主導地位的區域(LANs)與廣域網路(WANs)科技之一。

Deloitte全球預測到了2020年，5G專網大部分將由大型企業建置及使用。到了2020年底，全球將有超過100家公司開始在工業用場域中測試完整或虛擬5G網路。在未來幾年，成千上萬家公司有可能將佈建私用的蜂巢狀網路以輔助或取代既有的區域(LANs)或廣域網路(WANs)。

5G專網將提供比其他網路標準更優秀的效能：

- 與公用網路不同，私人5G專網可以依照各場域的特殊需求進行配置，並且配置可以依據場域不同而異。
- 透過5G專網，企業可以決定不同時點的網路覆蓋範圍與品質。
- 安全性/隱私性/彈性也會變得更高。
- 特用5G網路可以被設置在臨時性的地點，例如建築工地、拍攝現場、音樂節等等。

來自低軌道的高速：寬頻網路革命還是太空垃圾?

我們的預測

到了2020年底，將有超過700個低地面軌道(low-earth orbit)衛星嘗試提供全球寬頻網路服務，而2019年底時這樣的衛星僅有200個。

來自低軌道的高速：寬頻網路革命還是太空垃圾?

寬頻網路衛星群與巨型寬頻網路衛星群所帶來的最大影響，或許是帶給全世界眾多沒辦法接觸網路或是受苦於遲鈍網速的民眾一個低延遲與高速的網路連結。

3個主要驅動力正在幫助今天的衛星寬頻產業參與者：

- 進入軌道的成本變得不再那麼昂貴
- 衛星本身與製造衛星的方法正變得更加先進
- 聯網的需求在全世界的每個角落都在成長

顧慮：將上千個新物件帶入低地軌道將會讓現有的軌道變的擁擠，並創造一個存在潛在風險的環境。

考量：太空工程很困難，但是隨著越來越多衛星建置完成，可望為現有的市場帶來改變並引進新的服務。營運商也許將面對爭執與挑戰，同時也得處理來自不同國家的法律問題。

智慧型手機新經濟：邁向兆元美金商機

定義

由全世界數十億智慧型手機擁有者所衍生出的產品與服務 (如應用程式、行動廣告、周邊硬體)

我們的預測

在2020年，智慧型手機新經濟將驅動4,590億美元的營收，幾乎與智慧型手機的銷售額相當。直到2023年為止，這個市場將以每年5~10%的速度成長。到2023年時，或許這個市場的大小已經超過智慧型手機了。

智慧型手機新經濟：邁向兆元美金商機

到了2020年，智慧型手機衍生出的新經濟中，三個最主要的組成為行動廣告、應用程式(遊戲居多)、硬體配件(例如耳機、電池、機殼等)。

- 行動廣告，將以1,760億美元的營業額成為智慧型手機新經濟中最賺錢的業務。而且隨著新型態的智慧型手機廣告出現，這塊業務將持續強勁成長。
- 應用程式(App)是這塊市場的第二大業務。App被預期將在2020年產生1,180億美元的收益，其中大部分是由遊戲應用產生。
- 排名第三的是硬體配件，收益預期為770億美元。這個數字甚至是平板、穿戴式裝置與智慧音箱預期銷售總和的好幾倍。

無線電視令人驚訝的韌性

我們的預測

到了2020年，全世界至少有16億人口、4.5億家戶，仍會持續從無線電視收看部分的電視節目。這個觀眾數字很有可能甚至會接近20億人。

無線電視令人驚訝的韌性

- 無線電視驚人的韌性顯示了全世界仍有大約20億觀眾願意透過觀看商業廣告換取免費的電視服務。
- 在傳統電視產業面臨挑戰的同時，這個發現無疑是個亮點。
  - 在美國這個重要的市場，我們預測付費電視的訂閱人數到了2020年將減少500萬人。
- 然而在國際市場上，全世界四分之三的付費電視營運商很有可能在2018~2024年之間持續擁有訂閱數成長，而這些營運商之中有三分之二的業者將會在同期觀察到自身的營收出現成長。
- 儘管電視產業的成長速度不如20年前一般快速，但整體產業並沒有崩毀，廣告商與節目頻道商有必要根據這些資訊重新規劃企業策略。

尋找你的內容傳遞網路（CDN）：影片、遊戲、以及更多令人驚豔的精彩內容

定義

內容傳遞網路(Content delivery networks, CDNs)的目的是透過讓內容更接近使用者，來提高媒體品質、速度與可靠性。

我們的預測

全球傳遞交付網路市場在2020年將達到140億美金，比2019年成長25%，到了2025年這個市場的總價值還將再翻倍。

尋找你的內容傳遞網路（CDN）：影片、遊戲、以及更多令人驚豔的精彩內容

- CDN的成長主要來自於消費者對於線上串流影音日益增加的需求。實況轉播及線上串流遊戲的出現也許將進一步推動這個市場的成長。
- 到了2022年，CDN預期將會承擔總網路流量的72%。除了現有的CDN業者之外，也會有越來越多的媒體與電信公司開始發展自己的內容傳遞網路。
- 持續成長的線上影音需求預期將會繼續推動CDN市場的持續成長。
- 線上串流遊戲更加豐富且更加動態的互動性內容將會使它成為CDN的下一個重大挑戰。
- 所有相關需求的成長都顯示CDN將在近期內迎來強勁的成長。

廣告贊助的影音服務：美國會跟著亞洲的腳步嗎?

我們的預測

在2020年，廣告贊助影音服務所產生的收入預期將達到320億美元。其中，亞洲(包含中國與印度)將以155億美元的收入領導市場，這幾乎是全球市場總值的一半。

廣告贊助的影音服務: 美國會跟著亞洲的腳步嗎?

在亞洲，超過10億人正在觀看由廣告贊助的影片點播服務(ADOV)，這個市場的蓬勃受益於以下幾個關鍵因素的出現：
可負擔的4G網路、低成本的智慧型手機、以及允許消費者用「觀看廣告」來交換免費(或便宜的)電視節目、電影與體育比賽的商業模式。

- 在中國，智慧型手機於2019年超越電視成為人們的主要娛樂裝置，其中一部份原因就是廣告支持影音服務的風行。
- 印度的付費電視相當便宜，在有些邦，將近90%的家戶至少擁有一台電視。然而電視的整體滲透率仍低於70%。透過將重心轉移至手機用戶，廣告贊助的影音服務已經將電視呈現在成千上萬使用者的手中，並帶給部分使用者人生中第一次的影音娛樂體驗。

在美國，市場則呈現相反的趨勢，多數的B2C影音服務都在追求無廣告的訂閱制商業模式。

然而，Deloitte發現美國的消費者已經越來越願意用「觀看廣告」來交換免費內容，廣告支持影音有望快速成長。

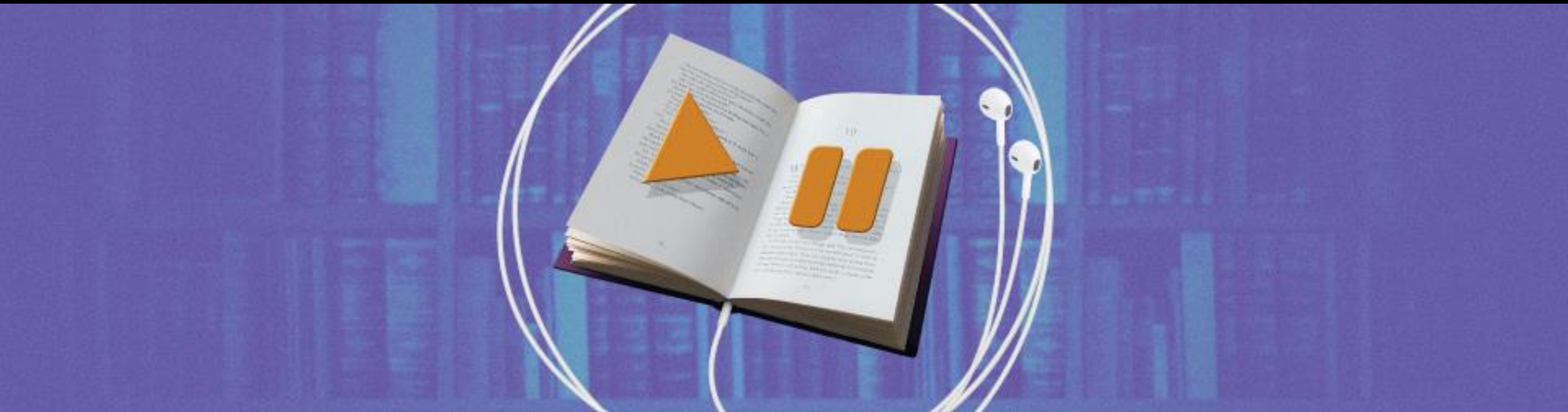
諸如Hulu、Roku、Pluto TV這類近期蓬勃發展的廣告贊助影音服務就是這個現象的證明。

廣告贊助的影音服務可能是成功影響美國市場的最新亞洲商業模式之一。

讓耳朵來：有聲書與Podcast的興起

我們的預測

全球有聲書的市場在2020年將成長25%，達到50億美金。我們同時也預測Podcast的市場將在2020年首次超越10億美金的門檻，達到11億美金，相比2019年成長30%。



讓耳朵來：有聲書與Podcast的興起

- 我們預期有聲書的市場將長期呈現雙位數的成長。
- 美國是全世界有聲書的最大市場，中國則尾隨其後成為第二大市場。
- 有聲書的銷售狀況在不同地理區域與人口群體間預期將有相當大的差異。舉例來說，通勤時間較長的國家也許會有比較高的有聲書市場成長率。.
- 依照目前的市場成長率，有聲書的銷售將有望在2023年左右超越電子書。
- 如果未來Podcast的市場成長率能夠維持過去幾年的高水準，到了2025年也許就會成為市場總值超過33億美元的大事業。然而，要讓這個願景成真，Podcast產業必須持續拓展全球市場、增加新的聽眾族群，並嘗試利用其廣大的聽眾群創造更多收入。

自行車的科技轉型：讓自行車更快、更簡單、更安全

我們的預測

到了2023年，全球電動自行車的數量將超過3億台，比2019年成長了50%。

自行車的科技轉型：讓自行車更快、更簡單、更安全

得益於預測分析、產品與應用設計、無線連網能力、數位都市規劃工具及電動化等科技上的革新，騎自行車正變得越來越流行。這些革新正在讓自行車活動變得更加吸引人：更安全、更快、更方便、更容易追蹤與監測。

使用電池(其中越來越多由鉛酸電池轉為鋰電池)來輔助動力的電動自行車，最有潛力推動自行車的市場成長。把電池融入自行車之中將開啟數個新要素的發展：自行車將不再需要圍繞重量的最佳化做設計。自行車可以蛻變為設計用於載送家人、做最後一哩運送(Last-mile delivery)、或是單純可以讓更多人在路上通行。同時，電動化應該也會讓自行車共享變得更加吸引人。

除了電動化之外，其他能夠改善自行車經驗的科技包含：

- 能夠幫助騎自行車的人規劃路線、預測抵達時間、定位共享自行車、避免路障、分享資訊的智慧手機App。
- 穿戴式氣囊、自動的轉向指示燈、以及改善的頭盔技術將會增加行車的安全性。
- 資料與分析將幫助都市設計師將都市重新設計為更加單車友善的場所。

科技產業在鼓勵自行車的使用上扮演重要的角色，幫助社會面對全球持續都市化所帶來的挑戰。

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TMT Predictions 2020

December 2019

TMT Predictions 2020

The promise of innovation becomes reality

Deloitte’s 2020 TMT Predictions report contains three overarching themes:

- Individual technologies are no longer siloed, but are becoming ever more connected and interdependent—and their impact and value are increasing as a result.
- Most of the TMT industry’s money is coming from smartphones, computers, TVs, enterprise data centers and software, and IoT (we call these the “Big Five”).
- Many services and products that have been “just around the corner” for years are finally turning that corner in 2020.

This trio of trends may make predicting more predictable! An interconnected ecosystem with a limited number of significant players should allow us to foresee trends with greater accuracy and more confidence. Indeed, it may be time to retire the old joke: “It's tough to make predictions, especially about the future.”

In the near future, maybe it won’t be as tough.

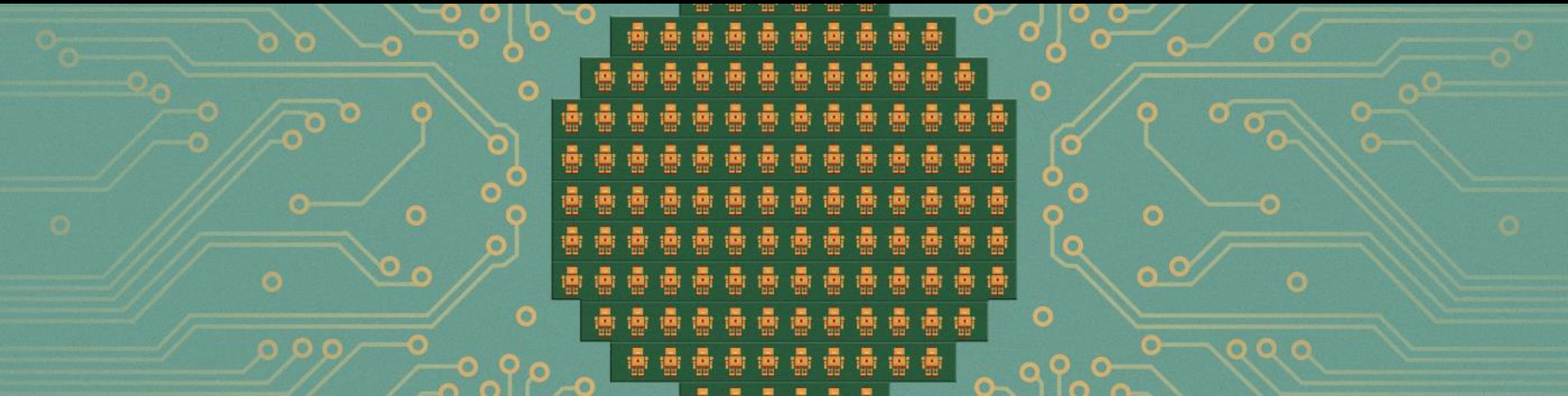
Bringing AI to the device: Edge AI chips come into their own

What are they

Chips or parts of chips that perform or accelerate machine learning tasks on-device, rather than in a remote data center.

Prediction

In 2020, more than 750 million edge AI chips will be sold.



Bringing AI to the device: Edge AI chips come into their own

- The market for these chips will likely grow twice as fast as the overall chip market.
- Most of them will go into high-end smartphones for now.
- They can be integrated into handheld devices such as smartphones and non-consumer devices such as robots/sensors/cameras because:
  - They are physically smaller
  - Relatively inexpensive
  - Use much less power
  - Generate much less heat
- By enabling these devices to perform processor-intensive AI computations locally, edge AI chips reduce or eliminate the need to send large amounts of data to a remote location—thereby delivering benefits in usability, speed, and data security and privacy.
- Their greatest long-term impact may come from their use in enterprise, where they can enable companies to take their internet-of-things (IoT) applications to a whole new level.

Robots on the move: Professional service robots set for double-digit growth

What are they

Professional service robots are mainly used outside of manufacturing, and usually assist humans rather than replace them.

Prediction

Of the ~1 million robots likely to be sold for enterprise use in 2020, just over half will be professional service robots, generating more than US$16 billion in revenue—30 percent over 2019 revenue.

Robots on the move: Professional service robots set for double-digit growth

- This market will be fueled by new developments in 5G telecom services and artificial intelligence (AI) chips. These developments can solve many challenges that currently limit professional service robots' practicality, making them more useful to enterprise buyers.

- The professional service robot sector is dominated by logistics. Just under half of the roughly 360,000 professional service robots sold to enterprises in 2019 went to logistics companies, with inspection and defense companies the next largest buyers.

- There are two additional large and growing consumer robot markets: consumer service (for tasks such as vacuuming, lawn mowing, and washing windows) and entertainment. As time goes on, however, the distinction between robot types is becoming less clear. What a machine is called may be less important than what it can do.

Private 5G networks: Enterprise untethered

Prediction

Private 5G will likely become a preferred choice, especially for industrial environments such as manufacturing plants, logistics centers, and ports.

Private 5G networks: Enterprise untethered

With the next phase of the 5G standard, known as 3GPP Release 16, 5G has the potential over the next 10 to 20 years to become one of the world's predominant LAN and WAN technologies.

Deloitte Global expects in 2020, it will be mostly the largest companies that deploy private 5G. By year-end more than 100 companies worldwide will have begun testing wholly or virtual private 5G deployments in industrial environments. Over the course of the 2020s, hundreds of thousands further companies are likely to deploy private cellular networks to complement or replace existing LANS and WANs.

Private 5G promises superior performance over other wireless standards:

- Unlike a public network, a private 5G network can be configured to a location's specific needs, and configurations can vary by site.
- With a private 5G network, the company can determine the timing of network coverage and quality.
- Security/privacy/resiliency can also be higher.
- Ad hoc private 5G networks can be set up at temporary locations such as: construction sites, filming sites, music festivals.

High speed from low orbit: A broadband revolution or a bunch of space junk?

Prediction

By the end of 2020, there will be more than 700 satellites in low-earth orbit (LEO) seeking to offer global broadband internet, up from roughly 200 at the end of 2019.

High speed from low orbit: A broadband revolution or a bunch of space junk?

The biggest impact of satellite broadband constellations and mega-constellations can be to bring low-latency, high-speed connectivity to the multitudes around the world who don't have access to the internet or suffer sluggish speeds.

Three main drivers are helping today's satellite broadband players:

- Getting into orbit has become less expensive.
- Satellites and their manufacturing methods are becoming more advanced
- The demand for connectivity has increased in every part of the world

Concerns: Introducing thousands of new objects into LEO will crowd existing orbits and create a potentially dangerous environment.

Considerations: Space is hard, but as more and more satellites are deployed, existing markets could be disrupted and new services introduced. There will be disagreements and challenges among operators to contend with, as well as regulatory issues in different countries.

The smartphone multiplier: Toward a trillion-dollar economy

What are they Products and services that depend on the billions of smartphone owners in the world.

Prediction

The smartphone multiplier will drive US$459 billion of revenue in 2020 alone, which is close to the value of smartphone sales. That market will likely grow at between 5 to 10 percent annually through 2023. By this point, the multiplier may be larger than the smartphone device market.

The smartphone multiplier: Toward a trillion-dollar economy

In 2020, the three largest elements of the smartphone multiplier will likely be mobile advertising, apps (mostly games), and hardware accessories (such as headphones, batteries, and cases).

- Mobile advertising, at $176 billion, is the smartphone multiplier’s top moneymaker. It will continue to grow strongly, with new smartphone ad formats likely.
- Apps are the second-largest component of the market. They are expected to generate US$118 billion in 2020, with game apps making the most money by far.
- Accessories are third. At $77 billion, this element is multiples of the forecast revenues for tablets, wearables or smart speakers.

My antennae are tingling: Terrestrial TV’s surprising staying power

Prediction

In 2020, at least 1.6 billion people worldwide, representing 450 million households, will get at least some of their TV from an antenna. It is possible that number may even be as high as 2 billion.

My antennae are tingling: Terrestrial TV’s surprising staying power

- Antenna TV’s resilience shows that up to two billion viewers worldwide are willing to watch some commercials in exchange for free TV.
- This is a bright spot in the overall TV landscape, as the traditional TV industry faces challenges.
  - In the important US market, we predict the number of pay TV subscribers will decline by 5 million in 2020.
- Globally, however, three-quarters of the world’s pay TV operators will likely gain subscriptions between 2018 and 2024, and two-thirds will see their revenues increase over that same period.
- While TV isn’t growing at the rate it did 20 years ago, it is also not collapsing, and both advertisers and broadcasters need to think of it in those terms.

Coming to a CDN near you: Videos, games, and much, much more

What are they

Content delivery networks (CDNs) are designed to improve media quality, speed, and reliability by bringing content physically closer to the user.

Prediction

The global CDN market will reach US$14 billion in 2020, up more than 25 percent from 2019, and the market will more than double by 2025.

Coming to a CDN near you: Videos, games, and much, much more

- This growth is being driven primarily by increasing consumer hunger for streaming video over the internet. Live video streaming and the emergence of streaming video games may further spur growth.
- By 2022, CDNs are expected to carry 72 percent of all internet traffic. In addition to existing CDN providers, a growing number of media and telecom companies are developing CDNs.
- The rising demand for video over the internet will likely continue to drive growth for the CDN market.
- Streaming video games will be the next big challenge, with their richer and more dynamic interactive content.
- All this rising demand means that in the near term, the CDN market is poised for strong growth.

Ad-supported video: Will the United States follow Asia’s lead?

Prediction

Revenue from ad-supported video services will reach an estimated US$32 billion in 2020. Asia (including China and India) will lead with US$15.5 billion in revenue in 2020, nearly half of the global total.

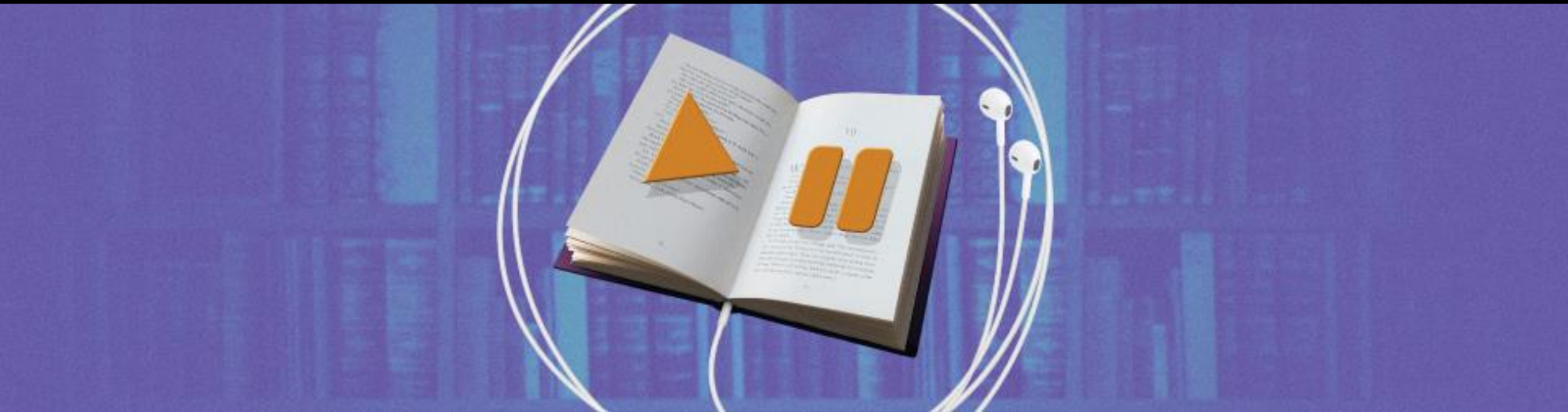
Ad-supported video: Will the United States follow Asia's lead?

- Over a billion people in Asia watch ad-supported video services thanks to the advent of affordable 4G connectivity, low-cost smartphones, and business models that allows consumers to exchange their attention for free (or low cost) TV shows, movies, and sports.
  - In China in 2019, smartphones surpassed TVs as the primary entertainment device, partly due to the popularity of ad-supported video services.
  - Pay TV in India is inexpensive, and in some states, nearly 90 percent of households have a television. But overall penetration rates remain below 70 percent. By focusing on mobile users, ad-supported video services have put TV into the hands of hundreds of millions, and given some consumers their first access to video entertainment.
- In the United States, by contrast, most direct-to-consumer video offerings are pursuing the ad-free subscription model.
- However, Deloitte has found that US consumers are increasingly willing to exchange their attention for content. Ad-supported video could grow rapidly.
- The recent growth of ad-supported video services such as Hulu, Roku, and Pluto TV are evidence of this.
- Ad-supported video could be the latest successful Asian import to the United States.

The ears have it: The rise of audiobooks and podcasting

Prediction

In 2020 the global audiobook market will grow by 25 percent to US$5 billion. We also predict that the global podcasting market will increase by 30 percent to reach US$1.1 billion in 2020, surpassing the US$1 billion mark for the first time.



The ears have it: The rise of audiobooks and podcasting

- We expect double-digit growth in audiobooks to continue in the longer term.
- The United States is the world’s largest audiobook market and China’s is second.
- Audiobook consumption will likely differ across geographies and demographics. For example, countries where commute times are longer may see higher growth rates for audiobooks.
- It is likely that at current growth rates, audiobook revenues will pass e-books by around 2023.
- Podcasts could be a US$3.3 billion-plus business by 2025 if future growth remains as high as in the past few years. For this to happen, however, the podcast industry must further expand globally, add new listeners, and get better at monetizing its large listener base.

Cycling’s technological transformation: Making bicycling faster, easier, and safer

Prediction

By 2023, the number of e-bikes globally should reach about 300 million, a 50 percent increase over 2019.

Cycling’s technological transformation: Making bicycling faster, easier, and safer

- Bike-riding is growing, thanks to technological innovations such as predictive analytics, product and application design, wireless connectivity, digital urban planning tools, and electrification. These innovations are making cycling more appealing: safer, faster, more convenient, and easier to track and measure.

- E-bikes, which use batteries (increasingly lithium ion batteries as opposed to lead acid) to assist pedaling, show the most potential to boost cycling’s growth. Adding a battery to a bike enables the development of multiple new form factors: bikes no longer need to be optimized for weight. The bicycle can morph into a vehicle designed to: carry around a family, to undertake last-mile delivery, or simply to fit more people into a lane of road. Electrification should also make bike sharing more appealing.

- Other technologies beside electrification can improve the cycling experience:
  - Smartphone apps can help bicyclists plan their routes, estimate arrival times, locate shared bikes, avoid road blockages, and share information.
  - Wearable airbags, automated turn-signaling, and improved helmet technology can increase safety.
  - Data and analytics can help urban planners redesign cities to be more bike-friendly.

- The technology industry has a large role to play in encouraging greater bicycle use, which can help society address challenges arising from continuing global urbanization.

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