SAMPLE

GLOBAL CONTEXT-AWARE COMPUTING MARKET (2021 - 2026)

The study offers:

- A detailed understanding of the current market dynamics and growth opportunities
- An overview of the competitive intelligence, along with product innovations and strategies of the major players
- An assessment of the impact of COVID-19 on the market ecosystem

Domain: ICT	Base Year: 2020	Forecast Period: 2021-2026

Mordor Intelligence

Industry Reports | Consulting | Intelligence Center

+1 617 765 2493 | info@mordorintelligence.com | www.mordorintelligence.com

DISCLAIMER

Any information and/or material provided by Mordor Intelligence, including any and all the analysis and/or research by Mordor Intelligence, is provided to a selected group of customers, in response to orders for such information, material, analysis, and/or research. As a customer of Mordor Intelligence, you acknowledge that our information, material, and/or services are for your internal use only, and not for any external use and/or dissemination, or general publication, and/or disclosure to any third parties.

Any and all the information and/or material provided by Mordor Intelligence are based on primary interviews and/or secondary research, and are, therefore, subject to fluctuation and variance. Mordor Intelligence takes no responsibility for any incorrect information and/or material supplied to us by the sources we rely on, and no part of our analysis or research may be given, lent, resold, or disclosed to any third parties, including non-customers, without explicit or written permission from Mordor Intelligence.

Unauthorized reproduction and/or transmission of our information, material, analysis, and/or research in any form and by any means, including photocopying, mechanical/electronic recording, or otherwise, without the explicit and written permission of Mordor Intelligence, is expressly and clearly prohibited.

Any use of the information, material, analysis, and/or research provided by Mordor Intelligence is at your sole risk; you acknowledge that the information, material, analysis, and/or research is provided “as is”, and that Mordor Intelligence provides no warranty of any kind, express or implied, with regard to the information, material, analysis, and/or research, including but not limited to, merchantability and fitness for any purpose and/or use.

STUDY ASSUMPTIONS AND MARKET DEFINITION

STUDY ASSUMPTIONS

- The base currency considered was the US Dollar (USD). Conversion of other currencies to USD was considered on the basis of the average exchange rates of the respective review-period years. The exchange rate conversion for the forecast period was determined according to the base year's conversion rates.
- The base year was identified, based on the availability of annual reports and secondary information. The base year considered for this study is 2020.
- The review period considered for this study is from 2014 to 2019. The CAGR is considered for the forecast period of (2021-2026).
- Inflation is not a part of the pricing, and the average selling price (ASP) was kept constant throughout the forecast period for each country.
- Distribution of the primary interviews conducted was based on the regional share of the market and the presence of key players in each region.
- As a result of data triangulation, through multiple methodologies and approaches, the weighted averages of the resulting estimates were considered to be the final values.

MARKET DEFINITION

- Context aware computing is fundamentally a type of computer operation that anticipates use cases or, can work in customized ways based on the user's context of activities. Based on its application, it can be applied either to a user's activities on their device, or the physical environment in which the users' devices are being used.
- In the scope of application medium, we have considered smartphone, tablet, PC, hearables and wearables, AR/VR devices, and other devices.
- A tablet, a portable computer, or a mobile device that switches the orientation of the screen, maps that orient themselves with the user's current orientation, the devices adapting the zoom level to the current use speed, and switching on the backlight of the mobile phones when used in the dark are few examples of the context aware solution equipped devices that are aware of their environment and the context of use.
- The study in consideration deals with different vendor types and applications in end-user industries along with geographical developments, and driving factors on both global and regional space, which are influencing the context aware computing demand and growth.
- Key vendor profiles consists of companies that are offering context aware computing solutions in line with the study scope. Vendor profiles discuss the company strategies, products, and SWOT analysis in line with the Context-aware computing market.

TABLE OF CONTENTS

SCOPE OF THE STUDY

BY VENDOR

Device Manufacturer

Mobile Network Operator

Online, Web, and Social Networking Vendors

BY END-USER INDUSTRY

BFSI

Consumer Electronics

Media and Entertainment

Automotive

Healthcare

Telecommunication

Logistics and Transportation

Other End-user Industries

BY APPLICATION MEDIUM

Hardware

Software

GEOGRAPHY

North America

Europe

Asia-Pacific

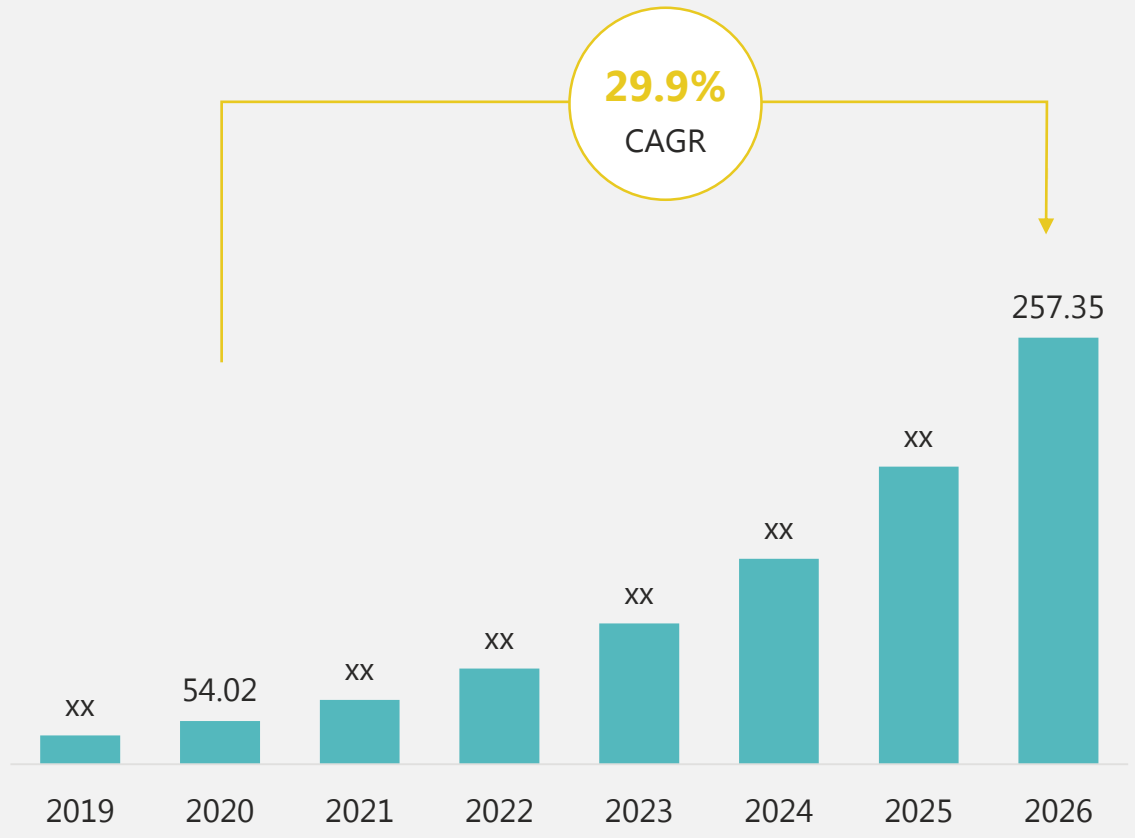
Latin America

Middle East & Africa

EXECUTIVE SUMMARY

CONTEXT AWARE COMPUTING MARKET

Revenue In USD Billion, Global, 2019-2026



SOURCE: Mordor Intelligence

01

The global context aware computing market (henceforth, referred to as the market studied) was valued at USD 54.02 billion in 2020, and it is expected to reach USD 257.35 billion by 2026, registering a CAGR of 29.9%, during the period of 2021-2026 (henceforth, referred to as the forecast period).

MARKET OVERVIEW

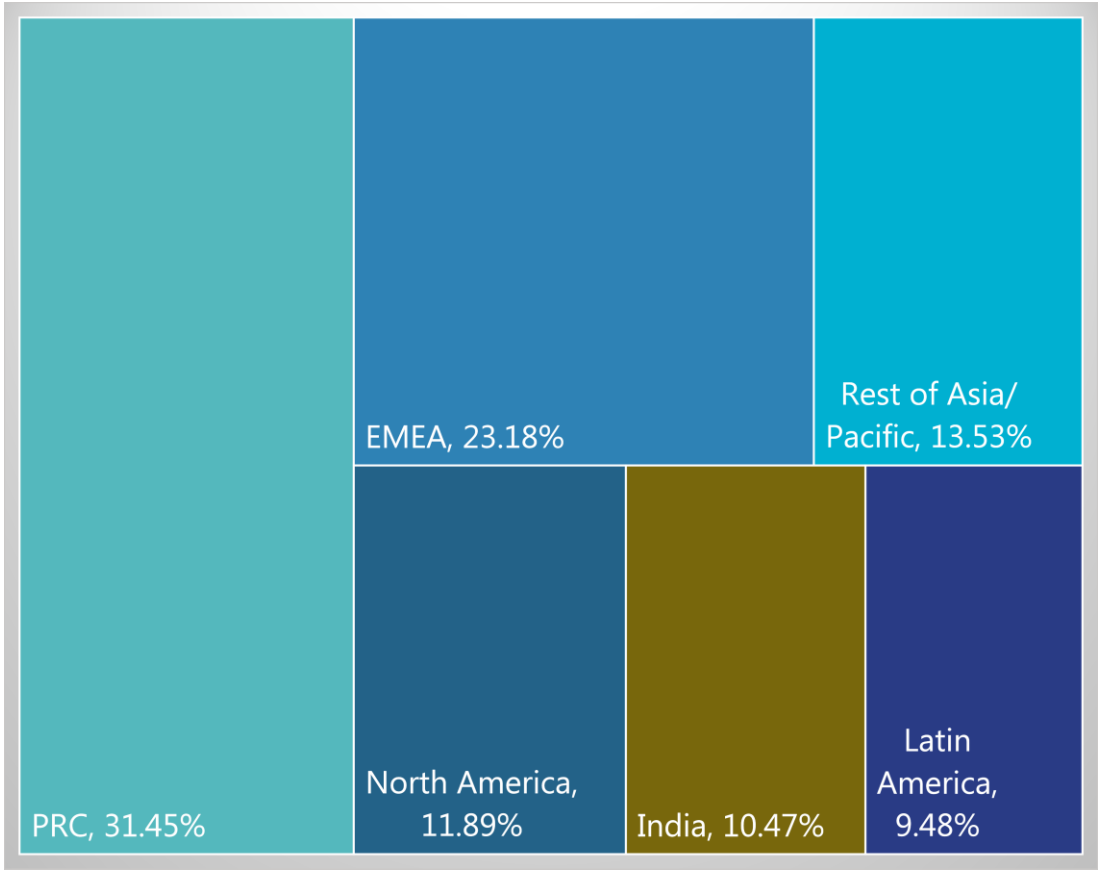
- According to Oracle Corporation, Context-aware technology portrays a system that can detect any relevant information and adapt in accordance to improve an interaction with the system. In this new technology vision, the software is more capable to respond to the complexities of the real world in an effective manner. It achieves this by applying rules around location, time, event, or other context provided by the environment in which it is executed.
- Interest in context-aware computing is being motivated by the latest trends in technology, including cloud, mobile, social, and big data. Context-aware computing technology has been around for decades, but with the surge of the industrial internet of things (IIOT) and the ubiquitous nature of mobile devices, context-aware technologies are now projected to help drive the future of various end-user industries and the utilities sector in particular.
- The rising requirement of IoT devices in several end-use industries is also driving the market for context aware computing. For instance, in January 2020, CEVA Inc., one of the major licensor of wireless connectivity and smart sensing technologies, launched their SenslinQ integrated hardware IP and software platform that aggregates sensor fusion, sound and connectivity technologies to allow contextually aware IoT devices.
- Contextual awareness is rapidly becoming a compulsory feature of many devices like smartphones, laptops, robots, AR/VR headsets, hearables and wearables, driven by OEMs and IT companies looking to add value and enhance the user experience. CEVA Inc's SenslinQ platform streamlines the development of these devices by centralizing the workloads that require an intimate understanding of the physical behaviours and anomalies of sensors. It collects data from multiple sensors within a device, including microphones, radars, Inertial Measurement Units (IMUs), environmental sensors, and Time of Flight (ToF), and conducts front-end signal processing such as noise suppression and filtering on this data.
- A company's ability to respond rapidly to an individual's changing situation is critical for building brand loyalty. Considering that advanced mobile technology will be globally ubiquitous by 2020 with 70% of people using smartphones and 90% covered by mobile broadband networks and 80% of all mobile data traffic will come from smartphones by 2020 (Ericsson Mobility, 2020), and that most people keep them within arm's reach, smartphones offer unprecedented access.

MARKET OVERVIEW

- Mobile apps are becoming more sophisticated and able to understand how to proactively interact with users, thus boosting mobile consumer marketing through context-aware, hence fuelling the growth of the market being studied. One of the major benefits of context-aware technology is the heightened level of personalization that's now possible. Companies have the freedom to design and offer experiences that vary by individual customer and can design immersive customer experiences, offering self-service options.
- According to a new article published in Harvard Business Review, 2019, 86% of organizations surveyed agreed on the fact that the ability to extract new value and insights from existing datasets/analytics applications is critical in emerging technological industry ecosystem, 75% of the organizations were of opinion that it's critical for industries to deliver actionable intelligence to employees across the enterprise for better functionality. Context-aware technology is capable of collecting massive data about customer behaviour, habits, engagement, preferences, and more. Companies that understand their customers on a deeper level will far outpace their competitors.
- Healthcare systems over the forecast period are expected to integrate new computing paradigms. Context-awareness computing can reduce network traffic, by using the framework, the information gathered from the environment and patient condition will be processed using the designed component development along with sensor interface framework and multi-purpose gateway to process the contextual data and send to medical centres, hospital or patients mobile device as healthcare services.

ESTIMATED SMARTPHONE SHIPMENTS WORLDWIDE, 2020*

Share (%), By Region, Global, 2020*



*Forecast
SOURCE: Morgan Stanley

MARKET OVERVIEW

- As per the data compiled by Road Accident Data Management System (RADMS) for the past three years, ending on June 2019, roughly 95% of the accidents on the road are attributed to the human errors as a casual factors. Although context-aware systems have not been thoroughly used to assist driving tasks, it can improve situational awareness and reduce driver errors. As the technology, has great potential to save lives and prevent injuries on the road, it could thus potentially reduce road crashes, consequently boosting the growth of the market.
- Financial services offered through mobile devices are becoming more context-aware and moving beyond replacing the basics one can do on a web site. According to GSMA Report 2019, with mobile industry connected over 3.5 billion people to the internet (47% of the global population), and smartphones being the primary means of internet access in LMICs (low- and middle-income countries), in 2018, across 18 LMICs, an average of 57% of those who had used the internet accessed it exclusively via a mobile phone.
- While the mobile, financial services customer experience has been cumbersome and time-consuming with codes, passwords, and security questions, advances in context-aware computing has enabled the mobile customer experience to be on par with other mobile experiences. Budding context-enriched services are predicted to use situational and environmental information about the user's presence, social attributes, location, etc. to foresee end users' immediate requirements.
- The augmented reality (AR) market gives meaningful possibilities, as it is supposed to observe a heightened proliferation of AI, which takes the data from a wearable device and connects them with personal data, to determine the current context in real-time and push essential data to a user, in line with customer needs and demands.
- According to UBS, AI industry with 20% annual growth rate, has been projected that it has the potential to reach a total market cap approximated at USD 120-180 billion by 2020 to 2021. Developing AI in mobile apps is expected to enable the businesses to provide personalized, seamless, and relevant customer services. The ability of a context aware computing technology mobile app to provide content or features to a customer, relevant to either the customer location or availability of mobile network is expected to improve business opportunity by offering effective services.

MARKET OVERVIEW

- Over a period of time, the AI in mobile apps collects massive amounts of data from the previous customer's questions and understands customer behaviour; this helps in increasing the customer retention rate, as it connects the customers closer to the business. In the Industry 4.0 and Internet of Things environment, things will sense more data, become context aware, and provide value-added information to assist people in taking more relevant and valuable decisions.

- The Evolution of Context-Aware Technology in the Utilities Industry has become more common, and firms are relying heavily on the platforms on which a digital product or digital ecosystem lives. Recently, Exelon, one of the largest utility companies in the world, inked a major deal with General Electric for GE to deploy its full suite of Predix software across all of Exelon's nuclear, wind, hydroelectric, solar and natural gas facilities.

- Advancements in sensors, visual and gesture-recognition equipment, and the wireless tagging technology of RFID have also been important precursors to the age of context-aware gaming, though the potential in this area is the most untapped of any context-aware gaming technologies. Owing to the shift into an era that will be dominated by the ability to sense context, it is concluded that games are again a leading driver.

- Pervasive games are a type of digital games that combines game and physical reality within the gameplay. These games implement new role of computational technology to enhance computer game design and computer-gaming experience. With Wi-Fi coverage becoming broader and cheaper in the coming years, one clear winner will be context aware computational technology based pervasive gaming.

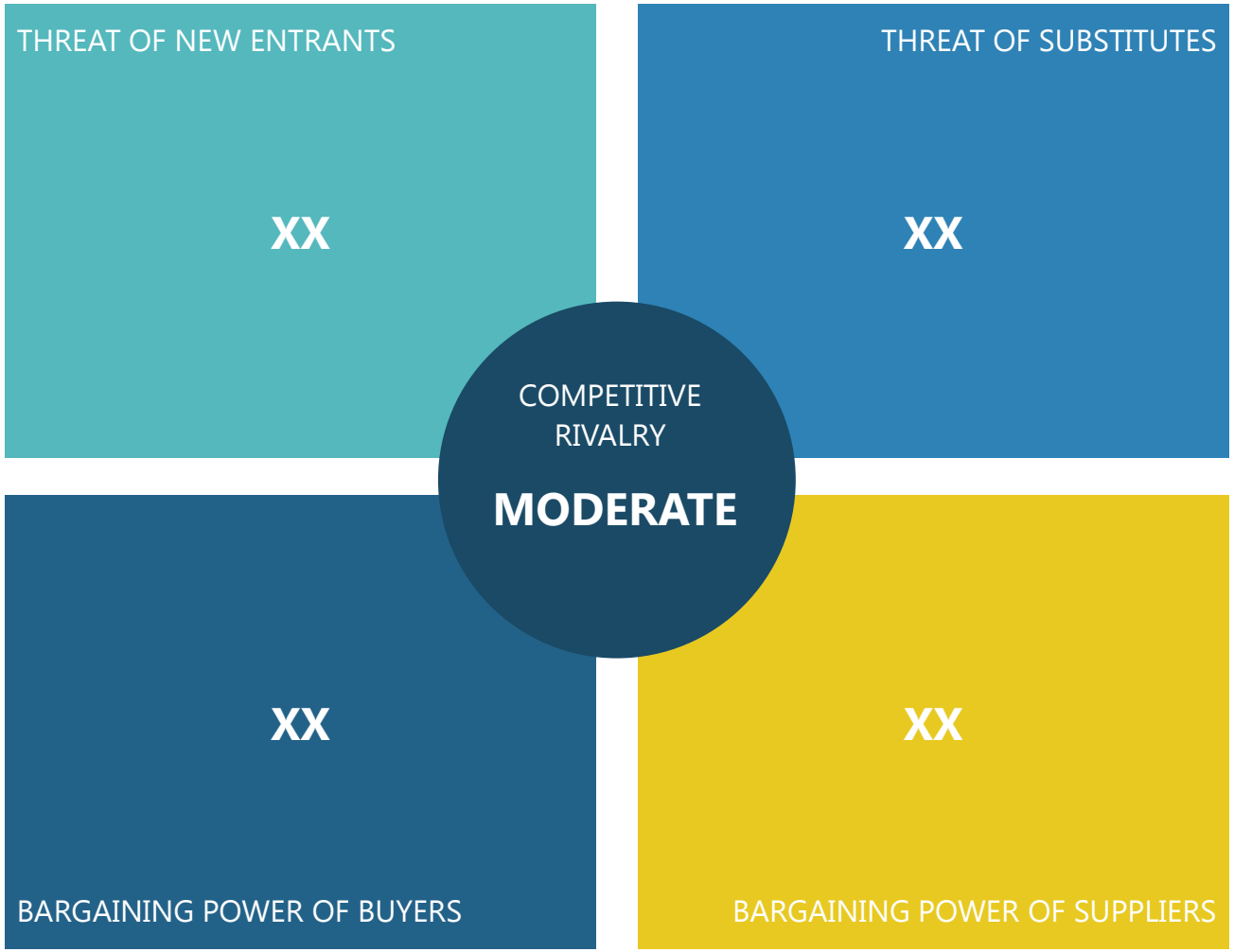
- In April 2020, Google announced a beta that enabled admins to control access to Security Assertion Markup Language (SAML) apps based on context. In September 2020, Google made this feature generally available. Users can use Context-Aware Access (CAA) to create granular access control policies for pre-integrated SAML apps or custom SAML apps based on attributes, including the user, location, device security status, and IP address. This can improve the security posture by reducing the chances that there's unintended access to specific apps and the data in them.

MARKET OVERVIEW

- Non-destructive testing (NDT) involves inspection, testing, or evaluation of components, materials, or assemblies. NDT involves examination for disparities in characteristics or discontinuities, primarily without hampering the serviceability of the product or part.
- Re-usability of an object after inspection with little to no effect on operating performance, coupled with the right balance between quality control and cost-effectiveness, positioned NDT as a go-to solution across all end-user verticals. The factors significantly driving the growth of the market include stringent regulations mandating safety standards and rising focus on safety and maintenance of aging infrastructure.
- Non-destructive testing equipment emerged as an essential part of every industrial toolbox. Building welded structures or industrial plants without NDT would be synonymous to building without cleaning or measuring or welding. Maintaining aircraft, refineries, or rotating equipment without NDT would be like maintaining without lubrication or checking for corrosion or tightness.
- In terms of technique, ul[illegible]emental innovations aimed at filling gaps in the exis[illegible]ting, the market for phased array ultrasonic testing is witnessing saturation, while guided wave ultrasonic testing is being dubbed as one of the most significant techniques.
- Furthermore, approximately 70%-80% of the sales of NDT, primarily related to equipment manufacturers, such as GE and Olympus, are catering to NDT service providers, such as Acuren and Applus RTD, mainly through a wide variety of distributors and local representatives, such as Inspection Technologies Inc. and Detek.
- The equipment market is largely dominated by market incumbents with greater access to R&D and expansion funds. High barriers of entry for new players and high acquisition costs are expected to affect the long term profitability in the market.
- Cost remains a major hindrance in this market, as inspection service providers are focusing on expanding their base rather than adopting new practices. High replacement costs are expected to deter the long term growth of the market studied.

Detail Analysis Available with the Report

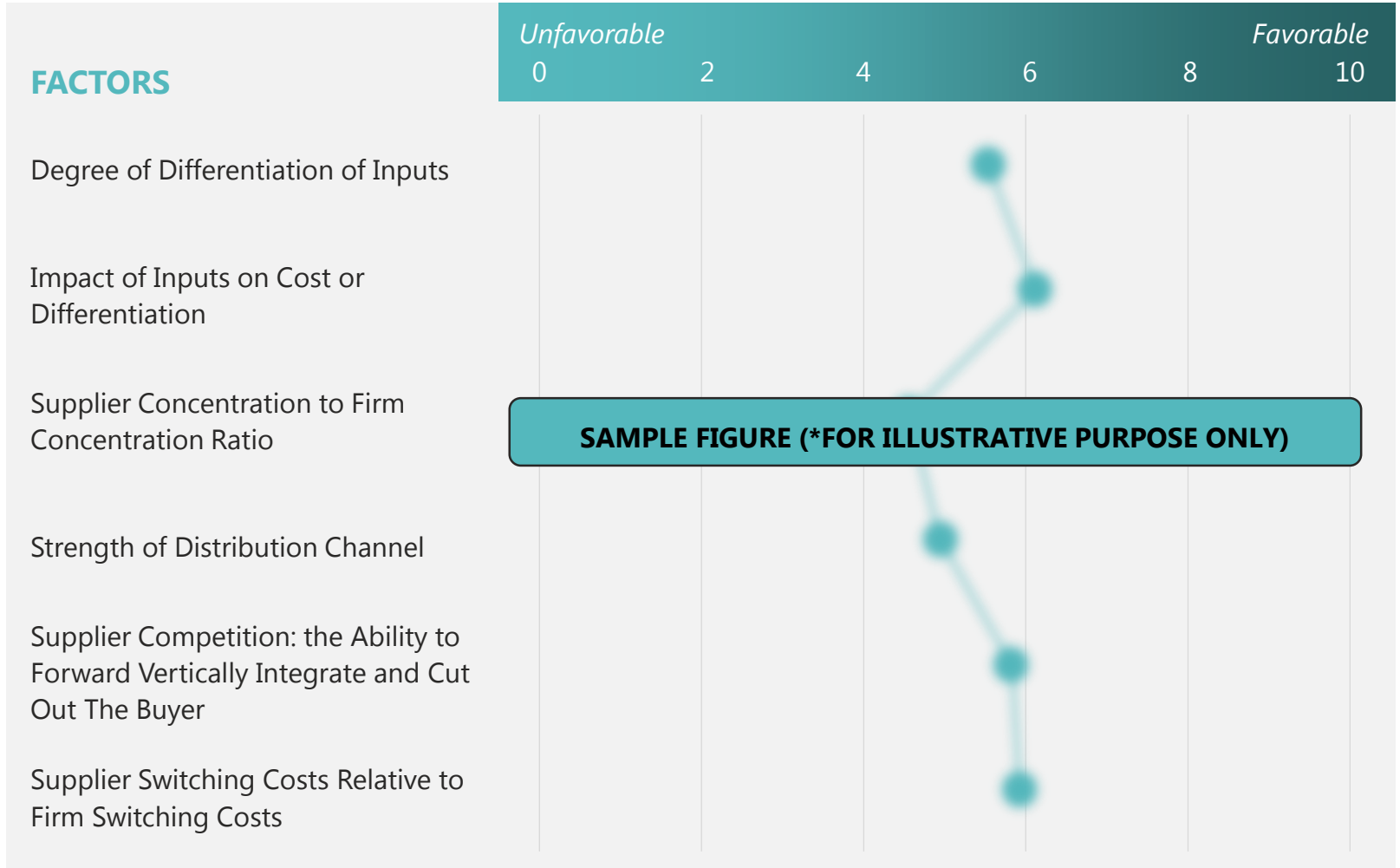
PORTER'S FIVE FORCES ANALYSIS



- The Porter's Five Forces model studies the five identified competitive forces that shape every industry and market, in order to determine the intensity of the competition, and thus, the profitability and attractiveness of the industry.
- The objective of the growth strategy should be to adapt to these competitive forces, in a manner that may improve the position of the organization.
- This study includes an exhaustive Porter's Five Forces framework, incorporating the factors influencing each force, to analyze the market from a microeconomic perspective.
- In this study, Porter's five forces are analyzed, considering the factors influencing each force and quantifying the factors through primaries and quantitative analysis. The quantified factors are further mapped out to derive the impact of each force on the competitive dynamics.

BARGAINING POWER OF SUPPLIERS

MARKET FAVOURABILITY



****Full Porter's Five Forces analysis will be provided in the Final Deliverable**

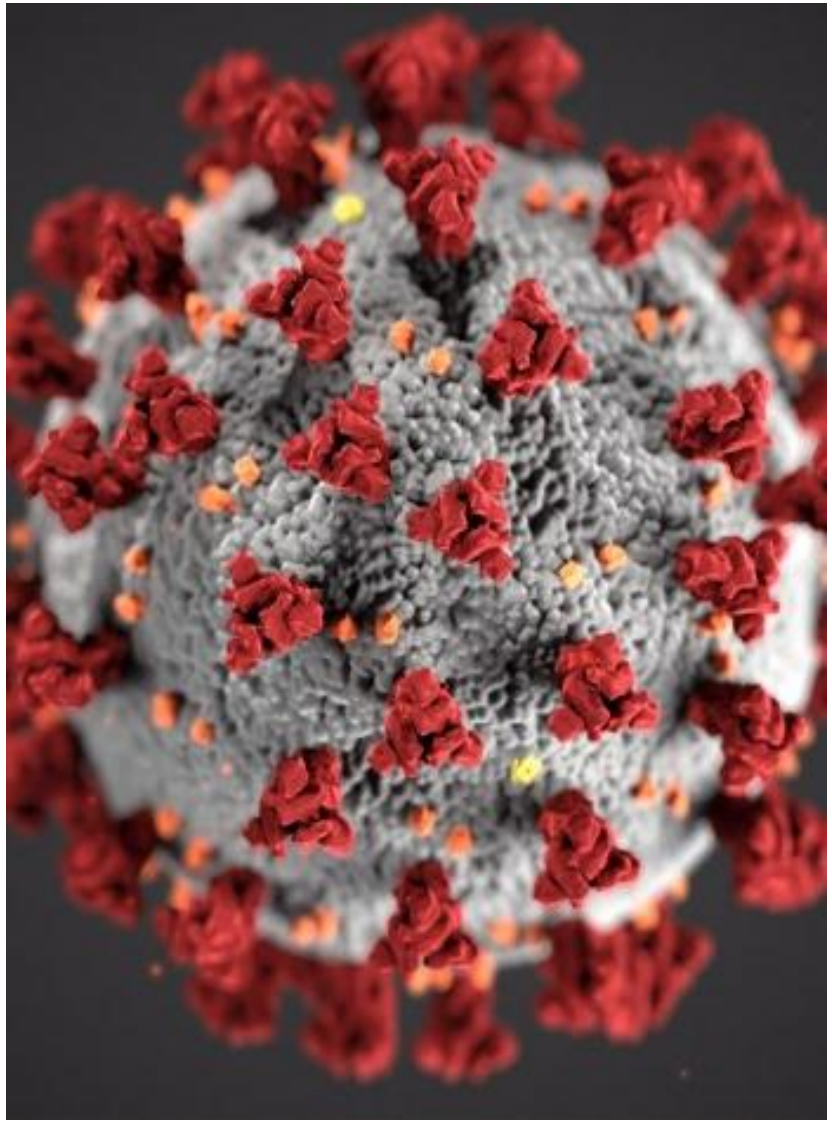
DETAILED DESCRIPTION

- The suppliers in the market are the solution providers, vendors, application providers, and service providers of CAC. The suppliers in the market studied are the service/solution providers.
- With medium product standardization and differentiation on the hardware components and lower supplier to buyer concentration, the bargaining power of suppliers is weakened in the market.
- [illegible]
- [illegible]
- [illegible]

Detail Analysis Available with the Report

IMPACT OF COVID -19 ON THE MARKET

IMPACT OF COVID-19 ON THE MARKET



- According to China Academy of Information and Communications Technology (CAICT) published data, owing to the spread of the COVID-19 pandemic, mobile phone shipments in China in March 2020, totalled 21 million units, roughly 20% down compared with March 2019. As smartphone industry has customers for Context Aware Computing market, the drop in sales might impact the market being studied.
- The COVID-19 pandemic is already ushering in a host of disruption and challenges to industrial manufacturers, especially those that are dependent on such workers whose jobs cannot be carried out remotely. Moreover, according to a recent survey of the National Association of Manufacturers (NAM), It has been estimated that, owing to pandemic, 80% of manufacturers will have a financial impact on their business.
- As context aware information distribution may offer substantial value to manufacturing, by providing task-relevant information or services to users in a manufacturing shop-floor improving decision making through context-driven recommendations, the COVID-19 pandemic has a substantial impact.
- AS the COVID-19 pandemic continues to grow, retailers have stepped up their efforts when it comes to giving consumers with primary goods and to protect the health and well-being of communities. Due to the growing demand for essential non-discretionary products, retailers are suffering from network-wide shortages. To combat this, retailers are working closely with companies across their supplier bases.
- The pressure on transport organizations has moved from moving citizens to holding a core system operational for workers necessary to the COVID-19 response. A secondary effect is a sudden change in sources of revenue for transport operators, with several experiencing an unanticipated shortfall in their finances.
- The Covid-19 pandemic has made business tougher for domestic ports and logistics companies, which were already grappling with falling earnings amid the global economic slowdown, consequently impacting the sale of products and solutions based on context-aware technology and which are used in the logistic sector.

IMPACT OF COVID-19 ON THE MARKET

PLASTIC MATERIAL EXPORTS

Share (%), Hong Kong, 2017-H1'2019

	2017	2018	H1'2019
Plastic sheets, film, foil and strip	61%	61.2%	63.8%

PRODUCTION OF PLAS

In million metric ton, China, [illegible]

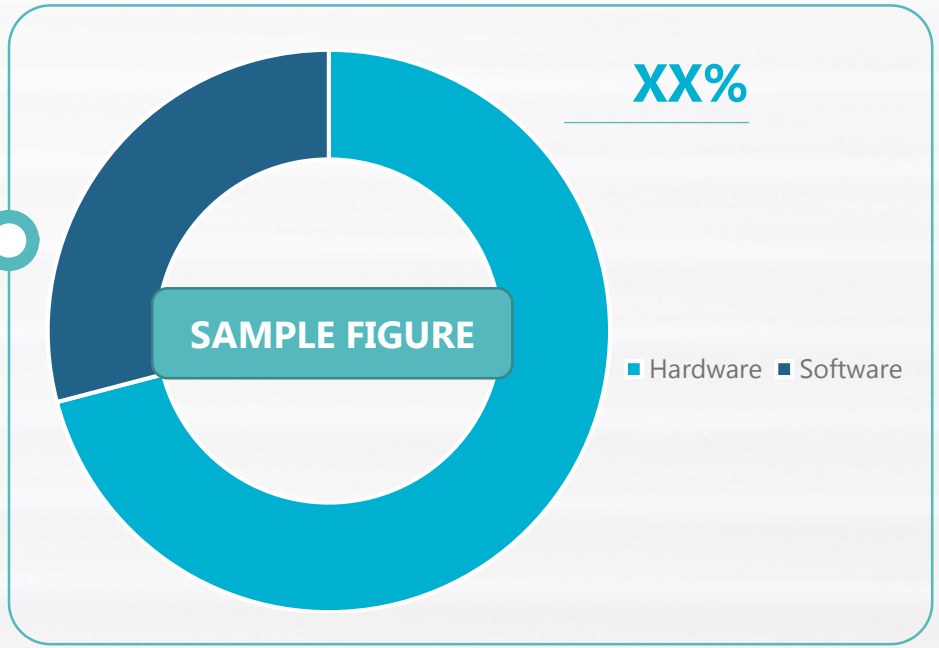
Source: National Bureau of Statistics of China

Detail Analysis Available with the Report

- The pre-COVID market scenario was indicative of a linear upsurge in demand for plastic films in general, and several market players are operating in Asia were witnessing increasing sales of graphic films.
- The demand curve peaked in January 2020, with an eventual decline in the March and April time period of the market study. Moreover, highly concentrated regions, like Europe, are also witnessing a steep nose dive in revenues. For instance, according to a survey by UK Industry Organisations & Trade Associations, across all segments, 37% of the companies stated that [illegible] of more than 20%. In contrast, a good half of the companies reported an increase in orders in April, though mostly in the range of between 10% and 20%.
- Further, according to the survey, just under 80% of the companies are able to fulfill the orders they received, but around half of the respondents reported corona-related restrictions, mainly in relation to reduced personnel number.
- However, Asia is slowly gaining traction in terms of surging sales and market activity, with an optimistic performance in May 2020. However, the short-term implications reflect a sluggish growth, mainly attributed to manufacturing shutdowns.

MARKET SEGMENTATION - BY APPLICATION MEDIUM

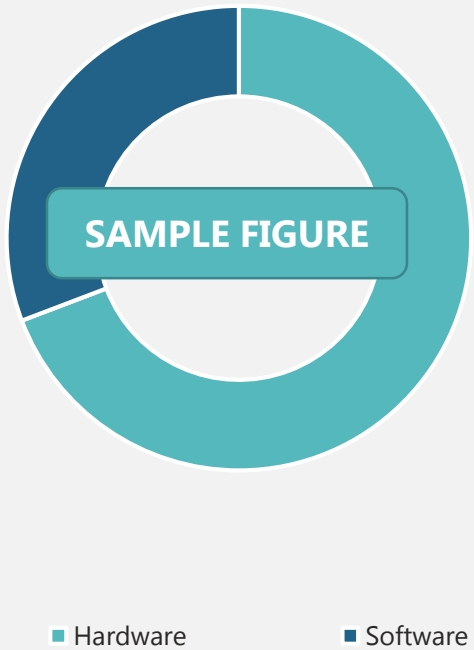
- Hardware
- Software



MARKET SEGMENTATION - BY APPLICATION MEDIUM

CONTEXT AWARE COMPUTING MARKET

Revenue Share (%), by Application Medium, Global, 2020



SOURCE: Mordor Intelligence

CONTEXT AWARE COMPUTING MARKET

Revenue in USD billion, by Application Medium, Global, 2019-2026

Application Medium	2019	2020	2021	2022	2023	2024	2025	2026	CAGR (%)
Hardware	XX	XX	XX	XX	XX	XX	XX	XX	**XX**
Software	XX	XX	XX	XX	XX	XX	XX	XX	**XX**

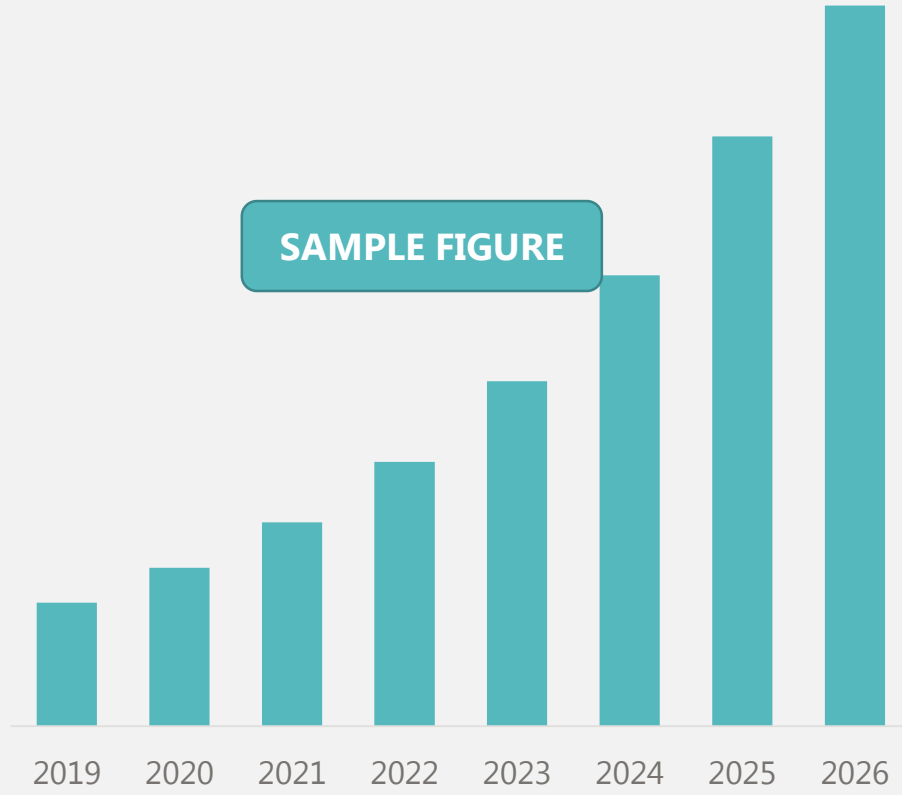
SOURCE: Mordor Intelligence

HARDWARE

- The hardware segment of the market studied is expected to hold the prominent share of the market, owing to the sheer amount of hardware components used for contextual computing in various devices, such as smartphones, wearables, automotive, and other consumer electronics.
- For instance, smartphones and smart wearables are equipped with small-scale microelectromechanical sensors that are capable of offering context-aware services to its users in mobile environments. Context-aware systems rely on the acquisition of data from a wide range of different sensors, such as accelerometer, gyroscope, video sensors, an audio sensor, location sensor, touch sensor, motion sensor, and many more.
- Almost all of the smartphones are equipped with such sensors, and the number of sensors being incorporated into the devices is also increasing with the demand. According to Ericsson, the global smartphone subscription in 2019 stood at 5.6 billion and is expected to reach 7.4 billion by 2025.
- Vendors in the market are increasingly developing solutions specific to be incorporated into smart devices, which can better sense their environment; this is developed with both single sensors and sensor-fusion solutions. For example, Infineon develops single sensors, and sensor fusion solutions with two or more complementary sensors. Its latest member of sensor portfolio is a 60 GHz mm-wave radar chip with integrated antennas that are capable of detecting micro motions and gestures, and the chip allows devices, such as smartphones, to react anticipatorily and save energy by enabling power consuming functions only when needed.
- Apart from that, the use of technology is increasingly being incorporated into smart wearables, and vendors are developing intuitive hardware solutions for collecting data and sensing. Apple's smartwatches have been incorporated with contextual awareness hardware, which the company started offering back in 2015, and Apple currently holds a prominent share of the global smartwatch market.

CONTEXT AWARE COMPUTING MARKET

Revenue in USD billion, Hardware, 2019-2026



Source: Mordor Intelligence Analysis

HARDWARE

- In addition to this, the global demand for smart home and voice-based assistant is further influencing the demand for hardware solutions, which are equipped with context awareness computing capabilities. For example, Amazon's Echo devices are equipped with context awareness hardware and recognize and respond based on the human presence. Amazon holds a prominent share of the global smart speaker market, followed by Google. According to Loup Ventures, Amazon Echo unit's shipment in 2019 stood at 42 million, whereas Google Home unit shipments stood at 20 million. With such growing demand, the demand for context-awareness hardware components in smart home solutions is expected to increase even further over the coming years.
- Owing to such growth in demand from consumer electronics and IoT space, various vendors in the market are developing intuitive solutions that are capable of enhancing human awareness. For example, in May 2019, Himax Technologies Inc. and Emza Visual Sense announced the release of their WiseEye 2.0 NB, an intelligent vision solution for notebook computers. It is one of the first ultra-low power, AI-based intelligent visual sensors that adds the advanced human presence awareness functionality for notebooks, while supporting the always-on operation.
- In order to incorporate the added context-awareness capabilities in hardware components of devices, vendors have been increasingly developing solutions that are capable of processing and optimizing applications. For example, Knowles Corporation announced the release of IA8201 from AISonic family of audio edge processors; it is capable of optimizing multi-microphone audio processing and offers robust voice activation. The processor boasts computing power to perform advanced audio output, gesture control, and context awareness. Such developments are expected to further augment the demand for innovative hardware solutions.
- Furthermore, context aware computing is providing significant number of opportunities for the electronics OEMs, ODMs, SoC manufacturers. For instance, in September 2020, CEVA Inc has introduced the Hillcrest Labs MotionEngine Hear, which is a sensor and processor agnostic embedded software solution for hearable devices. System-on-Chip vendors, OEMs and ODMs can utilize MotionEngine Hear to offer a frictionless user interface, gesture control, activity tracking and spatial audio for a range of smart personal audio devices, including TWS earbuds, audio headsets, hearing aids, and AR glasses. The MotionEngine Hear software delivers sensor-based features that are essential to these context-aware devices, while requiring sub-milliamp level power draw for the whole system.

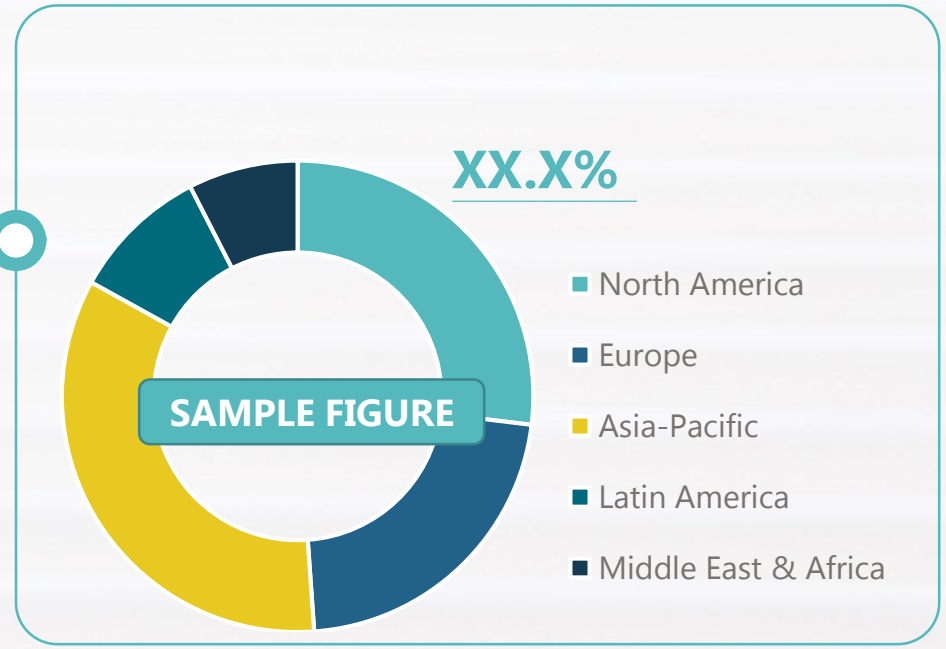
HARDWARE

- Non-destructive testing (NDT) involves inspection, testing, or evaluation of components, materials, or assemblies. NDT involves examination for disparities in characteristics or discontinuities, primarily without hampering the serviceability of the product or part.
- Re-usability of an object after inspection with little to no effect on operating performance, coupled with the right balance between quality control and cost-effectiveness, positioned NDT as a go-to solution across all end-user verticals. The factors significantly driving the growth of the market include stringent regulations mandating safety standards and rising focus on safety and maintenance of aging infrastructure.
- Non-destructive testing equipment emerged as an essential part of every industrial toolbox. Building welded structures or industrial plants without NDT would be synonymous to building without cleaning or measuring or welding. Maintaining aircraft, refineries, or rotating equipment without NDT would be like maintaining without lubrication or checking for corrosion or tightness.
- In terms of technique, ul… cremental innovations aimed at filling gaps in the exis… sting, the market for phased array ultrasonic testing is witnessing saturation, while guided wave ultrasonic testing is being dubbed as one of the most significant techniques.
- Furthermore, approximately 70%-80% of the sales of NDT, primarily related to equipment manufacturers, such as GE and Olympus, are catering to NDT service providers, such as Acuren and Applus RTD, mainly through a wide variety of distributors and local representatives, such as Inspection Technologies Inc. and Detek.
- The equipment market is largely dominated by market incumbents with greater access to R&D and expansion funds. High barriers of entry for new players and high acquisition costs are expected to affect the long term profitability in the market.
- Cost remains a major hindrance in this market, as inspection service providers are focusing on expanding their base rather than adopting new practices. High replacement costs are expected to deter the long term growth of the market studied.

Detail Analysis Available with the Report

MARKET SEGMENTATION - BY GEOGRAPHY

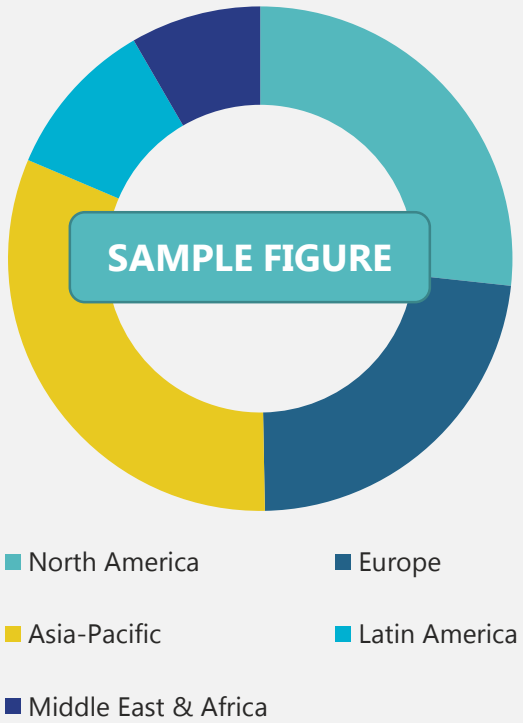
- North America
- Europe
- Asia-Pacific
- Latin America
- Middle East & Africa



MARKET SEGMENTATION - BY GEOGRAPHY

CONTEXT AWARE COMPUTING MARKET

Revenue Share (%), by Geography, Global, 2020



SOURCE: Mordor Intelligence

CONTEXT AWARE COMPUTING MARKET

Revenue in USD million, by Geography, Global, 2019-2026

Geography	2019	2020	2021	2022	2023	2024	2025	2026	CAGR (%)
North America	XX.X	XX.X	XX.X	XX.X	XX.X	XX.X	XX.X	XX.X	**XX.X**
Europe	XX.X	XX.X	XX.X	XX.X	XX.X	XX.X	XX.X	XX.X	**XX.X**
Asia-Pacific	XX.X	XX.X	XX.X	XX.X	XX.X	XX.X	XX.X	XX.X	**XX.X**
Latin America	XX.X	XX.X	XX.X	XX.X	XX.X	XX.X	XX.X	XX.X	**XX.X**
Middle East & Africa	XX.X	XX.X	XX.X	XX.X	XX.X	XX.X	XX.X	XX.X	**XX.X**

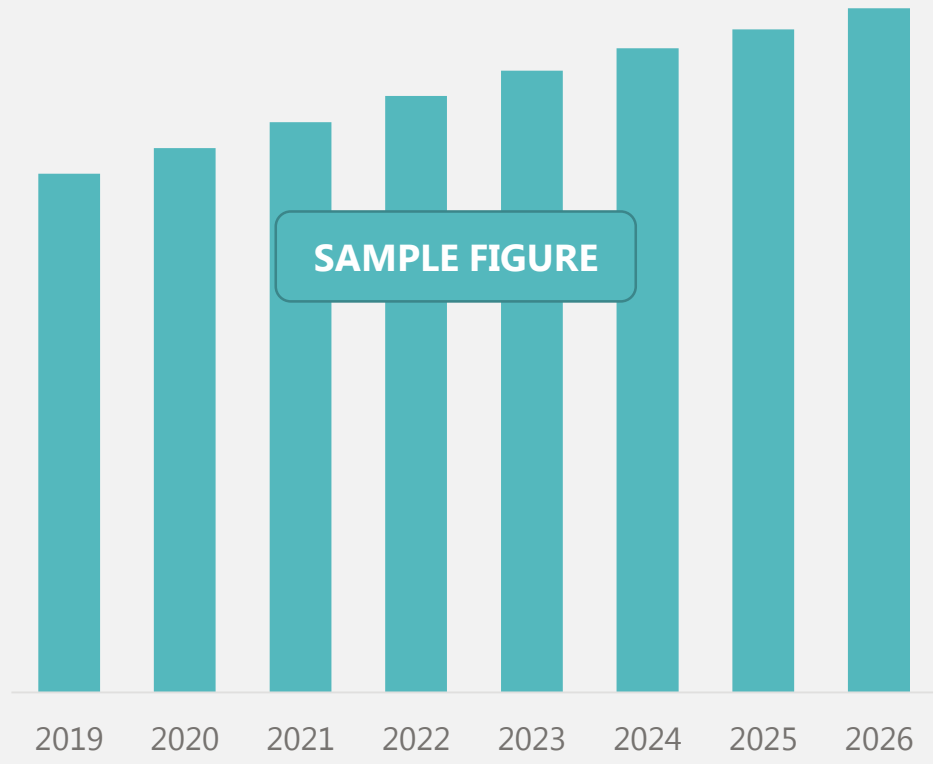
SOURCE: Mordor Intelligence

ASIA-PACIFIC

- The presence of a large number of SMEs and increasing technological penetration in the Asia-Pacific region, especially in countries, like China, India, and Vietnam, are expected to fuel the growth of the market in this region.
- The region has been witnessing a growing interest in technologies that lessen the computational burden and increase speed. Companies seeing issues regarding the calculation of neural network algorithms in deep learning, for instance, one method for achieving higher performance speeds, is to reduce the operation precision from 32 bits to 8 bits and to carry out parallel operations four times.
- In October 2019, Fujitsu Laboratories, Ltd. announced the development of new "Content-Aware Computing" technology that can control accuracy while increasing computing speeds. The technology was developed in response to the increasing demand for computing power accompanying the evolution and popularization of AI technologies. Applying this new technology to deep learning tasks promises to accelerate computing speeds by up to ten times, making it easier to utilize AI for an increasing variety of future applications.
- Further, the region has a strong market for consumer electronics, especially smartphones, tablets, and smart TVs, among others, which is expected to significantly augment the growth of the context-aware computing in the region.
- According to a recent Consumer Life Study, smartphones, feature phones, and wearables accounted for 44% of the global USD 1.2 trillion consumer electronics market in the Asia-Pacific region. The study also stated that more than 732 million smartphone devices were sold in 2018. Despite a slight decline in demand, the overall consumer spends increased by 5%.
- The significant presence of technical consumer goods manufacturing facilities in the region, owing to the broad availability and low cost of the raw material in the region is anticipated to drive the market for context-aware computing.

CONTEXT AWARE COMPUTING MARKET

Revenue in USD million, Asia-Pacific, 2019-2026



SOURCE: Mordor Intelligence

ASIA-PACIFIC

- The increasing research across the developing countries, like South Korea, to develop new context aware technologies, by the universities, has propelled the market for context aware computing. For instance, in 2019, a team of researchers at Yonsei University and Ecole Polytechnique Federale de Lausanne (EPFL) developed an architecture, CAER-Net, which is composed of two key sub-networks and encoders that independently extract facial features and contextual regions in an image. These two types of features are then coupled using adaptive fusion networks and analysed together to predict the emotions of people in a given image.
- South Korea's focus on developing AI-driven technologies is further augmenting the growth of the market studied. South Korea has published an AI strategy to become a Top 4 contender in AI by 2022, with an investment of over USD 2 billion in AI research and training. Being the home country of Samsung, South Korea has already secured this rank. Companies all across the country, including hundreds of startups, have AI technology as their offering.
- Further, the outbreak of COVID-19 in the region is anticipated to result in the reduction of the sales and manufacture of these devices, over the next one year, which might significantly impact the growth of the market. For instance, according to China Academy of Information and Communications Technology smartphone brands shipped a total of 20.4 million devices in January 2020, down by 36.6% from 32.1 million in January 2019, owing to decreasing demand for smartphones from the consumer end due to the outbreak of the pandemic in the country. Hence, it is anticipated the growth for context aware computing may decrease over the next one year in the region owing to the shutdown of manufacturing facilities across various countries in the region.

ASIA-PACIFIC

- Furthermore, a rise in the penetration of automation in the manufacturing sector and the rising need to mitigate manufacturing cost and penetration of machine to machine (M2M) technologies are encouraging the adoption of automation and, therefore cutting edge technology enabled services in the country, which is thus expected to drive the demand for EMS.
- In the automotive industry, OEMs are investing in EDA design automation, to develop the next generation of electrified, autonomous vehicles. The United Kingdom is encouraging the adoption of autonomous cars. The UK government has also funded GBP 100 million for the UK Connected Intelligence Transport Environment (UK CITE), a project to create an advanced environment for testing autonomous and connected vehicles, which include technologies, like emergency vehicle warning (EVW), road works warning (RWW), emergency electronic brake light (EEBL), and traffic condition warning (TCW).
- The rapid implementation of Industry 4.0 in the United Kingdom is a revolutionary step for the country, with wide-scale involvement for businesses, consumers, and workers. According to the Department of Industrial Strategy (BEIS), [illegible] adoption of Industry 4.0 solutions could be worth [illegible] manufacturing sector over the next decade, contributing to between 1.5% and 3% of additional annual growth.
- The COVID-19 pandemic has created an economic turmoil for small, medium, and large scale industries alike, across the United Kingdom. Adding to the woes, country lockdown inflicted by the government to minimize the spread of the virus has further resulted in industries taking a hit.
- Furthermore, amid the disruptions caused due to COVID-19 pandemic scenario, businesses are facing operational and financial challenges. Challenges such as these are expected to persist and could be augmented with new challenges in certain regions like the UK-EU trading relationship and post-Brexit regulations.
- Moreover, according to the Jaguar Land Rover, UK car factories are running out of parts, due to COVID-19. According to the SMMT, car output may fall by 18% in 2020, as a result of COVID-19 closing all major UK plants. Hence, owing to such trend, the slowdown in the automotive industry may affect the growth of the market in the country.

Detail Analysis Available with the Report

KEY VENDOR PROFILES

- IBM Corporation
- Microsoft Corporation
- Cisco Systems Inc.
- Google LLC
- Oracle Corporation
- Amazon Web Services Inc.
- Verizon Communications Inc.
- Samsung Electronics Co. Ltd
- Apple Inc.
- Intel Corp.

List Not Exhaustive

APPLE INC. - OVERVIEW

- Apple Inc. is an American company that designs, manufactures, and markets mobile communication and media devices, personal computers, and portable digital music players. It sells a variety of related software, services, accessories, networking solutions, and third-party digital content and applications.
- The company's products and services include iPhone, iPad, Mac, iPod, Apple Watch, Apple TV, a portfolio of consumer and professional software applications, iOS, macOS, watchOS, tvOS operating systems, iCloud, Apple Pay, and a variety of accessories, services, and support offerings. The company sells and delivers digital content and applications through iTunes Store, App Store, Mac App Store, TV App Store, iBook Store, and Apple Music.
- The company's customers are involved in the consumer business, small and mid-sized business, enterprise, and government markets. The company sells its products and resells third-party products in its major markets, directly to consumers, small and mid-sized businesses, enterprises, and government customers, through its retail and online stores and its direct sales force.
- The company delivers a variety of other services available in certain countries, including Apple Arcade, a game subscription service; Apple Card, a co-branded credit card; Apple News+, a subscription news and magazine service; and Apple Pay, a cashless payment service.

USD 274.51 billion Revenue

147,000 Employees

USD 57.41 billion Net Income

USD 18.75 billion R&D Expenditure

15% Revenue Growth in Asia-Pacific

Source: Apple Inc. Annual Report For the fiscal year ended September 26, 2020

Founded in 1976

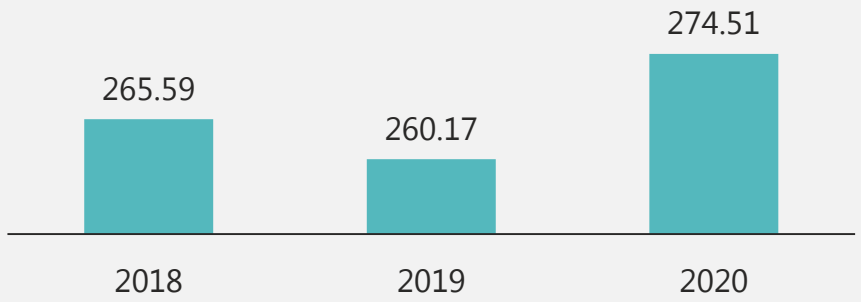
California, United States

https://www.apple.com/

+1-408-996-1010

APPLE INC.

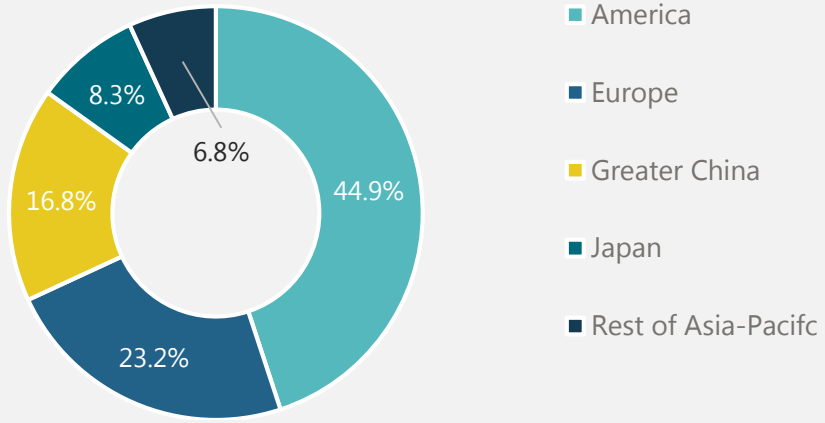
Revenue in USD billion, 2018 – 2020



APPLE INC. – BUSINESS SEGMENTS

APPLE INC.

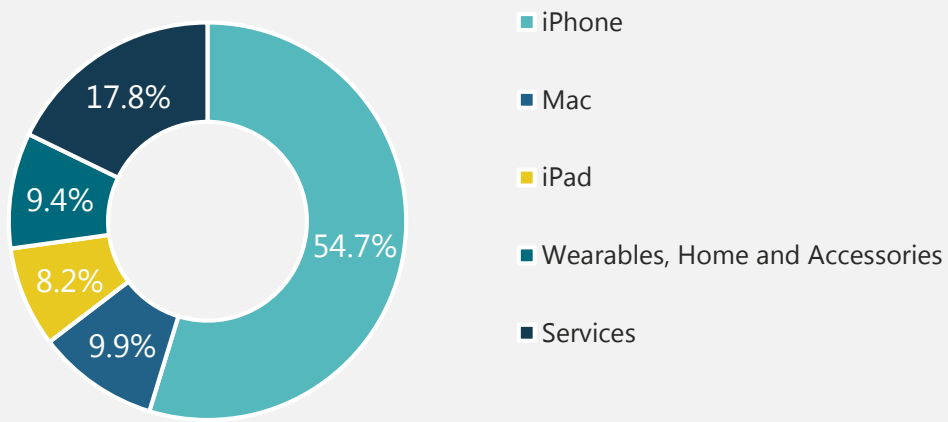
Revenue Share (%), by Geography, 2020



- Americas net sales increased during 2020 compared to 2019 due primarily to higher net sales of Services and Wearables, Home and Accessories. Europe net sales increased during 2020 compared to 2019 due primarily to higher net sales of iPhone, Wearables, Home and Accessories and Services.
- Greater China net sales decreased during 2020 compared to 2019 due primarily to lower net sales of iPhone, partially offset by higher net sales of Services and iPad.
- Japan net sales were flat during 2020 compared to 2019 due primarily to lower net sales of iPhone, offset by higher net sales of Services and Wearables, Home and Accessories. The strength of the Japanese yen relative to the U.S. dollar had a favorable impact on Japan net sales during 2020. Rest of Asia Pacific net sales increased during 2020 compared to 2019 due primarily to higher net sales of Wearables, Home and Accessories, Services and iPhone

APPLE INC.

Revenue Share (%), by Business Segment, 2020



- iPhone net sales decreased during 2020 compared to 2019 due primarily to the absence of new iPhone models in the fourth quarter of 2020 and the weakness in foreign currencies relative to the U.S. dollar, partially offset by the introduction of iPhone SE in the third quarter of 2020, whereas Mac net sales increased during 2020 compared to 2019 due primarily to higher net sales of MacBook Pro.
- iPad net sales increased during 2020 compared to 2019 due primarily to higher net sales of 10-inch versions of iPad, iPad Air and iPad Pro. Wearables, Home and Accessories net sales increased during 2020 compared to 2019 due primarily to higher net sales of AirPods and Apple Watch. Services net sales increased during 2020 compared to 2019 due primarily to higher net sales from the App Store, advertising and cloud services.

APPLE INC. - SOLUTIONS AND STRATEGIES

SOLUTIONS

Apple CarPlay

- It is a vehicle infotainment system, which displays iPhone maps and plays music from a vehicle's dashboard. One key feature is an advanced, contextually aware artificial intelligence system that aims to assist the users while they drive.
- It predicts where a user is most likely headed to, by detecting addresses in their e-mails, text messages, contacts, and calendars. Likely destinations can then be presented to the user, who can simply select one from the available options and reach their destination.

Siri

- It is an intelligent assistant that offers a faster and easier way to perform tasks on the Apple devices. It suggests shortcuts that the user might want to perform, based on their current context and the information that is provided.
- Depending on the information, the app shares the user's current context, after which Siri can offer suggestions for shortcuts on the lock screen, in the search results, or on the Siri watch face. Siri can also use some types of information to suggest actions that the apps support, such as using calendar to add an event shared by the app.

****List not exhaustive, final portfolio with a detailed analysis will be provided with the full-length report.**

STRATEGIES

- The company's business strategy leverages its unique ability to design and develop its operating systems, hardware, application software, and services, to provide its customers with products and solutions with innovative designs.
- The company spends a large part of its R&D for product innovations and has a strong international presence. It also has a strong image in the global smartphone industry, and it leverages this image to promote the other segments too.
- The company is focusing on building and expanding its retail and online stores, and its third-party distribution networks. The company continues to expand its platform, for the discovery and delivery of digital content and applications, through its Digital Content and Services division.
- In order to tackle the COVID-19 pandemic, the company released a screening tool and a set of resources, in order to help stay informed and take proper steps to protect the health during the spread of COVID-19, based on the latest CDC guidance. The users will receive answers to the frequently asked questions about COVID-19, including who is at risk and how to recognize the symptoms.

APPLE INC. - SWOT ANALYSIS

STRENGTHS

- The strong R&D capabilities, along with robust and extensive distribution channels, have aided the company's development into a strong global brand image. The company confines its customers within the ecosystem of Apple, which leads to strong brand loyalty, as compared to other companies.
- The company gains a formidable competitive advantage through its horizontal and vertical integration, and no single customer accounted for more than 10% of net sales in 2020, 2019, and 2018.

WEAKNESSES

- The company distributes its products through cellular network carriers, wholesalers, retailers, and resellers, many of whom distribute products from the competing manufacturers and depend on their performances.

OPPORTUNITIES

- The company can grow its investments in context aware computing and can incorporate it to its latest smartphones, which will leverage its market-leader position in smartphones and other relevant markets.
- The company can acquire any start-up company that solely focuses on context aware computing and can use the technology in its own ecosystem of products, given its income and brand image.

THREATS

- The markets for the company's products and services are highly competitive, and the company is confronted by aggressive competition in all the areas of its business. These markets are characterized by frequent product introductions and rapid technological advances.
- Due to the outbreak of the COVID-19 pandemic, the company's business may face retail closures and supply chain disruptions and could lead to the postponement of any new product launches, disrupting its revenue stream.

APPLE INC. - RECENT DEVELOPMENTS

M Merger and Acquisition I Product Innovation E Expansion P Partnership

Apple researchers developed an acoustic sub-model that makes predictions, based on the evidence conveyed by the speech signal, and a context aware prediction component takes into account, the assorted interaction context signals.

The context signals encompass information about the conditions under which the dictation request was made, including information about installed dictation locales, the currently selected dictation locale, and whether the user toggled the dictation locale before making the request.

I

FEB 2020

MAR 2020

I

Apple announced a new iPad Pro, along with an updated keyboard case with a trackpad. The company also confirmed that it would introduce a laptop-like trackpad and mouse functionality for the iPadOS. The new context aware cursor and other trackpad features are the part of the iPadOS 13.4 update.

RESEARCH METHODOLOGY

- Mordor Intelligence (MI) advocates an appropriate mix of secondary and primary research, to meet the clients' objectives.
- MI translates market insights (market dynamics, competition, varying consumer demands, and regulations) into actionable business insights.
- The following phases are practiced at Mordor, for efficient delivery of various syndicated and consulting assignments:

STEP 1 SCOPING/PROJECT INITIATION

- Decipher *client requirements*/market to be studied
- *Tailor-made research approach* for customized reports
- Effective use of *Mordor's knowledge repository* to gather relevant insights
- *Confirm the objectives* of the assignment with the client
- *Finalize the report's contents* and establish a deliverable format

STEP 2 MARKET ANALYSIS

- Extensive desk research to identify the most relevant secondary information available
- Contact Mordor's empaneled experts and identify industry experts across the market
- Conduct primaries and surveys to gather qualitative and quantitative insights
- Triangulate and analyze data, to finalize the actionable business insights

STEP 3 PROJECT DELIVERY

- Report delivery with high-quality market insights, competitive landscape, etc., as per the proposed contents

RESEARCH PHASES EXPLAINED

SECONDARY RESEARCH

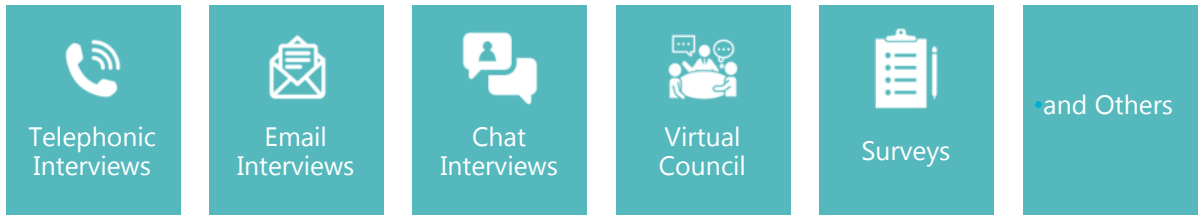
This phase involves a thorough synthesis of the existing publications across the web, to gather meaningful insights on the current situation of the market, technological developments, and any other market-related information. The sources include, but are not limited to:

- Journals, and publications.
- Industry and government websites for blogs, magazines, and other publications
- Conference proceedings and association publications.
- Investor presentations, technical brochures, annual reports, press releases, transcripts of key personnel interviews, and other strategic publications by several competitors in the market.
- Product information, including technical specifications, approvals, patents, etc.
- Context Aware Computing Device and Software vendors
- Paid sources (D&B Hoovers, Bloomberg, etc.).

PRIMARY RESEARCH

- At Mordor, we pool in industry experts across the value chain, to gather first-hand insights on the market studied. In addition, knowledgeable industry veterans or retired experts, consultants, and freelancers are a call away, to collaborate with Mordor on any assignment that requires real-time industry insights.
- We are also equipped to conduct market surveys, to gather qualitative insights and the opinions of individuals related to the industry.
- Primary research is used both to validate the data points obtained from secondary research and to fill the data gaps after secondary research. Data gathered during the primary research phase are useful to arrive at critical insights, both qualitative and quantitative; these insights can be used to ascertain the following:
  - Critical market dynamics (drivers, restraints, future, and regulations) and their impact.
  - Market distribution across various segments.
  - Market entry for new companies and insights on the competitive landscape.

MODES OF PRIMARY RESEARCH



RESEARCH PHASES EXPLAINED

DATA TRIANGULATION AND INSIGHT GENERATION

- Based on the factors (both endogenous and exogenous in nature) identified and collected during the secondary and primary phases, our in-house subject matter experts transform the quantitative data extracted and use them to infer critical insights.
- The market-size estimations are carried out through the 'bottom-up' and 'top-down' approaches.
- Our top-down and bottom-up approaches are integrated into our 'in-house model sheets', which are used to generate the market estimates and growth rates (depending on the historical trends of the respective markets, along with various factors, such as drivers, restraints, and recent developments in the market) of the product segment, in the respective country.

DATA TRIANGULATION

It is a process of combining the outcomes from different sources, to increase the validity and reliability of the results. This process also helps to strengthen conclusions about the findings and to reduce the risk of false interpretations. The insights obtained from both secondary and primary research are analyzed and validated by the process of data triangulation, to arrive at closer estimates.

ECONOMETRIC MODELING

An econometric model is a simplified representation of a real-world process. Here, the tools of econometric theory are used to analyze and forecast economic phenomenon, and to solve unknown quantities, such as forecast demand, supply, investment, production, consumption, etc.

REPORT WRITING

After the data is curated, analysts write the report. From the data and forecast, insights are drawn to visualize the entire ecosystem in a single report.

FOR MORE INFORMATION, PLEASE CONTACT

5th Floor, Rajapuspha Summit, Financial District, Hyderabad – 500008, India

+1 617-765-2493

info@mordorintelligence.com

www.mordorintelligence.com

Mordor Intelligence

Industry Reports | Consulting | Intelligence Center

+1 617 765 2493 | info@mordorintelligence.com | www.mordorintelligence.com