Location Platform Index: Mapping and Navigation

Key vendor rankings: June 2020 update

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Summary

In brief

Omdia's Location Platform Index provides an ongoing assessment and ranking of the major vendors in the location intelligence platform and services market, with particular reference to the mapping and navigation space. The index evaluates vendors on two main criteria: the completeness of their platform and their platform's market reach. It considers the core capabilities of a location platform along with value-added services, the supporting ecosystem, and business models. The index provides a detailed analysis of all the Leaders and an assessment of the top three vendors in the Challengers segment. We also provide recommendations that will help vendors stay ahead of the game.

Omdia view

- **New parameters introduced.** This iteration of the index includes new criteria: data privacy, business intelligence, augmented reality, plus a more granular scoring system for developer reach and an adjustment for the weightings on certain categories. This has affected the scores across some parameters, as you would expect.
- **HERE is once again in pole position, widening the gap with Google .** HERE's investors and strategic partnerships are a key strength and the latest additions to the shareholder mix underscore this. New shareholders Mitsubishi Corporation (MC) and Nippon Telegraph and Telephone Corporation (NTT) open prospects in new verticals and growth opportunities in Asia Pacific.
- **Google remains in second place but has not moved the needle in a significant way.** Google continues to make incremental improvements to the Google Maps Platform with additional features and by making inroads into selected verticals. The vendor has released a revamped version of the Google Maps app but this has yet to have a big impact on consumers, based on the vendor's reported user numbers.
- **Mapbox retains third place and is set to benefit from new collaborations.** Mapbox has good reach that has been improved through recent partnerships including Yahoo! JAPAN and Hitachi Solutions. It has a smaller feature set than the top-ranked Leaders, but the platform is still maturing and with the launch of products such as Data Services, this is improving.
- **TomTom intensifies activities in autonomous driving.** TomTom is making headway on its promise to deepen its capabilities in advanced mapping and autonomous driving following the sale of its telematics business. It has formed new auto partnerships and is collaborating with Toyota Research Institute - Advanced Development (TRI-AD) and DENSO on advanced mapping projects.
- **The gap is closing between Microsoft and Apple.** These two vendors in the Challengers segment are going through a period of transition that has still not played out. Apple has released the long-awaited update of Apple Maps in the US, but this is a solid rather than spectacular revamp that has not yet been enough to alter its position. Microsoft's efforts, particularly with the enterprise-optimized Azure Maps cloud proposition, has helped increase its score and close the gap on Apple.

- **Esri and Comtech continue to perform well in their respective niches.** Esri's highly specialized product is a favorite for government work, while Comtech continues to attract telco customers and demonstrate strong public safety use cases. Both Esri and Comtech are market leaders in their chosen segments but lack the breadth of features and diverse user base needed to sit within the Leader category.

Recommendations for vendors

- **Show how location intelligence can support business and society during COVID-19**.Geolocation intelligence is an important tool in the fight against the pandemic, for example aggregated, anonymized location intelligence can be used to track the spread of COVID-19 and assess the impact of containment measures. Location solutions can help optimize deliveries at a time when demand is surging, but where lockdowns and travel restrictions make route planning extremely difficult. Vendors should flex and enhance solutions to support customers through the crisis, which will create goodwill and reputational kudos.
- **Cultivate vertical expertise as a source of strength and differentiation**. Geolocation data and solutions are critical for certain industry verticals (e.g., automotive, transportation, and logistics) and a key enabler for many others (e.g., digital advertising, retail). Specialization in industry verticals can help vendors differentiate and win competitive advantage. But this is not a pure numbers game—depth of expertise in a few core verticals is more effective than being spread thinly across too many.
- **Deepen your AI capabilities for long-term competitive advantage**. Location services and intelligence is being enhanced by AI on just about every front. Investments in in-house technology or acquisitions are one route, but also look to collaborations with other players where feasible, or industry bodies and academic institutions. Many of the big developments in AI will be driven by collaboration and co-creation.
- **Fresh opportunities for location intelligence in the consumer domain**. The deepening AI capabilities of smartphones are enabling more immersive applications and experiences that can be further enhanced by location capabilities. For example, the use of location data to enrich augmented reality (AR) shopping and gaming applications.
- **Become a data privacy champion**. Vendors that can elevate their trust credentials will be able to use this as a point of differentiation. Look to give enterprises and consumers more control over their data, whether regulations require it or not. Transparency and simplicity are key—navigating data privacy should not be a labyrinth for customers and encounters with policies and systems should be easy.

Results overview

Omdia's Location Platform Index, June 2020

The consolidated results for the latest update of Omdia's Location Platform Index are shown in **Figure 1**. The index evaluates location platform vendors on two main criteria: the completeness of their platform and its market reach. Both components play an equal role in determining the final rank of

the vendor. The index considers not only the core capabilities of a location platform but also the data and capabilities that the platform opens up to developers and the wider location community. The index provides an overview of the market and assesses the relative strengths and weaknesses of the major players.

Figure 1: Consolidated vendor ranking

	Rank	Player	Score June 2020
Leaders	1	HERE	7.49
	2	Google	7.37
	3	Mapbox	6.28
	4	TomTom	6.24
Challengers	5	Apple	5.03
	6	Microsoft	4.79
	7	Esri	4.15
	8	Comtech	4.09
Ones to Watch	9	Telenav	3.33
	10	Garmin	3.15
	11	AND	2.21
	12	Magellan	2.51

Source: Omdia

Reach and completeness

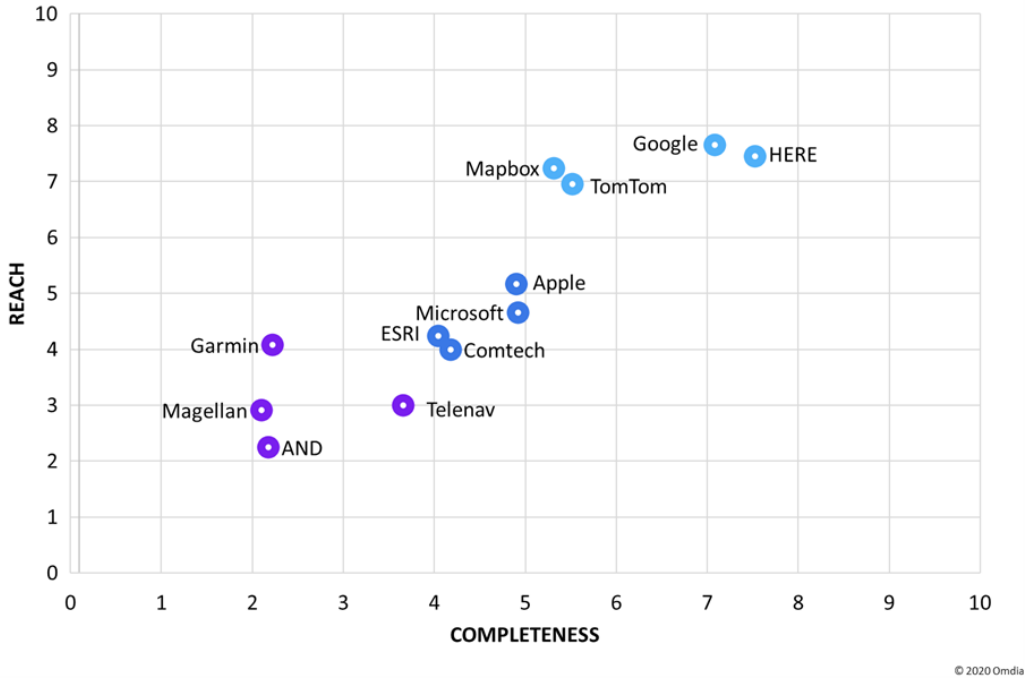
The index is based on two primary components: reach and completeness of the location platform.

- **Reach** considers two main categories:
  - **Users:** This considers the geographic markets covered by the platform; the scope of B2C, B2B2C, and B2B customers; auto OEM customers; and vertical industries served.
  - **Ecosystem:** This looks at the industry partnerships, geographic partnerships, developer base, and the developer framework to assess the attractiveness of the platform to businesses.
- **Completeness** reflects four categories:
  - **Core data:** This assesses core mapping data, data partnerships, data exchanges, and crowdsourcing capabilities.
  - **Mapping & platform:** This analyzes the depth of map coverage, AI capabilities, analytics, mapping capabilities, traffic information, and the ability to add further mapping capabilities.

- **Value-added services (VAS):** This looks at the non-core elements of a platform, which are becoming increasingly important and enhance the overall proposition. This considers ADAS and automated driving capabilities, integration with payment services, support for digital assistants, mobility services, and capability for increasing VAS.
- **Monetization:** This score assesses the ability of the platform to monetize the platform and data it has.

Figure 2 maps all the players included in the index based on their reach and completeness scores. Leaders (shown in light blue) are those vendors with an overall score of 6 and above. They are positioned in the top-right quadrant of the chart. Challengers (shown in dark blue) are vendors with an overall score between 4 and 6. Vendors in the Ones to Watch segment (shown in purple) are grouped in the lower-left quadrant and have a total score of less than 4.

Figure 2: Reach and Completeness break-out



Source: Omdia

Leaders

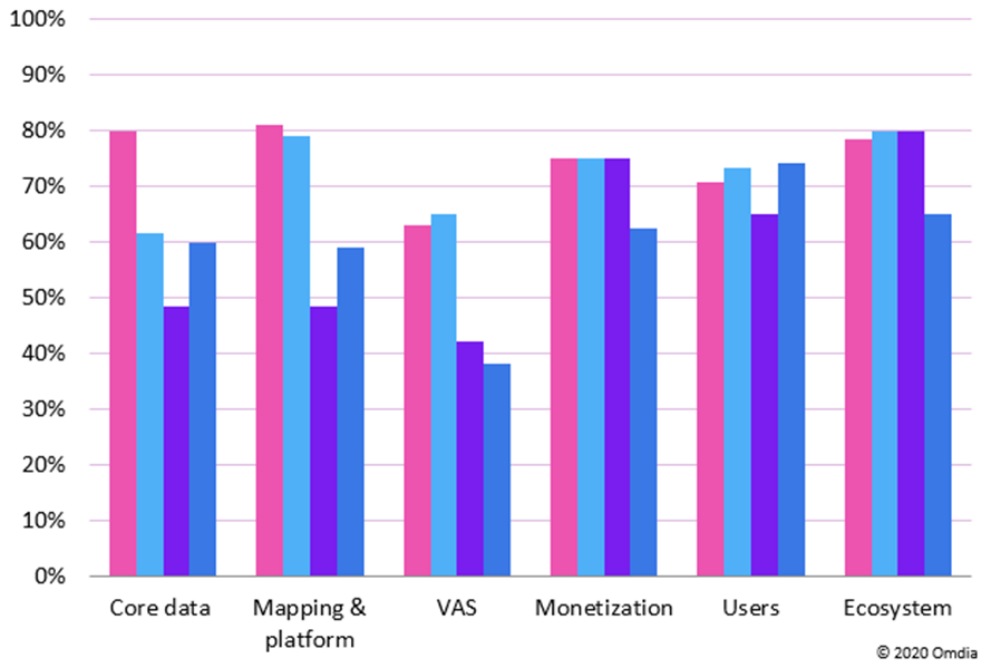
Summary

The Leader group consists of four companies: HERE, Google, Mapbox, and TomTom. **Figure 3** shows their overall score for reach and completeness as well as their scores against the four criteria for how completeness is measured: core data, mapping & platform capabilities, VAS supported by the platform, and strength of a vendor's monetization strategy. HERE and Google are longtime leaders in the location platform space, and competition between them remains intense. HERE is still ahead of Google in terms of the completeness of its offering and is closing the gap with Google in terms of

reach, thanks to an extended developer network and an impressive network of partnerships, particularly those in Asia.

Figure 3: Leaders' scoreboard

	HERE	Google	Mapbox	TomTom
Total	**7.49**	**7.37**	**6.28**	**6.24**
Completeness	3.76	3.54	2.65	2.76
Reach	3.73	3.83	3.63	3.48



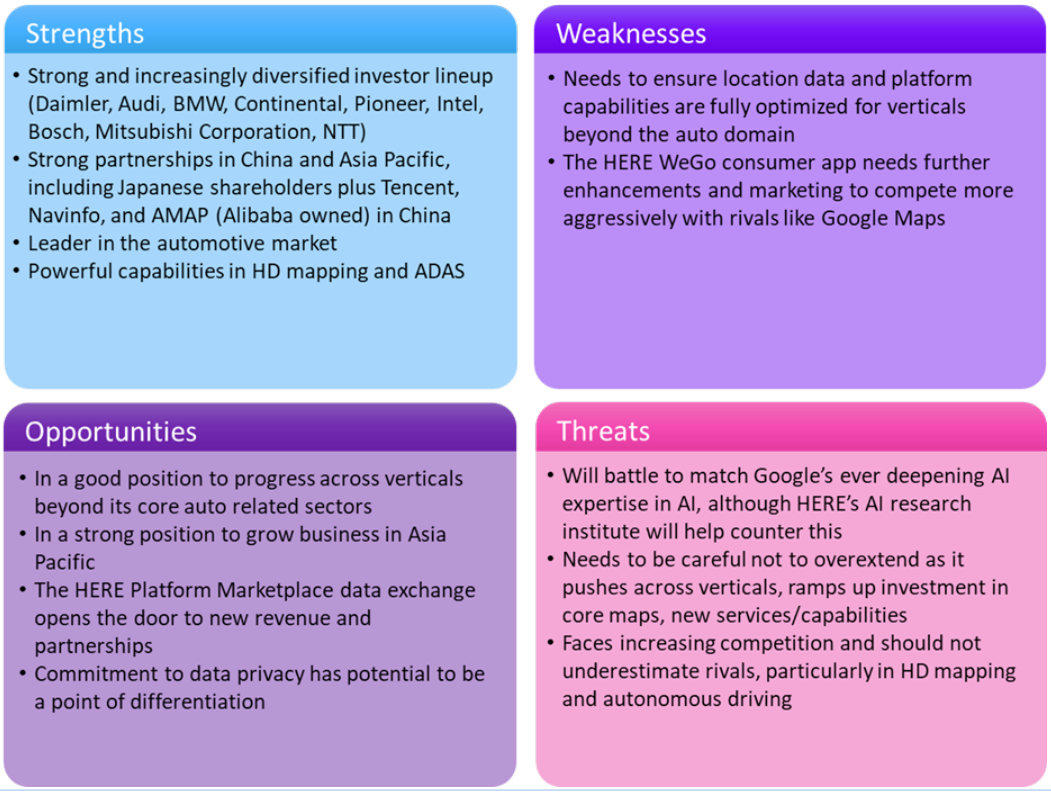
Source: Omdia

HERE

HERE is once again the highest-ranking vendor in the index with an overall score of 7.49—and has managed to widen its lead over Google. HERE is known for its powerful position in the automotive industry (as flagged in **Figure 4**), which is helped by its lineup of leading, high-profile auto OEM investors and the prowess of HERE in HD mapping and ADAS. What is perhaps less conspicuous is the progress HERE is making in other verticals, of which the priority focuses are: automotive and industrial, transport and logistics, telco and utilities, retail and media, and public sector. For example, recent enhancements for transport and logistics include the HERE Last Mile solution and related to this, a partnership with Glympse to offer joint solutions that support last mile delivery use cases for retailers, quick-serve restaurants, and insurance providers. In February 2020, the vendor introduced HERE Geodata Models that will help telcos with 5G network deployments. HERE Geodata Models is a precise 3D digital representation of the buildings, trees, and roadside objects that enables mobile network operators to better plan where to locate 5G antennas for optimal signal coverage. HERE is also addressing adjacencies to these core verticals such mobility services, city planning, and audience insights (among other things). The last 12 months has seen HERE introduce a good range of products

and capabilities in these adjacent markets, for example, with the addition of Intermodal routing for Mobility Services, or Urban Mobility as HERE prefers to call it.

Figure 4: HERE SWOT



Source: Omdia

Selected developments

- The company has released a version of its HERE WeGo consumer app optimized to help SMEs with deliveries during COVID-19, managed via an online planning dashboard. HERE WeGo Deliver is free to all SMEs until 2021. In parallel with this, HERE in partnership with Enel X has released the City Analytics – Mobility Map solution that is being used by the Italian government to assess COVID-19 containment measures.
- New Japanese investors Mitsubishi Corporation (MC) and Nippon Telegraph and Telephone Corporation (NTT) further broaden HERE's shareholder structure beyond its auto stronghold and strengthen HERE's prospects in the Asia Pacific region.
- HERE makes solid progress in building the HERE Platform Marketplace partner network, which at the end of 2019 had 34 signed contracts compared to 10 in the last iteration of the index.
- In January 2020, HERE and US telco Verizon joined forces to develop advanced safety and navigation systems that combine the telco's 5G network capabilities with a range of location data and APIs from the HERE Platform. There will be a strong emphasis on collision avoidance and visual positioning.
- In October 2019, HERE launched the AI-powered Live Sense SDK, which turns devices with front-facing cameras (e.g., smartphones, dashcams, vehicle cameras) into intelligent vehicle

sensors. The company is exploring use cases for HERE Live Sense SDK with several partners including Verizon.

- In February 2020, HERE formed a partnership with Cerence, a specialist in advanced AI-powered assistant offerings for the automotive industry. Under the agreement, HERE's location APIs will be integrated with the Cerence Drive solution, which will bring in-vehicle voice control to HERE maps, including Points of Interest (POIs) (e.g., fuel stations, parking, electric vehicle charging) and weather information.

Selected highlights

MC and NTT open new growth opportunities in Asia Pacific

In December 2020, Japanese firms MC and NTT announced plans to jointly acquire a 30% stake in HERE. This is of high strategic importance for the company as it helps further diversify a predominantly auto OEM shareholder base, which in turn should help HERE with more opportunities beyond automotive markets. The existing non-auto shareholders of HERE are Intel, Continental, Bosch, Intel, and Japan's Pioneer Corp. NTT and MC will help HERE accelerate growth in Asia Pacific, with initiatives to this effect already being planned with MC. These include deploying HERE technology in transportation and logistics use cases and for location-based advertising in airports and entertainment facilities. Another aspect of the collaboration will see MC leverage HERE location intelligence to support digitalization initiatives across sectors in which the diversified Japanese company has interests (e.g., industrial infrastructure, urban development, chemicals).

The HERE Platform Marketplace gains steady traction

The HERE Platform Marketplace (launched in 1Q19) is a global hub for the exchange of standardized, trusted location data in a secure environment. The marketplace, which is now a core component of the HERE Platform, was created to help speed up the development (and monetization) of location services and solutions. The marketplace provides access to data from HERE and third parties that the company says includes hundreds of data signals packaged into over 50 datasets spanning a variety of data sources and use cases. In January 2020, HERE expanded the functionality of the marketplace with the addition of neutral server capabilities, which enables secure access to vehicle sensor data using blockchain-based consent management. HERE is steadily building the partner network for the marketplace, reporting 35 contracts at the end of 2019 that include a mix of data providers and data consumers. The partner network includes BMW, Daimler, DKV Mobility Services, AccuWeather, and Global Weather Corp. The data and partner mix of the marketplace is still auto-centric, and we think HERE should look to strengthen the appeal and reach of the product with data assets from other domains.

HERE Cerence partnerships paves the way for advanced voice assistance

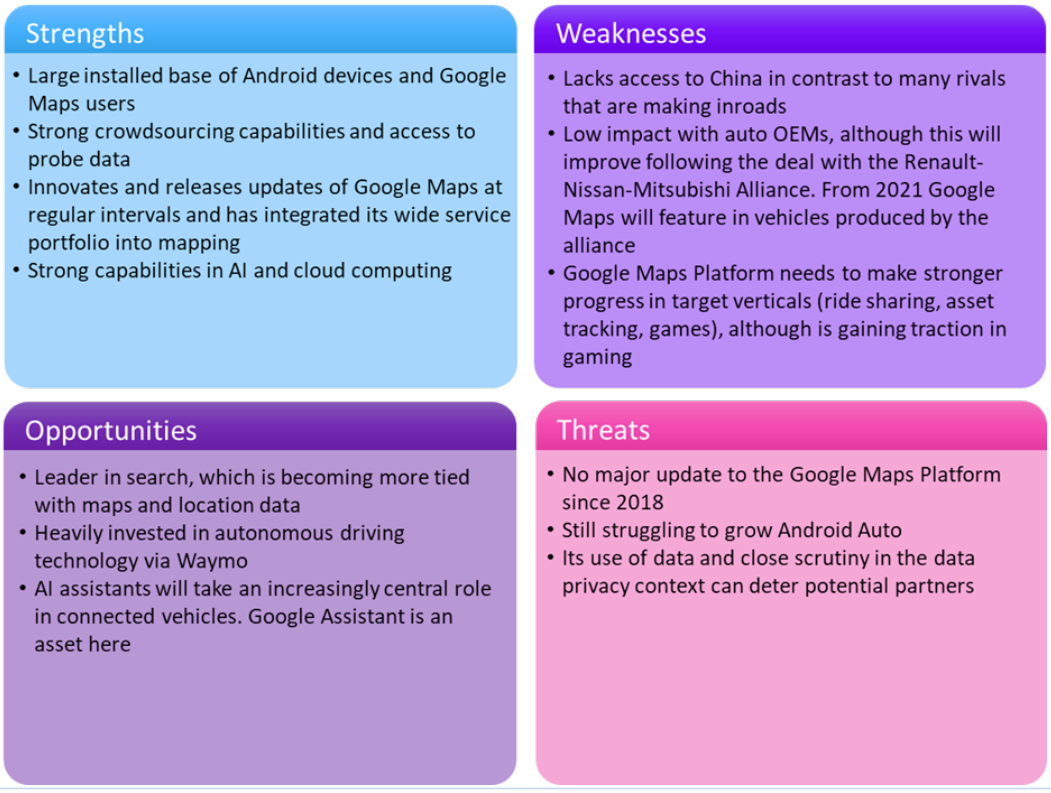
The AI-powered voice interface is becoming a key means by which consumers engage with services and control functions, typically mediated by a digital assistant. Omdia's *2019 Digital Consumer Insights* survey shows that voice control is now the main way that users access a wide range of services, to the point where voice has completely displaced or significantly reduced other forms of control. This is proving the case for music, communications, accessing news, and web browsing. The voice interface assumes even greater importance in connected cars because of its ability to improve safety, alongside utility benefits and opportunities for enhanced personalized. This is the context for HERE Cerence partnership, which also gives auto OEMs an alternative to the big consumer tech voice assistants and opportunities to create a more tailored experience for their brands. For example,

location intelligence from HERE can provide contextual insights into driver habits that enables the Cerence Drive solution to provide more accurate recommendations. The agreement also involves the integration of HERE 3D maps with Cerence Drive, which, among other things, will enable drivers to interact with POIs outside the vehicle using eye tracking and voice recognition.

Google

Google remains in second place with an overall score of 7.37. The company has been making incremental improvements to its core Google Maps Platform with additional features and by pushing into selected verticals. The last major overhaul of the platform was in 2018, which was accompanied by a new pricing model for Google Maps APIs. There has been more visible, recent change in the company's consumer-facing Google Maps application, with an updated version released in February 2020. Maintaining consumer traction is important for Google as one of its major strengths is the huge size of the Google Maps consumer base. Google reports that it has over 1 billion monthly active users, although this figure appears to have remained static for some time.

Figure 5: Google SWOT



Source: Omdia

Selected developments

- Google offers not-for-profit organizations free credits for Google Maps Platform APIs, which will expediate the development of apps or websites that use location intelligence in the fight against COVID-19. Services must be available to the public in order to qualify.
- In October 2019, the company launched a new developer resource in the form of the Google Maps Platform channel on YouTube, with video tutorials on how to do more with the platform, associated announcements, and user case studies.

- Google continues to enhance the consumer Google Maps app with more AI-powered features and greater personalization.
- In July 2019, it introduced new Autocomplete features in the Google Maps Platform that are designed to provide more customized control and to improve the clarity of results, even when there are several similar items.
- Google continues make progress with Google Maps Platform in gaming, with additional features and an update on the number of games built using the platform.

Selected highlights

The Google Maps app is getting smarter…

In Alphabet's 2019 earnings call Google revealed it had used machine learning (ML) toadd as many buildings to Maps in 2019 as it had using all techniques in the previous decade. Google's Maps achieved this by first manually creating a data depository of common building outlines, which it then used to train ML models to recognize building edges and shapes. This ML model has proved valuable in emerging markets that often lack official street signs and house numbers, and instead use handwritten signs. ML models have been trained to recognize these handwritten building numbers and names. In Lagos, Nigeria, this has helped Google add 20,000 street names, 50,000 addresses, and 100,000 new businesses to Maps.

Visual AI figures strongly in Google Maps and in 2019, it introduced the Live View AR feature to the core mapping application. Live View combines Street View's real-world images, ML, and smartphone sensors to show surroundings with the directions overlaid in AR.

Google has particularly strong capabilities in voice AI and has applied this to services in Google Maps—and we expect to see more innovation on this front. In November 2019, it added a translator feature to Google Maps that uses text-to-speech technology to automatically detect what language a person's phone is using. In October 2019, Google introduced a more detailed and nuanced voice guidance feature for people with visual impairments.

…and more personalized

In February 2020, Google released an updated version of Google Maps to coincide with the product's 15th birthday. Most of the new features are focused on making Google Maps more interactive and personalized—a travel companion rather than a pure mapping service. This is logical as more engaging products mean better opportunities for Google to drive advertising revenue, its core business.Google has enhanced Google Maps transit features in the new update, with features such as the ability to check whether onboard security is in place on public transport, to check accessibility options, and even the temperature of rides based on previous user feedback. There is a strong emphasis on user contributions in the revamped app, such as an Updates tab that captures trending venues and similar as shared by users. Google reports that users have saved more than 6.5 billion places on Google Maps.

Improved traction for the Google Maps Platform in gaming

In 2018, Google introduced vertical solutions on the Google Maps Platform that included ridesharing, asset tracking, and gaming. Google has been quiet on the first two but appears to be making progress in gaming, which is not surprising as this is a natural fit given the rise of location-enriched gaming and the market dominance of Android smartphones. In December 2019, Google announced that 10 mobile games built with Google Maps Platform were live, with 9 million daily active users

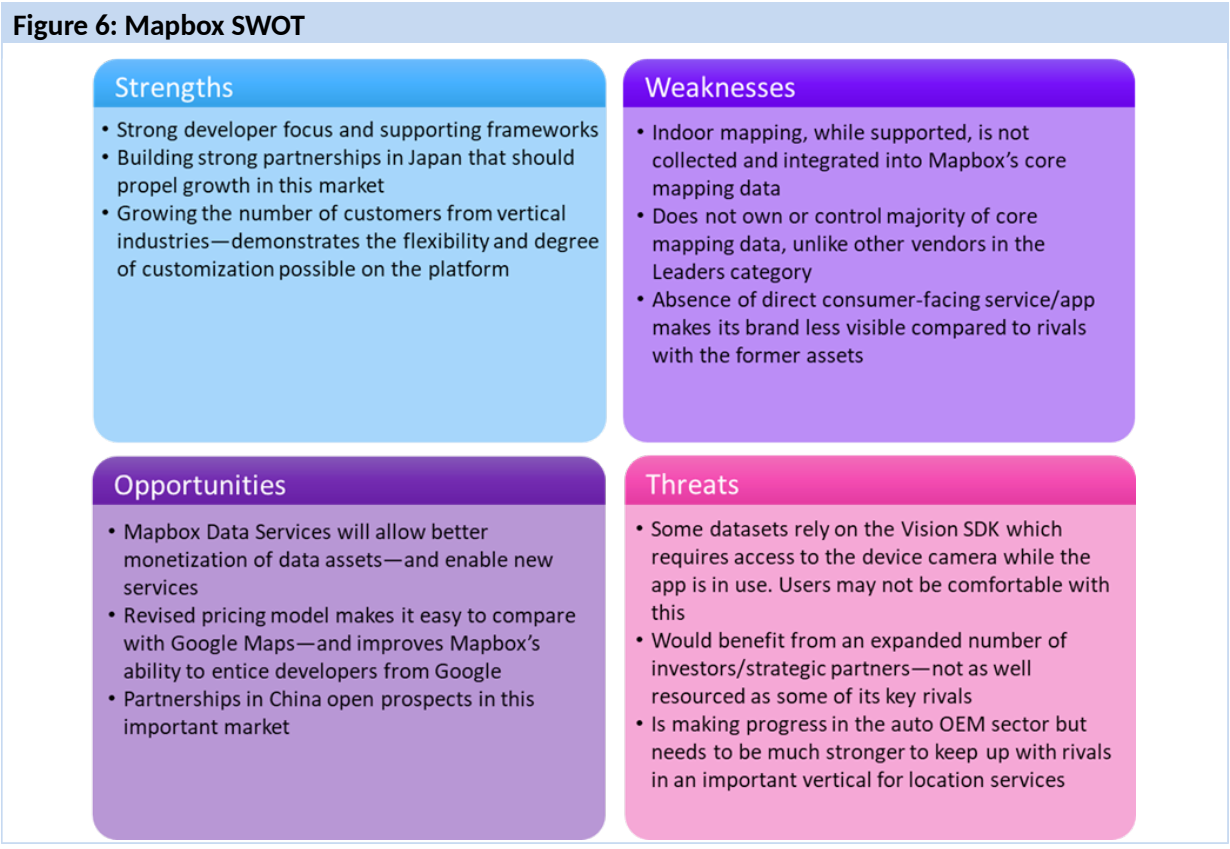
worldwide playing them during November 2019. The end of 2019 also saw Google introduce new functions to help developers create more immersive, contextualized games using the Google Maps Platform. This includes Playable Territories, which divides the real world into a virtual "game board." Another new feature can direct players to locations that are busier or quieter than others, based on desired gameplay scenario.

Mapbox

Mapbox has consistently improved its scoring over the past few years and joined the Leaders group in the last iteration. It now has a score of 6.24. Mapbox's platform has been built around developer needs with clear pricing and a wide array of APIs and SDKs, which has helped it achieve high scores in the Ecosystem category. Mapbox has over 1.5 million registered developers using the platform with 150,000 developers actively using the product each month. As well as making sure its platform appeals to developers, Mapbox has also worked on both its pricing for enterprise customers and the availability of trial services so that potential customers can get a taste of what is on offer on the platform.

Over 600 million consumers use Mapbox every month via 45,000 mobile apps built with Mapbox services. These end users generate more than 300 million miles of driving data every day for Mapbox's traffic data products.

Figure 6: Mapbox SWOT



Source: Omdia

Selected developments

- New pricing structure launched in November 2019 to improve value for customers.

- Mapbox and Hitachi Solutions announce a partnership in December 2019 to resell Mapbox licenses in Japan.
- Partnership with Yahoo! JAPAN to provide mapping services across all Yahoo! JAPAN online properties.
- New partnership with Strava in October 2019 to provide worldwide mapping—this includes more detailed data on trails and elevation contours.
- August 2019 saw the hire of a new CFO, Nitin Agrawal, a former Amazon finance executive. This hire will give Mapbox a greater understanding of how tech firms price their products.
- Mapbox launches Data Services, a data-as-a-service product that allows customers to purchase location-based datasets.
- Mapbox gains new partnership with Carahsoft, a leading government IT solutions provider, allowing for easier public sectoral deals in North America.

Selected highlights

Japanese expansion opens new opportunities

Since the last update of the index, Mapbox has secured new deals in Japan that will help it sell more effectively into that market. Mapbox and Hitachi Solutions announced a partnership in December 2019 to resell Mapbox licenses in Japan. Hitachi will assist in adapting Mapbox services for the Japanese market and fitting them to local business practices. Mapbox also launched Mapbox.jp and set up an office in Tokyo to provide local support to customers based in Japan. Alongside this, Mapbox announced a partnership with Yahoo! JAPAN in July 2019 to provide digital maps and location-based experiences across Yahoo! JAPAN services. This includes navigation, weather, and news.

Mapbox's new pricing structure is now in full operation

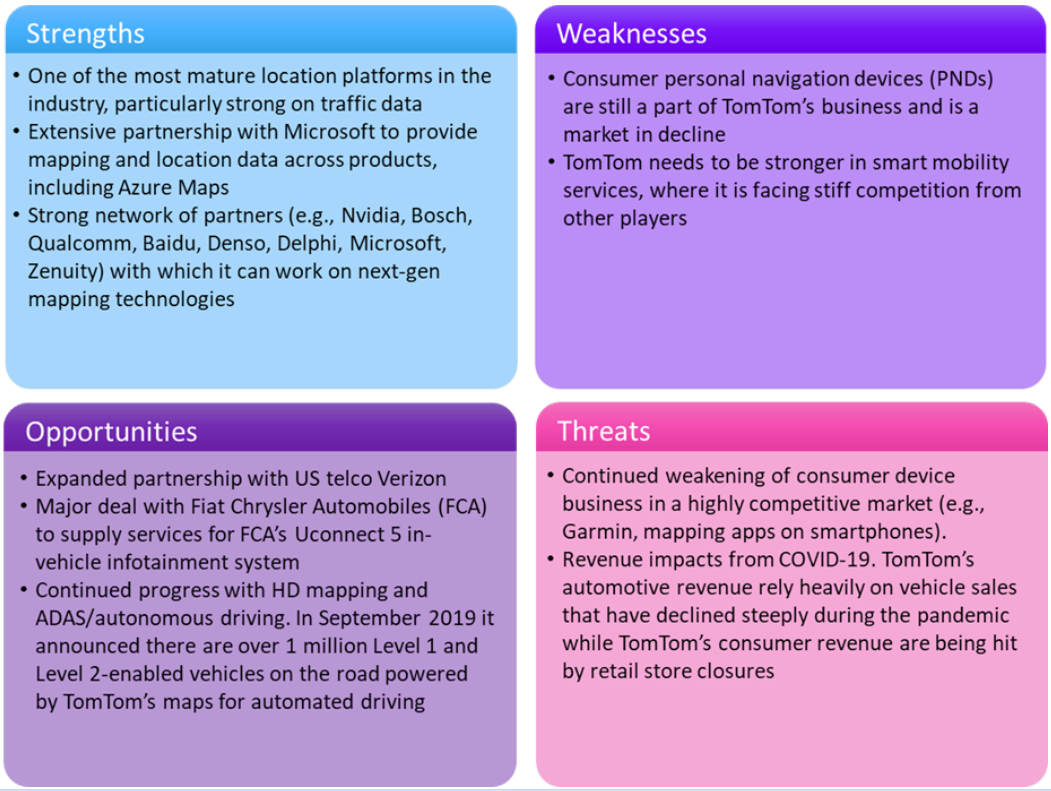
In November 2019, changes to Mapbox's pricing structure went into full effect to improve value for customers. All Mapbox APIs and SDKs are now available on a pay-as-you-go basis, so businesses do not need to commit in order to access services. Volume discounts are applied automatically although if companies are willing to commit to an annual volume, Mapbox is willing to negotiate increased discounts on a case-by-case basis. Mapbox has also increased the free tier making trialing services cheaper and easier. It has removed commercial restrictions so that developers can build for public consumption or internal use for the same price. It has made pricing better reflect use cases and the metrics already used by customers—this has meant aligning some of the pricing structure with Google's. This step will make it easier for Google Maps customers to compare Mapbox's pricing structure and make it easier for the company to lure Google Maps customers.

TomTom

TomTom remains comfortably in the Leaders category with a score of 6.24. TomTom is coming out from the other side of a period of major transition following the sale of its telematics business to Bridgestone for €910 million in the first quarter of 2019. TomTom divested its telematics business to concentrate on the automotive and enterprise segments. Toward this, TomTom has set in place a string of proof-of-concept and research initiatives that will bring long-term rewards for the company in HD mapping and autonomous driving/ADAS (see below for details). But it is facing intense

competition in HD mapping from HERE and Google, with the former proving particularly strong in this space.

Figure 7: TomTom SWOT



Source: Omdia

Selected developments

- TomTom's live and historical traffic data is being used by governments, authorities, NGOs, and media to provide insights into the economic activity of areas impacted by COVID-19.
- TomTom has deepened its partnership with US telco Verizon. In April 2020, Verizon announced it will integrate TomTom Maps APIs and SDKs into its location services offering, making it easier for the developers to build upon and integrate services. In October 2019, the two companies announced that they were collaborating on a project to make intersections safer for emergency vehicles by using TomTom HD Maps in conjunction with Verizon's 5G network to create a real-time simulation of the intersection.
- In June 2020, TomTom further enriched its point of interest (POI) data through a partnership with Foursquare, which includes access to access to Foursquare's trove of crowdsourced data such as written reviews, ratings, photos, and price ranges.
- Toyota Research Institute - Advanced Development (TRI-AD), DENSO, and TomTom announced in March 2020 that they were collaborating on an advanced map-making project.
- In September 2019, TomTom announced that its navigation platform has been integrated with the Microsoft Connected Vehicle Platform.
- TomTom announced several automobile partnerships in 2H19 and early 2020, including Fiat Chrysler Automobiles, returning on its efforts to focus on the sector.

Selected highlights

TomTom makes further advances in HD mapping and autonomous driving

TomTom has been working with partners Toyota Research Institute and DENSO on a successful proof-of-concept demo for a quick HD map-building method. Finding a way of building HD maps quickly will be essential for autonomous driving as such vehicles need to react to changes in road layout and signage. This proof of concept used a TRI-AD vehicle with DENSO sensors, TRI-AD's Automated Mapping Platform, and TomTom's cloud-based transactional mapping platform to visualize the road and generate inputs for the cloud mapping platform on the fly. This was announced in March 2020.

Earlier in 2020, TomTom and Hitachi Automotive Systems Americas announced that they had collaborated on a proof of concept for a real-time hazard service for navigation products and ADAS. The system would deliver real-time updates on upcoming hazards such as potholes and debris detected by vehicle sensors. The sensor data is uploaded to the Hitachi cloud then moved onward to TomTom Traffic for distribution to TomTom users.

In November 2019, TomTom, along with the University of Amsterdam, announced the launch of a research lab focusing on AI for developing HD maps for autonomous vehicles. In September of the same year, TomTom announced its own autonomous test vehicle designed to test and improve their autonomous driving technologies.

Auto partnerships gear up for TomTom

In January 2020, TomTom announced that it had won a global deal with Fiat Chrysler Automobiles (FCA) for maps, navigation, and live services for FCA's new Uconnect 5 in-vehicle infotainment system in all markets except China. The system will feature TomTom-powered electric vehicle services such as charging point availability and a map-based visualization of vehicle range. The product also includes destination prediction which will learn the driver's favorite places and prompt the driver with guidance at an appropriate time.

Subaru also chose TomTom as a mapping supplier in January 2020 for its 2020 Subaru Outback and Legacy models. TomTom maps and supplies navigation to the Alfa Romeo Giulia MY20 and Alfa Romeo Stelvio MY20 cars globally. This deal includes TomTom connected services such as Traffic, Speedcams, Online Search and Routing, Weather, Off Street Parking and Fuel Prices.

Challengers

Summary

The next major group in Omdia's index is made up of players that scored between 4 and 6 when scores for completeness and market reach were combined. This group consists of four companies: Apple, Microsoft, Esri, and Comtech Location Technologies (CLT). The scores for all the Challengers are shown in **Figure 8**, with a full analysis of the top two Challengers, Apple and Microsoft, to follow.

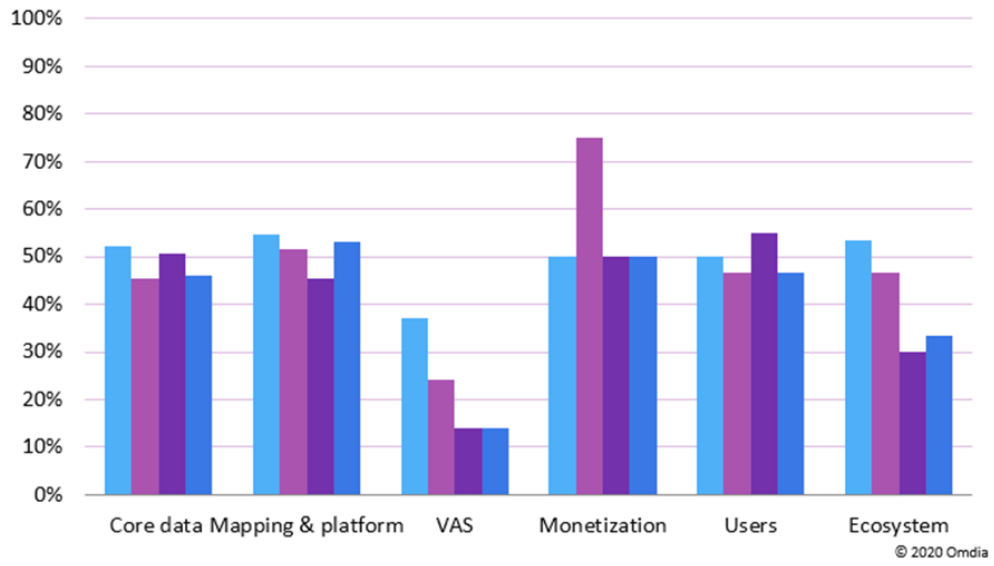
Esri scored 4.15, putting it firmly in the Challengers group. Its main product ArcGIS, a specialist analytics and mapping tool, has been on the market since 1999. Esri is the GIS market leader with customers in over 30 industries across the globe as well as being used in all 50 state governments. It continues to improve its product, particularly with partnerships. Recent deals include adding datasets via long-term partner Infogroup, partnering with Open Systems International to allow joint

customers to control their networks and analyze their networks in a much deeper way. Esri is also expanding its drone imagery product Drone2Map for ArcGIS via a collaboration with 3DR, which allows Esri customers to plan and realize drone flights.

CLT is snapping at Esri's heels being only 0.06 points behind at 4.09, CLT stands out for being particularly strong in the telco domain where it has a long-standing heritage and multiple partnerships. There are good opportunities for CLT to further explore how its location technology can be used to support 5G network deployments and enhance 5G services. Other commendable attributes include a commitment to privacy and prowess in public safety use cases. While CLT does not score as strongly for value-added services it does have robust mapping and platform capabilities including indoor mapping technology which does not require hardware such as beacons to be installed.

Figure 8: Challengers' scoreboard

	Apple	Microsoft	ESRI	Comtech
Total	**5.03**	**4.79**	**4.15**	**4.09**
Completeness	2.45	2.46	2.02	2.09
Reach	2.58	2.33	2.13	2.00



Source: Omdia

Apple

In the last iteration of the index, Apple slipped out of the Leaders category into the Challengers segment, where it remains with a score of 5.03. The most significant development since the last update is the long-awaited release of the new version of Apple Maps, starting in the US and followed by other markets through 2020. Overall, it is a solid rather than spectacular revamp, and so far, only the US has leveraged Apple's newly created own map data. Taken together this means it is still too early to give a definitive verdict on whether the revamped Apple Maps will turn around Apple's fortunes in the location and mapping domains.

Selected developments

- In April 2020, Apple released a mobility data trends tool from Apple Maps to provide government and health authorities and organizations with insights that will help them mitigate the spread of COVID-19. Using aggregated data from Apple Maps, the new tool indicates mobility trends for major cities and 63 countries or regions.
- Reports in January 2020 say that Apple Maps has "hundreds of millions" users in over 200 countries and territories. This is significant as it is the first update on Apple Maps users released in some time, albeit in ballpark terms.
- The US is the first market to leverage Apple's newly created core maps data, which the company says has enabled more detailed map data in the new version of its consumer app launched in that market.

Selected highlights

Revamped Apple Maps using the firm's own map data debuts in the US

Apple finally released the long-awaited revamp of Apple Maps in the US, although many features are enhancements and improvements rather than completely new capabilities. One of most significant aspect of the US release is that it uses Apple's newly created core mapping data, which the firm intimates has enabled more detailed maps in this market compared to previous iterations that relied predominantly on mapping data from long-standing partner TomTom. Apple has spent the last two years or so building its map data, which is gathered by Apple's own fleet of sensor-equipped vehicles and from anonymous iPhone users that consent to share it. Alongside this, Apple is gathering new high-resolution satellite data to layer with the drive data and iPhone data.

The redesigned Apple Maps has a Look Around feature, which provides interactive street-level imagery with high-resolution, 3D photography that is similar to Google's Street View. Other enhancements include real-time transit updates, a Collections lists of favorite places contributed by users, a feature to share estimated time of arrivals (ETA), improved indoor mapping, and improved Siri Natural Language Guidance.

Using privacy as a point of differentiation

Apple is a self-professed champion of consumer data privacy and so it should come as no surprise that the vendor is putting privacy center stage in the revamped Apple Maps. Apple Maps is not connected to Apple ID and requires no sign-in. Personalization features are created using on-device intelligence while any data generated when using the application is associated with random identifiers not individuals. There is also a so-called "fuzzing" feature whereby precise location is changed to a less precise one after 24 hours.

Microsoft

Microsoft remains in the Challengers segment, (which it moved into with the last update of the index) with an improved score of 4.79 that has seen it close the gap to Apple. Microsoft has two core location propositions: Azure Maps and Bing Maps. The two are similar in some respects but have different features, pricing models, and focus. Azure Maps (formerly Azure Location Services) is an enterprise/industry verticals proposition hosted natively in Azure Cloud and is part of Microsoft's growing Azure IoT portfolio. The core Azure Maps APIs are similar to those offered by rivals such as HERE and Google, but Microsoft is constantly enhancing Azure Maps and has developed a compelling

roadmap for the proposition going forward, including plans for vehicle services, remote sensing, and AI-related APIs. Bing Maps is Microsoft's B2C app that competes with Google Maps and Apple Maps, although it is still not as strong as the latter offerings.

Selected developments

- In October 2019, Microsoft released a public preview of Azure Maps Weather services via a partnership with AccuWeather.
- In April 2020, the Azure Maps Matrix Routing API was made generally available. The service allows calculation of a matrix of route summaries for a set of routes defined by origin and destination locations.
- In May 2020, the Azure Maps Creator visualization feature for private spaces entered public preview.
- New territories announced for Azure Maps—in September 2019 it was madeavailable in Argentina, India, Morocco, and Pakistan.
- Ongoing improvements to Bing Maps APIs and solutions, including those of particular value during the COVID-19 pandemic.

Selected highlights

Smart new features for Azure Maps

Data visualization is one of Azure Maps' key strengths and the new Creator service (in public preview) builds on this and resonates with Azure's growing expertise in the digital twins domain. Creator allows enterprises to upload data sources about private indoor or outdoor spaces along with associated asset information (things/objects within a space) to Azure Maps, and then use spatial intelligence and visualization capabilities to manage, monitor, and track assets within a space. Indoor spaces could include offices, malls, and airports while outdoor spaces could be anything from forests to parks and resorts.

The Weather Services APIs, in partnership with AccuWeather, will add richness to Azure Maps by bringing a layer of real-time, location-aware information. Weather is a critical factor for many use cases, for example in matters of road safety, weather impacts on the battery life of electric vehicles, weather data to help assess claims in the insurance industry, or for retailers in determining the need for certain goods.

Besides the improvements discussed, Microsoft is building out a compelling roadmap for Azure Maps with a flow of new APIs and services in key mapping segments. This includes the automotive industry where Microsoft plans to release a new set of Azure Maps APIs and capabilities in 2021, including HD Maps. This is a logical move given that Microsoft has developed its own connected vehicle platform (Microsoft Connected Vehicle Platform – MCVP).

Steady, incremental improvements to Bing Maps

In April 2020, Microsoft improved the Bing Maps Multi-Itinerary Optimization (MIO) API, a service that automates the building of itineraries for multiple agents (e.g., drivers, sales reps) while also optimizing the routes among all agents involved. The new features include pick-up and drop-off location sequencing dependencies, vehicle capacity, and quantities to be picked up or dropped off at each location on an itinerary. These enhancements are particularly useful during the COVID-19 pandemic that is seeing a surge in demand for deliveries but in a context where routing is more

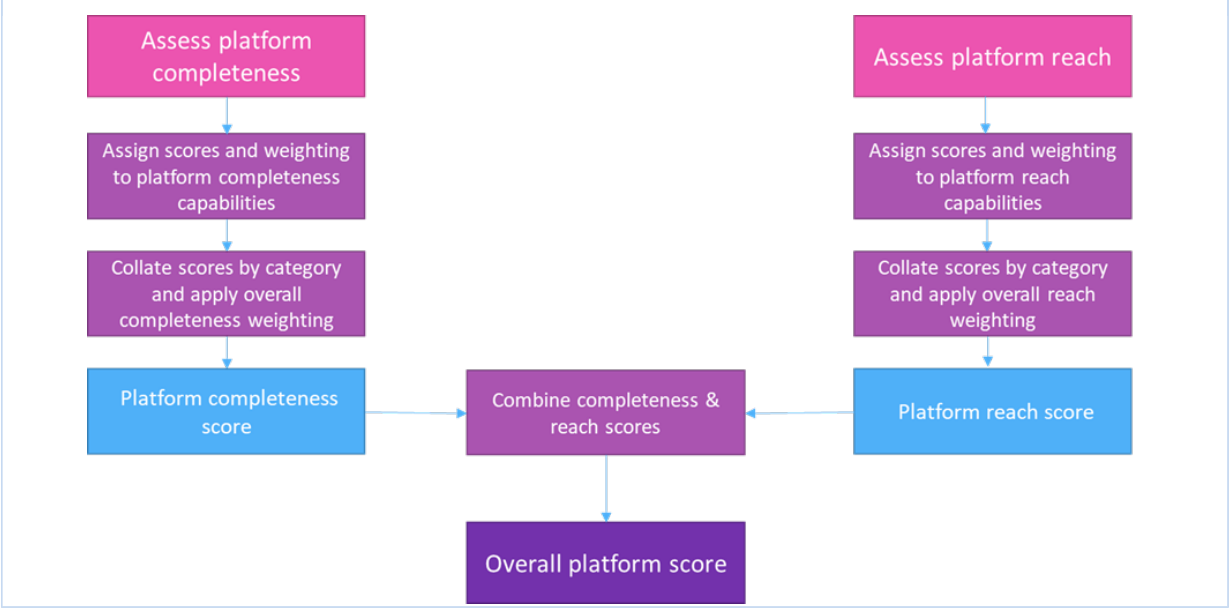
challenging than normal due to lockdowns and travel restrictions. Microsoft has also enhanced Bing Maps routing and logistics APIs (March 2020), including one that provides routing calculations that take into accounts border restrictions (e.g., visa requirements, restricted goods, customs duties). In November 2019, Microsoft announced Bing Maps GeoAnalytix was available in public preview. The solution expediates the analysis of location intelligence data for faster decision making.

Appendix

Methodology

A summary of the methodology used for Omdia's Location Platform Index is shown in **Figure 9**. Data for the index is collected from a range of sources, including vendor briefings, product data, financial results, press releases, and related Omdia research and expertise.

Figure 9: Location Platform Index methodology



Source: Omdia

The location platform score, which is expressed as a number from zero to 10, is a combined measure of the completeness of a vendor's location platform offering and the market reach of that platform.

Completeness includes a platform's core data, mapping functions and the value-added services—provided directly or via partners. Completeness also takes into account a player's monetization strategy. A full list of the attributes included in the Completeness parameter and a corresponding explanation/example in shown in **Table 1**. Each attribute is given a score of between 1 and 5 depending on a vendor's capabilities. Each attribute also carries a weighting, which when combined with the actual score creates the total completeness score.

Table 1: Location Platform Index Completeness criteria

Core data	
Ownership of core mapping data	Does the company own the core maps data, and/or is a partner(s) core map used?
Data analytics	A vendor's capabilities in this area—tools, functionality and other enhancements.
Extent of data collaboration & partnerships	The number and nature of partnerships are in place to enhance data capabilities, features and functionality (excludes partnerships for access to core map data, or technology partnerships).
Data exchange	The provision of own data exchange or participation in one.
Crowd sourcing	The level of support for crowdsourcing capabilities.
Data privacy	How effectively a vendor safeguards consumer and data sources, and complies with relevant regulatory frameworks (e.g., the General Data Protection Regulation [GDPR] in the European Union).
Additional capabilities	Any other core data capabilities or assets in this area.
Mapping & platform capabilities	
Depth of map coverage	The depth and detail of map coverage (as opposed to markets) (e.g., miles of roads mapped).
Underlying AI capabilities	What AI technology and capabilities have been used to enhance the core platform?
Detail of traffic information	What level of traffic information does the platform have e.g. support for real time traffic updates, lane level traffic information; other features?
Business Listings/PoI	What is the range and depth of PoI information offered by the platform?
HD mapping	Level of support for and capabilities in HD mapping.
Indoor mapping	Level of support for indoor mapping capabilities.
Aerial mapping	Support for aerial mapping capabilities.
Support for voice commands	The extent to which a platform supports interactions with maps & related services via a voice interface/commands.

Over-the-Air (OTA) VAS/firmware delivery	Solutions for OTA VAS and/or firmware delivery—the vendor's own or third party. Note this goes beyond standard OTA core mapping refresh/updates.
Additional capabilities	Any other mapping functions and capabilities.
Value-added services	
ADAS	Functions/services based on Advanced Driver Assistance Systems.
Automated Driving	Capabilities, level of development, and support for automated driving.
Mobility services	Integration with mobility services such as ridesharing, public transport.
Integration of payment/commerce services	Integration of payment services or related commerce such as offers, promotions.
Integration with digital assistants	Integration with AI assistants such as Alexa.
Augmented reality	The provision of augmented reality features and services as part of the mapping proposition.
Location business Intelligence	The provision of business intelligence tools that blend and analyze enterprise and geographic data to help organizations optimize insights and enhance performance.
Additional capabilities	Any other VAS to highlight.
Monetization	
Business model	Business model(s)—does the vendor rely on licensing or have multiple revenue streams.

Source: Omdia

Reach is more narrowly focused compared to the platform completeness attributes with the latter taking into account the number of customers a vendor has (both consumer and enterprise), the size of the developer community that supports the platform, the developer framework offered to that community, the number of industries a vendor can address, and the number of auto OEMs that leverage the platform. A full list of the attributes included in the Reach parameter and a corresponding explanation/example in shown in **Table 2**. The scoring system is based on the same principals as before.

Table 2: Location Platform Index Reach criteria

Users	
Geographic markets	The number of countries where services are available.
B2C consumer customers	The number of users of a consumer facing service (if available).
B2B, enterprise customers	The number of enterprise customers.
Auto OEMs on the road	The number of auto OEM customers enabled by the mapping platform
Vertical industries served	Considers the number of industries you served and the depth/expertise within those served.
Ecosystem	
Industry partnerships	Partnerships that give access to or enhance positioning in key industry verticals.
Geographic partnerships	Partnerships that are designed to give access to new markets, or to improve reach in an existing market.
Number of active developers	Size of the vendor's developer network.
Developer framework	Depth and breadth of developer frameworks (e.g., number and range of APIs, flexible pricing & business models, developer tools & support).

Source: Omdia

Further reading

Blockchain Technology and Adoption Trends, INT003-000417 (December 2019)

"Blockchain is good for more than just Bitcoin," INT003-000394 (September 2019)

Service Provider Routers & Switches Market Tracker – 4Q19(February 2020)

"CenturyLink goes 'colorless' and takes on the edge cloud" (February 2020)

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