GEOBUIZ 23

GLOBAL GEOSPATIAL INDUSTRY MARKET SIZE, FORECAST, AND GROWTH TRENDS



TOWARDS A TRILLION DOLLAR GEOSPATIAL ECONOMY

Australia | Canada | Denmark | Finland | Germany | India
Indonesia | Japan | The Netherlands | New Zealand | Norway
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FOREWORD

The Geospatial industry has existed in a strange dichotomy. Traditionally, the geospatial industry has been easy to define, considering the technology ecosystem's segmentation and the slow pace of technology innovation. However, over the past decade, the industry has undergone many transitions - especially with the mainstreaming of geospatial technology across various economic sectors. The industry has re-shaped itself to address the world economy's rapid challenges-including rising climate risks, disasters, inflation, wastelands, depleting Agrofields and natural resources, water scarcity, and diminishing value of wealth. Though transformation has been an integral part of evolution, what's distinctly different today is the speed and dimensions of transformation - making it a 'transition.' While technological innovation and scalability of its penetration in our living are at the core of driving transition, several elements make transition inevitable, including notable changes in tenets and principles of social, economic, environmental, and geopolitical outlook, driven by conflicting and complex elasticity of pulls and pushes of globalization vis-a- vis localization.

Digital transformation is playing a critical role in redefining the geospatial industry by data profusion, evolving new business models, dynamic technology innovations, increasing embedment of digital twins and metaverse concepts across workflows, shift from descriptive analytics to prescriptive analytics (hindsight to foresight), broader industry collaboration and rising funding and investments in geospatial and space industry - to the tune of USD 202.5 billion during the period 2019-2022. Today's geospatial industry is redefined by the explosive demand for geospatial data and insights, altering the traditional role of geospatial data providers (including national geospatial agencies) and creating new business opportunities. The dramatic increase in data acquisition rates is fundamentally changing the economics of data capture and data maintenance - challenging traditional business practices. Increasing automation and managed services in change detection and predictive analytics, city-based decision support systems (3D and mobile), technology for mapping sub-surface infrastructure, digital twins, etc., drive the geospatial transition more profoundly than before.

Pursuing our mission of 'Advancing Knowledge for Sustainability' and evangelizing geospatial technology adoption and implementation worldwide across all critical sectors of the economy, Geospatial World is proud to announce the release of the **GeoBuiz 23: Global Geospatial Industry Market Size, Forecast, and Growth Trends**. The report was prepared after due deliberation and interaction with geospatial industry leaders and geospatial practitioners across 250 application sectors worldwide; the report estimates the geospatial market to be USD 512 billion in 2023, with a geospatial economy (market capitalization) of USD 1.7 trillion and direct economic impact of USD 7.5 trillion - all in 2023!

The report highlights the trends and directions of the global geospatial market, the mergers and acquisitions and partnerships trends, and the funding and investment trends in the industry. The report also highlights the direct economic impact of geospatial technology globally and sectorally. Further, the report also highlights the geospatial market across 15 countries - by their business offerings, technology sub-segment, and sectorally. The country section provides a detailed assessment of three critical sectors for each country, showcasing the current and future technology within the sectors, the current technologies adopted, the purpose of technology adoption, the benefits, challenges, and the different sectoral applications in which geospatial technology is used. Most importantly and interestingly, the report presents a Geospatial User Map -2023 for each country - presenting the top 20-25 user organizations per sector and their current adoption of geospatial technology. This, we believe, should interest the geospatial and allied industries in understanding the potential of their technology in user organizations and provide the untapped potential.

Thus, the Geospatial market is the next BIG Opportunity in the technology marketplace, wherein several mainstream IT and engineering firms added geospatial portfolios through strategic partnerships and acquisitions, especially driven by the motivation to add geospatial dimension to their existing business portfolios and preparing themselves to stay ahead of the innovation and competitive curves.

ANANYAA NARAIN
Vice President -Consulting
Geospatial World

KEY DIFFERENCES BETWEEN GEOBUIZ 22 AND GEOBUIZ 23 REPORT

The **GeoBuiz 2022: Global Geospatial Industry Outlook report**; and the **GeoBuiz 2023: Global Geospatial Industry Market Size, Forecast, and Growth Trends report** - are two separate reports, each with a unique value proposition. The GeoBuiz 2023 report **is not a mere incremental upgrade** of the GeoBuiz 2022 report but a separate report focusing on country and sectoral analysis. The report provides a much broader understanding of the geospatial industry's transition, market, and technology adoption and implementation across thirteen (13) countries and thirty-six (36) sectors.

The differences in the two reports can be well-understood from the table below -

Report Features (as per the ToC)		**GeoBuiz 2022: Global Geospatial Industry Outlook Report**	**GeoBuiz 2023: Global Geospatial Industry Market Size, Forecast and Growth Trends Report**
Global Geospatial Economic Outlook			
Geospatial Industry Definition and Value Chain	Geospatial Industry - Definition		
	GNSS and Positioning Value Chain		
	GIS and Spatial Analytics Value Chain		
	Earth Observation Value Chain		
	Sensors and Scanners Value Chain		
Geospatial Market Size and Forecast	Global		
	By Region		
	By Sub-Technology		
	By Sectors		
	By Business Offerings		
Geospatial Industry Market Map 2023			
Human Resource Map and Skillset requirements in Global Geospatial Industry			
Innovation to Impact Matrix	GNSS and Positioning		
	GIS and Spatial Analytics		
	Earth Observation		
	Sensors and Scanners		
Market and Technology Indicators	Technology Drivers		
	Market Drivers		
	Potential Threats		
	Current-Future Priorities for Businesses		
	Future of Business Model		

Mergers and Acquisitions and Partnership Trends	Purpose of M&As and Partnerships		
	M&As and Partnership Trends by Region		
	M&As and Partnership Trends by Technology Offerings		
	M&As and Partnership Trends by Business Offerings		
	Major Mergers and Acquisitions and Partnerships by Top Geospatial Companies		
Geospatial Funding and Investment Trends 2019-2022			
Geospatial Economy Indicators 2023 and 2025	Direct Economic Impact - Global		
	Direct Economic Impact - by Sub-technology		
	Direct Economic Impact by Sectors		
	Geospatial Economy - Market Valuation Map		
Geospatial Sub-Technology Market Size and Forecast and Key Highlights	GNSS and Positioning	Also includes regional information	
	GIS and Spatial Analytics	Also includes regional information	
	Earth Observation	Also includes regional information	
	Sensors and Scanners	Also includes regional information	
Geospatial Market: By Country and Sectors (13 countries and 3 sectors each)	Key Contexts for Geospatial Market		
	Geospatial Industry Growth Drivers and Differentiators		
	Sectoral Focus - Technology Adoption, challenges, benefits, and purpose of adoption		Three sectors per country
	Market Size and Forecast - by geospatial technology segment, by business offerings, and by sectors		
	Geospatial User Map 2023		75 users profiled and mapped for geospatial technology use
Research Design and Methodology			

GEOBUIZ 2022: GLOBAL GEOSPATIAL INDUSTRY OUTLOOK REPORT

OVERVIEW

The GeoBuiz 22 report brings forth the geospatial market size and forecast of geospatial technologies and their sub-segments from 2022 to 2025 for global and different regions. The report highlights the micro and macroeconomic factors affecting the growth of the global geospatial industry. The report showcases a holistic picture of human resource and skill requirements in the global geospatial industry. The report also highlights the potential economic impact of geospatial technologies on various industry verticals for 2022 and 2025 and the probable impact of public policy reforms and accelerator strategy on the geospatial market in 2030. In addition, the report brings the technology value chain and Innovation to the Impact matrix for all technology segments, which aims to provide businesses with a wide-angle view of the relative position of the major market competitors in the domain.

Key topics covered in the GeoBuiz 22:

- Global Geospatial Market Size and Forecast of Geospatial Technologies, Including Market by:
    - → Technologies (GNSS And Positioning, Earth Observation, GIS And Spatial Analytics, 3D Scanning)
    - → Regions: Europe, APAC, North America, Latin America, Middle East and Africa
    - → Sectors: 13 Sectors

- Geospatial Industry Growth Drivers and Differentiators
- Geospatial Sub-Technology Market Size and Forecast, Includes -
    - → Technology Value Chain
    - → Market By Technology Subsegments, Technology Sub Type, Technology Application, Region
    - → Applications Of Technology Across Verticals

- Innovation To Impact Matrix for Geospatial Technology Segments
- Human Resource Map and Skillset Requirements in Global Geospatial Industry
- Potential Economic Impact of Geospatial Technologies on Industry Verticals in 2022 and 2025

GEOBUIZ 2023: GLOBAL GEOSPATIAL INDUSTRY MARKET SIZE, FORECAST, AND GROWTH TRENDS REPORT

OVERVIEW

The GeoBuiz 23 report is bifurcated into two sections, one is Global, and another one is a country section with a focus on 13 geospatially developed and emerging countries.

The global section of the report brings forth an overview of the global economy and redefined geospatial industry technology value chain. The report provides the global geospatial market size and forecast by technology subsegment, sectors, and regions from 2023 to 2025. The report also brings forth a detailed analysis of Global funding and investment trends, including space, which is nowhere else available, and Mergers & acquisitions and partnerships trends. The GeoBuiz 23 report also sheds light on the economic impact of geospatial technologies on various industry verticals for 2023 and 2025, as well as the impact of geospatial technology on each technology sub-segment for both the years mentioned above.

The country section of the report is focused on 13 countries with a detailed analysis of the geospatial technology adoption of the top three sectors contributing to the countries' economies. For each country, this section brings forth the country's economic outlook and critical context for the geospatial market, which are identified based on the geospatial technology adoption in the country, as well as the macro and micro factors affecting the growth

of the geospatial industry within the country. For each sector of each country, the report provides an overview of geospatial technology adoption in the sectoral workflow and detailed market insights on geospatial technology adoption within the user ecosystem of the country.

Key topics covered in the GeoBuiz 23 report:

- Redefining The Geospatial Industry's Technology Value Chain
- Global Geospatial Market Size and Forecast of Geospatial Technologies, Including Market By:
    - → Technologies: GNSS and Positioning, Earth Observation, GIS and Spatial Analytics, Sensors and Scanners
    - → Business Offerings: Service Providers, Hardware, Software, Content, System Integrators
    - → Regions: Europe, Asia Pacific, North America
    - → Sectors: 13 Sectors
- Market And Technology Indicators Influencing the Global Geospatial Market
- Competitors Footprint Using Market Map and the Innovation to Impact Matrix
- Mergers And Acquisitions and Partnerships Trends by:
    - → Purpose
    - → Region
    - → Technology Offerings
    - → Business Offerings
- Geospatial (Including Space) Investment Trends:
    - → Investments During 2019 - 2022
    - → SPACS And IPOs
    - → Technology-Wise Funding and Investment Trends
- Geospatial Economy Indicators:
    - → Direct Economic Impact for the Years 2023, 2025, and 2030
    - → Direct Economic Impact by Sub-Geospatial Technology Segment for the years 2023 and 2025
    - → Direct Economic Impact in Sectors for the years 2023 and 2025
- In-Depth Analysis of Geospatial Market of 13 Countries, Including Country's Industry and Three Economic Sectors, based on the Following Focus Areas:
    - → Focus Countries: Australia, Canada, Germany, India, Indonesia, Japan, The Netherlands, New Zealand, Singapore, UK, USA, Vietnam, Nordic Region (Denmark, Finland, Norway, Sweden)
    - → Country's Economic Outlook
    - → Key Context for Geospatial Market
    - → Geospatial Industry Key Growth Drivers and Differentiators
    - → Top 3 Priority Sectors Based on Their Contribution to The Country's Economy, Including:
        - — Key Highlights of The Sector
        - — Geospatial Technology Adoption and Potential Across Sector's Workflow
        - — Market Insights Highlighting the Adoption Landscape
    - → Geospatial User Map (For all the Identified Sectors - Top User Organization and their Technology Adoption)
    - → Geospatial Market Size and Projection by:
        - — Technology Segment
        - — Service Offerings
        - — Sectors

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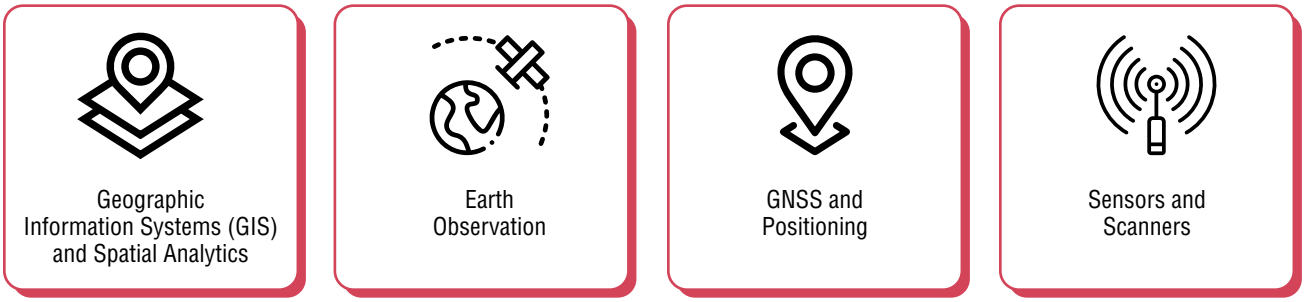
STUDY OBJECTIVE AND RESEARCH DESIGN

1 STUDY OBJECTIVE AND RESEARCH DESIGN

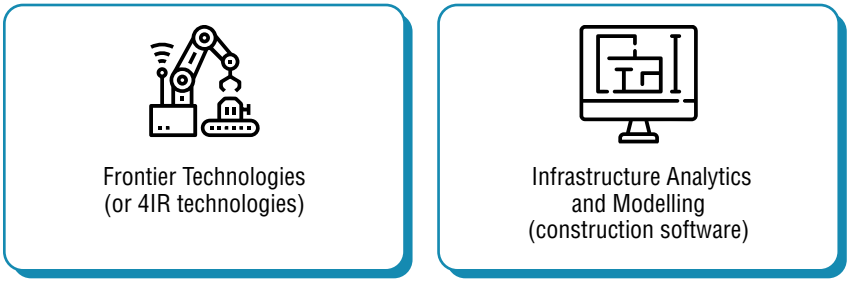
- To determine and forecast the market of geospatial technologies, its subsegments by technology sub-type, application, and region from 2019 to 2028, and analyze the various macroeconomic and microeconomic factors affecting the market growth.
- To forecast the size of the market segments for five main regions: North America, Europe, Asia-Pacific (APAC), the Middle East and Africa (MEA), and Latin America.
- To provide an in-depth analysis into the geospatial market (industry and three economic sectors) of twelve countries with an intent to provide government and businesses with demonstrable evidence of the geospatial market and economy of their country.
- To provide strategic information about the critical political, economic, social, technological, legal, and environmental (PESTLE), and business factors that will drive the geospatial industry's growth.
- To determine the socio-economic impact and return on investment of geospatial technologies and their implementation across varied economic sectors (including Architecture, Engineering and Construction, Business Intelligence, and traditional economic sectors) and regions.
- To provide detailed information about the major factors (drivers, restraints, opportunities, and challenges) that will influence the growth of the global geospatial industry and selected country's geospatial industry.
- To analyze each geospatial sub-technology, defined as GNSS and Positioning, GIS and Spatial Analytics, Earth Observation and Sensors and Scanners, for individual growth trends, prospects, and contributions to the overall geospatial technology market.
- To track and analyze policy developments, changing economic definitions, competitive developments such as mergers and acquisitions, product developments, partnerships and collaborations, research and development (R&D) activities, and funding and investment trends driving the market.

1.1 Geospatial Market: Definition

Geospatial technologies are a complex entity of multiple interactive components contributing to the geographic mapping and analysis of the Earth and human societies. These technologies have advanced significantly since the first maps were drawn in pre-historic times. In the last decade or so, particularly post-COVID-19, these technologies have evolved into a network of national security, scientific, and commercially developed applications informing decision-makers on topics such as industrial engineering, climate change, humanitarian relief, supply chain and logistics, biodiversity, etc., to name a few. As part of the GeoBuiz 23: Global Geospatial Industry Market Size, Forecast, and Growth Trends inclusive of geospatial data sourced from various technologies broadly segmented into broadly three categories -



The geospatial information collected from these sources is presented in many forms and mediums, including digital maps, satellite imagery, point clouds, and aerial imagery. The spatial data reinforces the importance of the 'location' reference frame, which facilitates societal, economic, and environmental use across government systems and services and other national development initiatives. Alternatively, to appropriately map the evolution and augmenting role of the Geospatial Industry, GW Consulting has also analysed the role of complementary technologies within the geospatial industry ecosystem inclusive of -



A broader and more detailed definition of the geospatial industry has been defined in Chapter 2 of the GeoBuiz 23 report.

1.2 Market Scope

The study provides an in-depth analysis of the global geospatial market from 2019 based on the contemporary market trends and developments and forecasts the potential growth from 2021 to 2025. The report provides exhaustive market and technology trends and developments, market size, forecasts, and a comprehensive analysis of the leading geospatial industry players.

1.3 Market Segmentation

For the GeoBuiz-23 report, the following market segmentation have been defined for analysis -

GEOSPATIAL TECHNOLOGIES

GIS and Spatial Analytics

- → GIS
- → Image and Data Analytics (Image Processing)
- → Image Analytics (Photogrammetry)

Earth Observation

- → Drones/UAVs
- → Aircrafts/Flights
- → Satellite (Upstream)
- → Satellite (Downstream)

GNSS and Positioning

- → PNT
- → Augmentation
- → Surveying

Sensors and Scanners

- → LiDAR
- → RADAR
- → GPR/EML

FRONTIER TECHNOLOGIES (4IR TECHNOLOGIES)

- → Artificial Intelligence/Machine Learning
- → Internet of Things (IoT)
- → Immersive Technology (AR/VR)
- → Autonomous Driving
- → Automation and Robotics
- → Digital Twin
- → Metaverse
- → Cloud

REGION AND COUNTRIES

North America

- → USA
- → Canada

Europe

- → Denmark
- → Finland
- → Germany
- → Netherlands
- → Norway
- → Sweden

Asia-Pacific

- → India
- → Australia
- → New Zealand
- → Japan
- → Indonesia
- → Singapore
- → Vietnam

BY BUSINESS OFFERINGS

- → OEMs (Hardware, Software, Content)
- → Service Providers
- → System Integrators
- → Reseller and Distributors

SECTORAL SEGMENTATION

Location Intelligence

- → Banking, Finance Services, and Insurance
- → Hospitality and Tourism
- → Supply Chain and Logistics
- → Retail, and Online Aggregators/E-Commerce
- → Public Mobility
- → Media, Advertising and Entertainment

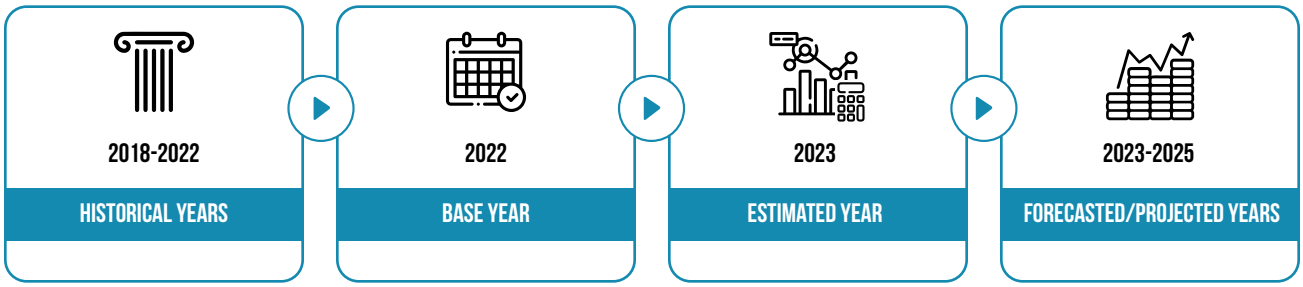
Architecture, Engineering and Construction (AEC)

- → Buildings and Campuses
- → Industrial Construction
- → Smart Cities and Digital Cities
- → Subsurface Utilities Infrastructure
- → Transport Infrastructure

Traditional Geospatial Market

- → National Geospatial Organizations
- → Agriculture and Irrigation
- → Climate and Environment
- → Defence and Intelligence
- → Disaster Management
- → Healthcare
- → Land Administration and Governance
- → Utilities (oil and gas, power, telecom, water/wastewater/ stormwater)
- → Water Resources Management
- → Public Safety and Internal Security
- → Mining
- → Natural Resources Management
- → Sustainability (including Energy)

1.4 Years Considered for the Study

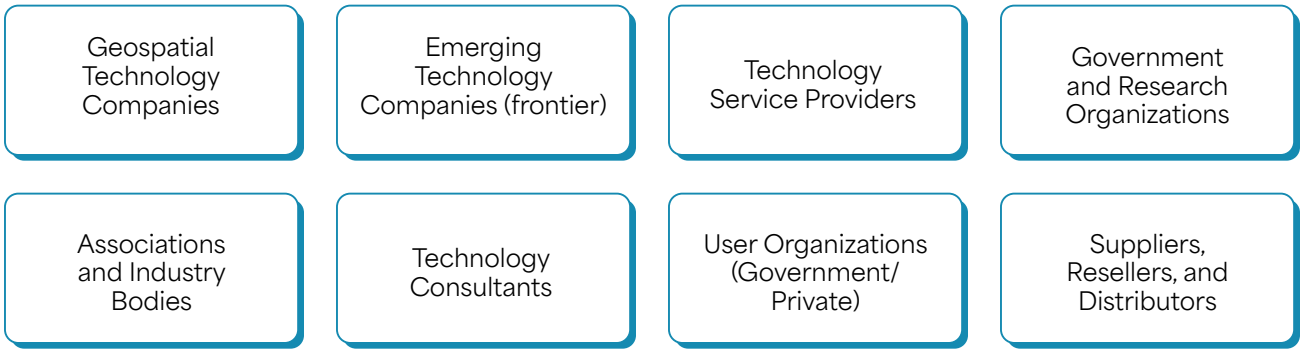


1.5 Currency Taken Into Consideration

The currency used in the report is the United States Dollar (USD), with the market size estimation and projections indicated in USD billion/million.

- Companies' revenues have been sourced from their annual reports and via interactions with the C-level executives of the companies.
- The average annual currency conversion rate was used for companies that reported their revenues in annual reports and company websites in currencies other than the USD.

1.6 Stakeholders



1.7 Summary of Changes from GeoBuiz- 2022

The previous GeoBuiz 22 - Global Geospatial Industry Outlook report was released in April 2022 and the report GeoBuiz 2023 - captures the changes that has happened over a period of a year in the geospatial technology ecosystem. During this period, the global geospatial industry has undergone some significant changes with respect to technology evolution and definition, funding and investment trends, and national priorities and needs. This year, the GeoBuiz 23 report is redefining the geospatial ecosystem and is positioning itself as the **Global Geospatial Industry Market Size, Forecast and Growth Trends report.** The report, hereto, referred to as GeoBuiz-23, brings forth the following aspects -

- The report provides a deep dive into the geospatial market (industry and three economic sectors) of twelve countries providing governments and businesses with demonstrable evidence of the geospatial market and economy of their country.

- GeoBuiz 22 report provided in-depth analysis of the sub-geospatial technology segments (defined as GIS and Spatial Analytics, Earth Observation, GNSS and Positioning, and 3D Scanning); however, this year, GeoBuiz 23 – brings forth an extended scope showcases country-specific sections aimed at unlocking national geospatial capabilities which will set out key implications, suggestions, and ambitions to spearhead the shared vision of increasing the adaptability of geospatial information and technology.

- The report includes a review of geospatial industry value chain and its sub-technology segments.

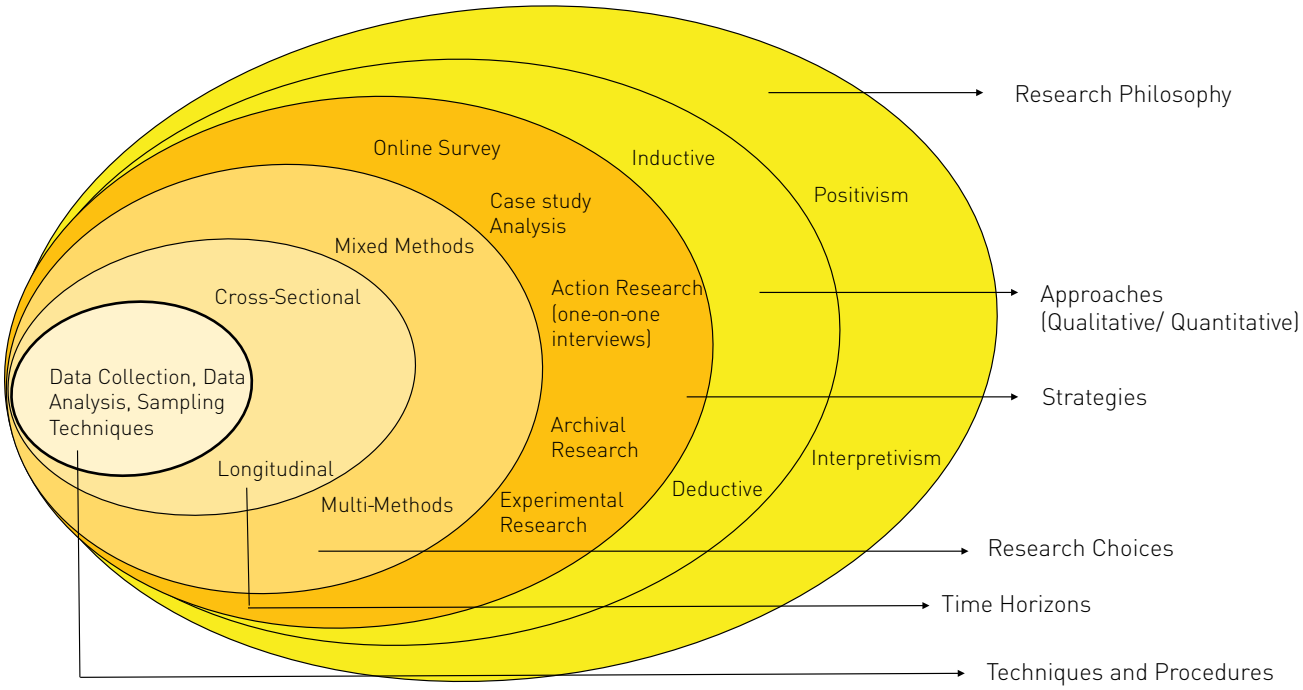
- The report also presents analysis of three priority sectors based on their contribution to the country's economy, with sectors market size and forecast and overview of geospatial technology adoption.

- The report includes a PESTLE analysis and business factors which will drive the geospatial industry's growth by 2028.

- The study also presents the socio-economic impact and return on investment of geospatial technologies and their implementation across varied economic sectors (inclusive of AEC, location Intelligence, and traditional economic sectors), regions, and economic segments.

2 RESEARCH DESIGN

The research design of the GeoBuiz-23: Global Geospatial Industry Market Size, Forecast, and Growth Trends [hereto, referred to as GeoBuiz-23] is an applied one, but not new. The research design is developed on the elusive Research Onion Model developed by Sauders, Lewis, and Thornhill in their book titled Research Methods for Business Students. The onion model symbolically illustrates how different elements involved in the research have been examined to implement the final research design.



The research design of the GeoBuiz -23 report was designed in October 2022 on two research philosophies - a **Positivism philosophy** and an **Interpretivism philosophy**. Understanding that the geospatial is ubiquitous and underpins every economic activity directly or indirectly; the research focusses on two types of research philosophies - deriving insights/data and information from what is publicly available (through secondary resources - as mentioned in References), and with the interpretivism philosophy, the GW Consulting team has drawn a holistic view of the inputs provided by the participant during action research (one-on-one interviews). Since the research is based on mixed-and multi-method research choices/approach - wherein some theories presented in the analysis of the report are built on inductive approach - wherein theories and insights are derived from the research conducted (qualitative and quantitative), while; some sections of the report are based on deductive approach, wherein a hypothesis is developed, and research is used to test it and build upon it.

The techniques and procedures (inclusive of data collection, data analysis, and sampling techniques, etc.,) used for conducting analysis and research in GeoBuiz 23 - includes a multiple strategy approach inclusive of:

The analysis presented by GW Consulting team in the GeoBuiz report, is based on the following distribution of techniques and procedures -

Online Survey

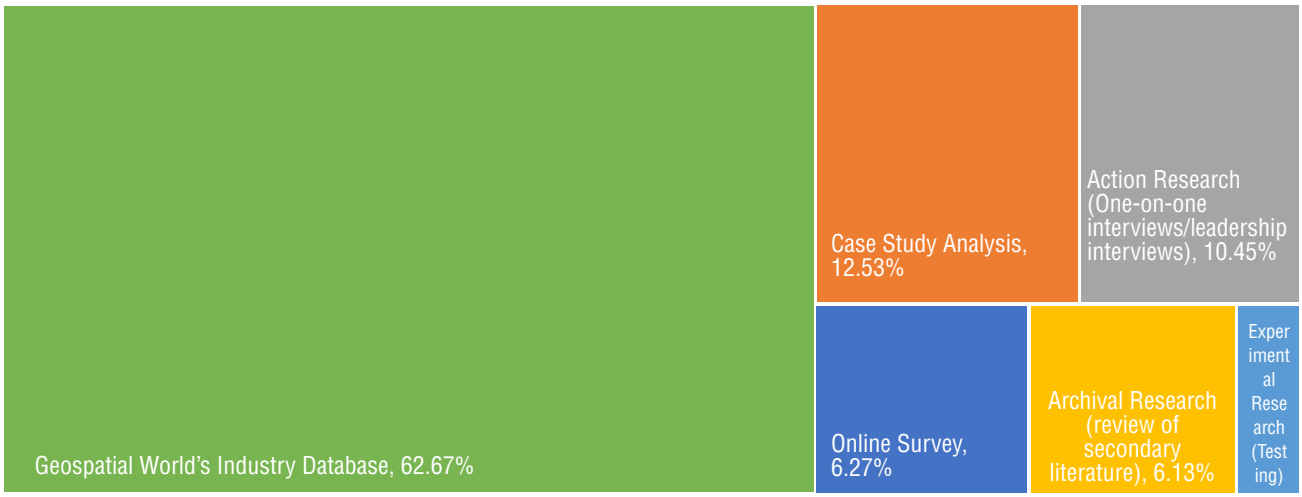
Case Study Analysis

Action Research (one-on-one interviews)

Archival Research (review of secondary literature)

Experimental Research (testing existing theories)

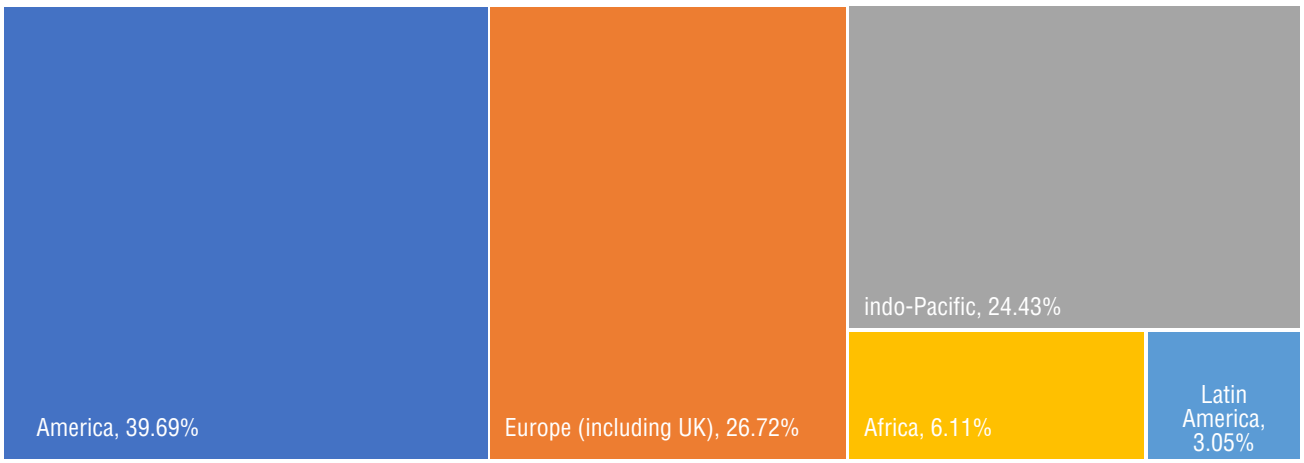
2.1 Action Research (One-on-one interviews)

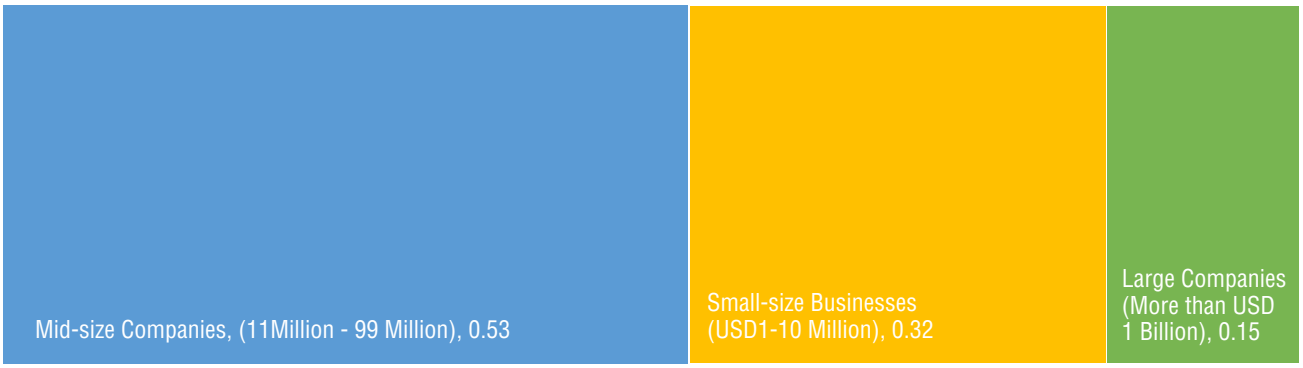


As part of the research design, GW Consulting team members, through virtual and in-person meetings at various conferences - GEOINT Symposium, Geospatial World Forum 2022, GeoBuiz Summit, GeoSmart India, etc., spoke to 200+ industry leaders (C-level executives - inclusive of CEO, CTO's, VP of Technology, etc.), 300+ industry practitioners and mapped 250+ industry leader interviews to define the geospatial industry trends and directions, technology innovations leading to commoditization and democratization of geospatial data and technologies, collaborative workflows across geospatial value chain, and business model transformations shaping the geospatial industry of the future.

2.2 Online Survey

GW Consulting conducted an online survey wherein approximately 500+ responses were collected from geospatial industry (technology providers) from across five different regions (North America, Europe, Indo-Pacific, Africa, and Latin America). The profile of respondents regionally and by type of company includes -





2.3 Archival Research and Case Study Analysis

As part of Archival Research, the GW Consulting team searched, read, and extracted information from

- Company websites (and annual reports) (at least 5000 companies),
- National geospatial agencies (for 50 countries),
- Conference proceedings of leading geospatial conferences (Geospatial World Forum, Intergeo, GeoBuiz Summit, GeoWeek 2023, GeoSmart India, Commercial UAV Expo Americas, Esri User Conference, Bentley Year in Infrastructure, GEOINT, etc., and in-house organized webinars, and virtual summits).
- Articles and newsletters from Geospatial World Magazine and resource portal, Geoawesomeness, GIS Lounge, GeoWeek etc.; and
- Analytical reports of leading consultants (McKinsey and Company, Dodge Data and Analytics, etc.).

Furthermore, the GW Consulting team also mapped 800+ press releases to map the technology trends and directions, mergers, acquisitions and partnerships, and investment and funding trends of leading geospatial companies.

As part of the research design, the GW Consulting team collated 1000+ case studies cutting across ten sectors specifically across the 12 countries selected as part of the GeoBuiz 23 report. As part of the case study analysis, both public and private sector case studies were taken into consideration and analysed for geospatial technology spend, geospatial technology adoption and maturity, and sectoral economic impact, among other things.

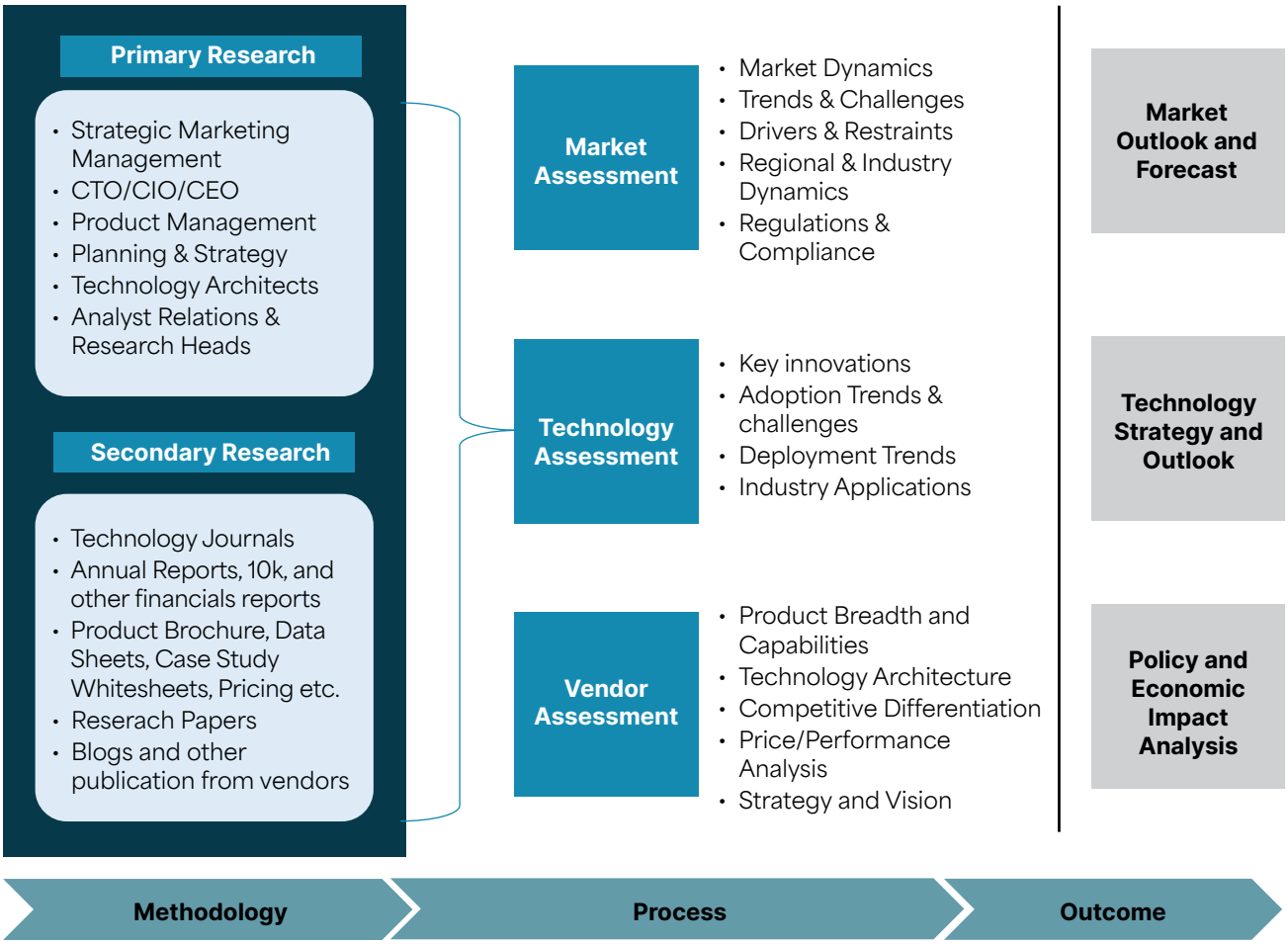
2.4 Methodology

2.4.1 Market Sizing, Distribution & Projection

To assess and estimate the global geospatial market, the market size estimations have been calculated using the top-down market sizing approach. In this approach, GW Consulting team has taken two approaches - secondary and primary approach to collate information about the geospatial industry market.

As part of the research design, the GW Consulting team looked at the geospatial industry, taking a macro view of the geospatial industry players, and their revenue across technology segments (GNSS and Positioning, GIS and Spatial Analytics, and Earth Observation); across regions (North America, Europe, Asia-Pacific, Africa, and Latin America); and across business offerings (hardware, software, and services). This information has been supplemented by primary interactions with industry leaders and further narrowed down to a section to derive the serviceable obtainable market (SAM).

For future market projections, the estimates have been extrapolated basis the technology directions projected by industry leaders for their respective segments, basis above mentioned economic factors and spending patterns of different user groups (construction and engineering, retail, supply chain and logistics, agriculture, land



administration, healthcare, defense, and intelligence, etc.). These numbers have been further supplemented and supported by archival research undertaken as part of the research design. Additionally, online survey, and action research (one-on-one research) has been used to derive the current and future technology trends.

2.4.2 Defense and Intelligence and Public Safety and Security Agencies - Market Size Estimations

To estimate and forecast the geospatial market for Defense and Intelligence and Public Safety and Security agencies - Geospatial World interacted with industry stakeholders and a few of the Defense and public safety and security organizations in the USA and Europe to estimate the actual value of the geospatial market size and forecast. As per interactions, the geospatial spend of the total market by Defense and Intelligence and Public Safety and Security organizations. The geospatial market spend is estimated to range from 8 percent to 10 percent. It is forecasted to increase in the current geopolitical situations - and expanding geospatial and space applications in the Defense and Intelligence sector and the public safety and security agencies. Thus to estimate the market size for this sector, GW Consulting calculated the global market of Defense and Intelligence and Public Safety and Security Agencies and, according to interactions provided by the industry, as well as geospatial practitioners across the sector - calculated the geospatial market for Defense and Intelligence and Public Safety and Security Agencies.

The following market size calculation has been considered for the global-regional, and sectoral markets. However, this information has not been bifurcated into the countries - and for country sections, only publicly available information for both sectors is made available, as mentioned on page 40. For this particular sector - GW Consulting can provide in-depth analysis as part of its consultancy services. Additionally for the USA Market - this information will be available in detail in the US Geospatial Market and Economy Report 2023 to be released at GeoBuiz Summit 2024.

Sector	2021	2022	2023-E	2024-F	2025-F
Defense and Intelligence	485.69	519.00	564.67	609.85	661.68
Public Safety and Security Agencies	419.00	456.00	507.98	563.86	625.89
Total market for Defense and Intelligence and Public Safety and Security Agencies - Total Market	904.69	975.00	1072.66	1173.71	1287.57
Total	90.47	97.50	105.27	115.37	125.76

*Sources: Allied Market Research, Markets and Markets, and Grandview Research

2.4.3 Geospatial Market Valuation: Towards USD 1.7 Trillion Valuation

GW Consulting's team assessed and mapped the Geospatial companies, allied technology companies - including IT, System Integrator, and Aerospace and Defense, and Engineering firms which are publicly listed and evaluated the potential contribution of geospatial technologies to their market valuation. The below ratios have been calculated from the market valuation held by publicly listed geospatial companies such as Hexagon, Trimble, Bentley Systems, etc. To estimate the valuation of privately held geospatial companies - GW Consulting used the following ratio.

Software	1:10
Hardware	1:04
Data/Content	1:0.5
Service Providers	1:0.15
System Integration Companies	1:0.25
IT and Aerospace and Defence Companies	1: 0.05 - 1:0.10

The formula for the same is - Company revenue X ratio = Market Value (Projection).
Given the above ratio and market calculation, GW Consulting estimated and created the Geospatial Market Valuation Map.

2.4.4 Policy and Economic Impact Analysis

As part of the GeoBuiz 23 report - Research Design, the GW Consulting team used publicly available research reports showcasing the impact of policies on technology development and enhancement and its further impact on the economy. GW Consulting team conducted an in-depth study of global geospatial frameworks (UN-IGIF, Geospatial Knowledge Infrastructure (GKI)), Data-related policies (Data Protection/Security, Data Governance, Data Privacy, Data Sovereignty, and Open Data), and Public-Private Partnership models. Furthermore, an in-depth evaluation was conducted of the current global economic scenario and the macroeconomic priorities of the world (clean energy transition, resilient infrastructure, climate change, and sustainable development goals, among others). Using primary interactions with the industry leaders, a multiplier effect has been defined to derive the direct economic impact of geospatial technologies and solutions in 2023, and 2028. The multiplier effect is perspective-driven and is supplemented by historical geospatial industry growth numbers, the qualitative impact of geospatial technology and solution on sectors, secondary studies of the economic effect of the four technology segments individually and together. Economic impact assessment studies for UK, Netherlands, Australia, India, etc., have been referred to supplement and support the economic impact so derived.

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