Using the Web and online resources to aid your understanding about the above organisations, classify the above organisations based on the industry and services they offer. Considering the organisations holistically, what type of data can be retrieved from the aforementioned organisations.

| **Sector / Industry** | **Organisations in your list** | **Core services / role** |
| --- | --- | --- |
| **Health / Healthcare / Public Health** | Birmingham Dental Hospital, Southampton General Hospital, National Health Service (NHS) | Provide clinical care, diagnostics, surgeries, outpatient services, patient management, public health services, medical education and research |
| **Space / Aerospace / Science Agencies** | European Space Agency (ESA), National Aeronautics and Space Administration (NASA) | Space research, satellite missions, Earth observation, scientific missions, technology development, data dissemination |
| **Banking / Finance / Banking Services** | HSBC plc, Barclay Bank plc | Retail banking, corporate banking, investment banking, loans, mortgages, deposits, payment services, wealth management |
| **Retail / E-commerce / Department Stores** | Next Plc, John Lewis | Physical retail stores, online sales, supply chain, logistics, customer service, product merchandising |
| **Real Estate / PropTech** | Rightmove, Zoopla | Property listing platforms, real estate search services, valuation, market analytics, listing services, advertisement to buyers and sellers |
| **Mapping / Geospatial / GIS / Spatial Data** | Google Maps, OpenStreetMap Foundation | Map services, geocoding, routing, map APIs, spatial databases, open map data, crowdsourced geodata |
| **Social Media / Social Networking / Digital Platforms** | Instagram, Twitter | Social networking, content sharing, user-generated content, social interaction, advertising, media delivery |

Based on the categories retrieved from the table shown above, types of data each organisation can retrieve and what can be deduced of them are:

1. **Health / Healthcare**

**Possible data types held / retrievable:**

* Patient records, clinical histories, diagnoses, treatment plans
* Demographic data (age, sex, address, socioeconomic status)
* Appointment schedules, admissions & discharge records
* Hospital resource usage: bed occupancy, staff rosters, equipment usage
* Public health statistics (infection rates, disease incidence)
* Research / clinical trial data
* Financial / billing data

**What can be deduced / inferred:**

* Patterns of disease incidence by geography, age group
* Resource bottlenecks (e.g. over‑occupied wards)
* Treatment outcomes / effectiveness comparisons
* Predictive models (e.g. risk of readmission)
* Efficiency metrics (cost per patient, turnaround times)
* Trends over time (e.g. increase in a particular diagnosis)

1. **Space / Aerospace / Science Agencies**

**Possible data types held / retrievable:**

* Satellite imagery (optical, radar, multispectral)
* Sensor / telemetry data from spacecraft
* Mission metadata (times, instrument settings, calibration)
* Astronomical catalogs (star positions, object catalogs)
* Scientific datasets (e.g. atmospheric composition, climate variables)
* Geospatial datasets (e.g. land use, elevation)
* Project, engineering, mission logs

**What can be deduced / inferred:**

* Earth changes: deforestation, urban growth, climate effects
* Environmental monitoring (ice melt, sea level, temperature)
* Predictive modeling (weather, disasters, climate)
* Astronomical discoveries (exoplanets, galaxy surveys)
* Trends in space mission technology and instrumentation
* Correlations across datasets (e.g. combining satellite + ground data)

1. **Banking / Finance**

**Possible data types held / retrievable:**

* Customer accounts, transaction records, balances
* Credit scores, risk assessments, loan histories
* Financial statements (income, assets, liabilities)
* Market data (interest rates, foreign exchange, securities)
* Customer demographics, product usage, segmentation
* Fraud detection logs, internal audit data

**What can be deduced / inferred:**

* Customer behavior (spending, saving habits)
* Creditworthiness, default risk models
* Profitability of services / product lines
* Market trends (loan demand, deposit flows)
* Fraud patterns, anomalies
* Segment-level marketing strategies

1. **Retail / E‑commerce / Department Stores**

**Possible data types held / retrievable:**

* Product catalogs, stock/inventory levels
* Sales transactions, purchase history
* Customer profiles, preferences, loyalty program data
* Supply chain / logistics data
* Online behaviour analytics (browsing, clicks, cart abandonment)
* Returns, refunds, reviews

**What can be deduced / inferred:**

* Best-selling products, inventory turnover
* Customer purchase habits, segmentation
* Demand forecasting, inventory optimisation
* Channel performance (in-store vs online)
* Consumer trends over time
* Margin / profitability analysis

1. **Real Estate / PropTech**

**Possible data types held / retrievable:**

* Property listings: location, features, price, photos
* Historical transaction records, price history
* Valuation estimates, market analytics
* User searches / behaviour logs
* Demographic / socioeconomic overlays (schools, neighbourhood)
* Alerts, saved searches, user preferences

**What can be deduced / inferred:**

* Price trends, property value growth
* Supply / demand in different regions
* Buyer preferences (e.g. features most searched)
* Market segmentation (by region, property type)
* Forecasting property price changes
* Heatmaps of desirable areas

1. **Mapping / Geospatial / GIS**

**Possible data types held / retrievable:**

* Base map data (roads, buildings, land use)
* Geocoding (address → coordinates)
* Routing / navigation data
* Elevation, terrain, satellite imagery overlays
* Points-of-interest (POIs), services, business locations
* Change datasets (edits, updates over time)

**What can be deduced / inferred:**

* Mobility patterns, traffic analysis
* Spatial clustering of services / businesses
* Access / connectivity (e.g. how well regions are connected)
* Urban planning insights
* Geographic features / terrain influence
* Trends over time (new roads, development)

1. **Social Media / Digital Platforms**

**Possible data types held / retrievable:**

* User profiles, follower/following relationships
* Posts, likes, comments, shares, engagement metrics
* Media content (images, videos)
* Temporal / activity logs (timestamps, sessions)
* Sentiment, hashtags, topic metadata
* Advertising analytics, targeting data

**What can be deduced / inferred:**

* Sentiment and public opinion on topics
* Influencer networks, community structure
* Content virality, topic trends
* User engagement patterns
* Recommendations, personalization models
* Social graph metrics

Below are three (or more) organisations in each of the sectors you had above:

| **Sector** | **Three examples** |
| --- | --- |
| Health / Healthcare | King’s College Hospital, Royal Marsden, Great Ormond Street Hospital |
| Space / Aerospace / Science Agencies | European Southern Observatory (ESO), Japan Aerospace Exploration Agency (JAXA), Indian Space Research Organisation (ISRO) |
| Banking / Finance | Barclays, Lloyds Banking Group, Citigroup |
| Retail / E‑commerce / Department Stores | Marks & Spencer, Amazon, Walmart |
| Real Estate / PropTech | Zillow, Redfin, Realtor.com |
| Mapping / Geospatial / GIS | Esri, HERE Technologies, TomTom |
| Social Media / Digital Platforms | Facebook (Meta), TikTok, LinkedIn |

Here is a comparison between examples and main organisations that were mentioned:

**HEALTH / HEALTHCARE SECTOR COMPARISON**

| **Organisation** | **Scale / Reach** | **Services Offered** | **Data Used / Held** | **Challenges / Constraints** | **Distinctive Features** |
| --- | --- | --- | --- | --- | --- |
| **Birmingham Dental Hospital** | Regional (UK) | Dental care, surgeries, teaching | Patient records, imaging, referral data | Limited to dental specialization, NHS data integration | Specialist dental hospital tied to university |
| **King’s College Hospital** | National / International | General and specialist hospital services | Medical histories, research data | Resource strain, high patient load | Renowned teaching and research hospital |
| **Great Ormond Street Hospital** | National (UK) | Paediatric services, rare diseases | Paediatric patient data, genomic data | Sensitive data, ethical handling for minors | Leading children’s hospital for rare/complex diseases |

**SPACE / AEROSPACE AGENCY COMPARISON**

| **Organisation** | **Scale / Reach** | **Services Offered** | **Data Used / Held** | **Challenges / Constraints** | **Distinctive Features** |
| --- | --- | --- | --- | --- | --- |
| **NASA** | Global | Space exploration, Earth science | Satellite data, mission telemetry | Budgeting, public data openness | Leader in open scientific space data |
| **European Space Agency (ESA)** | Continental (Europe) | Space research, Earth observation | EO data, mission records | Multi-country collaboration complexity | Copernicus & Sentinel missions |
| **ISRO (India)** | National / International | Remote sensing, satellite launch | Weather, terrain, crop data | Limited budgets, growing infrastructure | Efficient, low-cost space missions |

**BANKING / FINANCE SECTOR COMPARISON**

| **Organisation** | **Scale / Reach** | **Services Offered** | **Data Used / Held** | **Challenges / Constraints** | **Distinctive Features** |
| --- | --- | --- | --- | --- | --- |
| **HSBC** | Global | Personal, commercial & investment banking | Financial records, customer data | Fraud prevention, compliance | Strong Asian and global presence |
| **Barclays** | UK / Global | Retail banking, wealth management | Transaction & credit data | Cybersecurity, customer churn | Strong fintech partnerships |
| **Citigroup** | Global | Investment, corporate finance | Cross-border financial data | Regulatory compliance globally | Diverse global markets coverage |

**RETAIL / E‑COMMERCE COMPARISON**

| **Organisation** | **Scale / Reach** | **Services Offered** | **Data Used / Held** | **Challenges / Constraints** | **Distinctive Features** |
| --- | --- | --- | --- | --- | --- |
| **Next Plc** | UK & Europe | Fashion retail (in-store & online) | Inventory, order data | Supply chain delays, seasonal demand | Fast turnover, omni-channel retail |
| **John Lewis** | UK | Department store, furniture, tech | Purchase history, returns | Brick-and-mortar challenges | Employee-owned structure |
| **Amazon** | Global | E-commerce, logistics, cloud | Clickstreams, sales, customer data | Massive data scale, counterfeit goods | Market leader in e-commerce & data insights |

**REAL ESTATE / PROPTECH COMPARISON**

| **Organisation** | **Scale / Reach** | **Services Offered** | **Data Used / Held** | **Challenges / Constraints** | **Distinctive Features** |
| --- | --- | --- | --- | --- | --- |
| **Rightmove** | UK | Property listing portal | Listings, valuations, search patterns | Market fluctuation, outdated listings | Largest UK property platform |
| **Zoopla** | UK | Property marketplace & valuations | Market insights, mortgage tools | Accuracy of valuations | Integrated price estimation tools |
| **Zillow** | USA | Real estate listings, Zestimates | Historical sales, neighborhood data | Zestimate model criticism | Algorithmic price prediction |

**MAPPING / GEOSPATIAL COMPARISON**

| **Organisation** | **Scale / Reach** | **Services Offered** | **Data Used / Held** | **Challenges / Constraints** | **Distinctive Features** |
| --- | --- | --- | --- | --- | --- |
| **Google Maps** | Global | Maps, traffic, navigation APIs | GPS, traffic, POI data | Privacy, data freshness | Integration with Google ecosystem |
| **OpenStreetMap (OSM)** | Global (open source) | Collaborative mapping | Community map edits, geodata | Quality control, vandalism | Fully crowdsourced and open |
| **Esri (ArcGIS)** | Global (commercial) | GIS platforms and tools | Spatial databases, analytics | Licensing cost, complexity | Industry standard for professional GIS |

**SOCIAL MEDIA / DIGITAL PLATFORM COMPARISON**

| **Organisation** | **Scale / Reach** | **Services Offered** | **Data Used / Held** | **Challenges / Constraints** | **Distinctive Features** |
| --- | --- | --- | --- | --- | --- |
| **Instagram** | Global | Photo/video sharing, reels | Engagement, location, content data | Algorithm bias, content moderation | Visual-first platform with high youth usage |
| **Twitter** | Global | Microblogging, trends | Tweet text, hashtags, metadata | Misinformation, fake accounts | Real-time news dissemination |
| **LinkedIn** | Global | Professional networking | Career data, job activity | Data privacy, platform spam | Career-oriented network, job tools |