**In-house Analytics platform**

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Comprehensive Feature Matrix

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The objective of this project is to build an enterprise class in-house analytics platform that balances technical sophistication with usability, scalability, security and regulatory compliance. Outlined below is a 300-feature framework which provides a holistic solution tailored for organizations seeking full ownership, customization, and control over the data. At its core, the platform is built on a robust data ingestion framework that supports real-time and batch event collection from web, mobile, IoT, and server-side sources via scalable technologies. This complemented with advanced event tracking and instrumentation, enabling both developers and non-technical users to capture user interaction accurately through SDKs, auto-instrumentation, and visual Tag Management System (TMS). The TMS empowers marketers to deploy and manage tracking tags without developer dependency, accelerating time-to-insight while maintaining governance.

A key part of the platform is Consent and Privacy Management. It makes sure we follow laws like GDPR, CCPA, and other rules worldwide. It uses special consent controls, keeps personal info secret, checks where data stays, and handles data requests. All this helps us use data right and get ready for checks. It also has a strong Data Governance and Data Dictionary part, setting a main source for data details, path, who owns it, and how good it is, helping trust and uniformity in teams.

The platform is great at Data Processing Enrichment using third party tools to check, remove copies, and add details like where you are, your device, and session info. Data is kept in a planned way using data lakes, storage places and quick data stores to save money, work well and be easy to reach.

It also has Advanced Analytics & Reporting, with dashboards you can change, group and path analysis, multi-way attribution, and AI tips like finding odd things and guessing future trends. These come in an easy Visualization & Dashboarding part that updates in real time, lets you share, and work together.

User-focused parts like User & Session Tracking track across devices and check behaviors, while Audience Segmentation & Activation lets you make and use groups in CRM, email, and custom systems. The system is safe with Role-Based Access Control (RBAC), MFA, audit logs, and meets SOC 2/ISO 27001, keeping data safe and secret.

AI and machine learning help predict changes, suggest options, and understand spoken or written questions. A clear KPI & Success Metrics Framework lines up analytics with business goals, backing OKRs, tracking goals, and reports for bosses.

Lastly, Developer & Admin Tools keep the platform up-to-date, easy to change, and running well through APIs, SDKs, watching, and automation. Made for big growth, following rules, and staying useful over time, this platform is a key tool-bringing top-notch ease, correctness, and user feeling across the company.

Module I: Data Ingestion Framework

This module handles the secure, scalable, and reliable collection of event data from diverse sources (web, mobile, IoT, APIs) using standardized protocols. It ensures data arrives in the correct format, is validated and routed appropriately for downstream processing

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| S.No | Feature | Description | Primary Users |
| 1.1 | Multi-Source Event Ingestion API | RESTful and gRPC endpoints to accept events from web, mobile, server-side, and IoT devices | Developers, DevOps |
| 1.2 | SDK Auto-Configuration | SDKs dynamically fetch tracking configurations from the server to reduce manual updates | Developers |
| 1.3 | Real-Time Streaming via Kafka/Kinesis | Ingest high-volume event streams using distributed message queues for fault-tolerant delivery | Data Engineers |
| 1.4 | Batch Upload Support | Allow upload of historical or offline event data via CSV/JSON files | Data Analysts |
| 1.5 | Schema Validation at Ingestion | Validate incoming events against predefined tracking plans using JSON Schema or Protobuf | Data Engineers |
| 1.6 | Payload Size Optimization | Compress and chunk large event payloads to reduce bandwidth and latency | Developers |
| 1.7 | Ingestion Rate Limiting | Prevent abuse or overload by enforcing per-client or per-project rate limits | Security, DevOps |
| 1.8 | Retry & Dead Letter Queue (DLQ) Handling | Automatically retry failed events; route irrecoverable events to DLQ for inspection | Data Engineers |
| 1.9 | Ingestion Latency Monitoring | Real-time dashboard showing end-to-end latency from client to warehouse | DevOps |
| 1.1 | Cross-Origin Resource Sharing (CORS) Support | Securely allow tracking from multiple domains without compromising security | Developers |
| 1.11 | Server-Side Tracking Gateway | Proxy for backend-to-backend event forwarding with authentication and encryption | Backend Developers |
| 1.12 | Device Fingerprinting for Anomaly Detection | Capture device metadata to detect bots or spoofed traffic | Security Analysts |
| 1.13 | Client-Side SDK Health Telemetry | SDKs report internal errors, dropped events, and performance metrics | QA, DevOps |
| 1.14 | Ingestion Pipeline Auto-Scaling | Automatically scale ingestion workers based on load using Kubernetes or Lambda | DevOps |
| 1.15 | Geo-Distributed Ingestion Endpoints | Deploy ingestion APIs in multiple regions to reduce latency | DevOps |
| 1.16 | Event Deduplication by Unique ID | Detect and remove duplicate events using client-generated IDs and timestamps | Data Engineers |
| 1.17 | Ingestion Cost Attribution | Tag data by source/project for cost tracking and billing | Finance, Admins |
| 1.18 | Ingestion Throttling with Backpressure | Handle bursts gracefully by signaling clients to slow down | DevOps |
| 1.19 | Ingestion Pipeline Health Dashboard | Visualize status, throughput, errors, and bottlenecks across ingestion layers | DevOps |
| 1.2 | Zero-Downtime Schema Evolution | Allow schema changes without breaking existing clients via backward compatibility | Data Architects |

Module II: Event Tracking and Instrumentation

This module focuses on capturing user interactions across digital touch points with precision, flexibility, and minimal developer overhead. It supports declarative tracking, auto-instrumentation, and semantic event modeling.

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| S.No | Feature | Description | Primary Users |
| 2.1 | Auto-Event Capture (Clicks, Scrolls, Forms) | Automatically track common UI interactions without manual tagging | Analysts, Marketers |
| 2.2 | Custom Event Definition UI | No-code interface to define new event types and properties | Analysts |
| 2.3 | Semantic Event Taxonomy | Predefined event categories (e.g., “Product View”, “Checkout Start”) for consistency | Analysts |
| 2.4 | Dynamic Event Sampling | Sample events (e.g., 10%) to reduce volume while preserving statistical validity | Data Engineers |
| 2.5 | Client-Side SDK Debug Mode | Console logging and visual overlays to verify tracking accuracy | Developers |
| 2.6 | Server-Side Event Emulation | Simulate events for testing without live user traffic | QA Engineers |
| 2.7 | Clickstream Replay Capability | Reconstruct user journeys from raw events for debugging | Support, QA |
| 2.8 | Virtual Pageview Tracking | Track SPAs and dynamic content changes as pageviews | Developers |
| 2.9 | Video Engagement Tracking (Play, Pause, % Watched) | Monitor media consumption behavior | Product Managers |
| 2.1 | Scroll Depth Monitoring | Measure how far users scroll on a page | Marketers |
| 2.11 | Form Abandonment Detection | Identify when users start but don’t submit forms | UX Designers |
| 2.12 | Outbound Link & Download Tracking | Capture clicks on external links and file downloads | Marketers |
| 2.13 | Heatmap Overlay Generation | Generate visual heatmaps from click and scroll data | UX Designers |
| 2.14 | Touch & Gesture Tracking (Mobile) | Capture swipes, pinches, and taps on mobile apps | Mobile Developers |
| 2.15 | Error & Exception Tracking | Capture JavaScript errors and app crashes with context | Developers |
| 2.16 | Performance Timing Capture (FID, LCP, CLS) | Collect Core Web Vitals for UX analysis | DevOps, Product |
| 2.17 | Campaign Attribution Tagging (UTM, Referrer) | Automatically extract marketing campaign parameters | Marketers |
| 2.18 | Custom Context Injection | Allow developers to attach metadata (e.g., user tier, promo code) to events | Developers |
| 2.19 | Event Versioning & Deprecation | Manage lifecycle of event types with version control and deprecation warnings | Data Architects |
| 2.2 | Tracking Plan Enforcement | Ensure only approved events are sent, based on project-specific schema | Compliance, Admins |

Module 3: Tag Management System (TMS)

This module provides a no-code interface for non-technical users to deploy, manage, and audit tracking tags across websites and apps, reducing dependency on developers and improving agility

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| S.No | Feature | Description | Primary Users |
| 3.1 | Visual Tag Editor | Drag-and-drop interface to create and configure tracking tags | Marketers |
| 3.2 | Trigger-Based Tag Firing | Fire tags based on page URL, DOM elements, or custom JavaScript conditions | Marketers |
| 3.3 | Version Control for Tag Configurations | Track changes, roll back, and compare tag configurations over time | Admins |
| 3.4 | Tag Approval Workflow | Require review before deploying tags to production | Compliance |
| 3.5 | Preview & Debug Mode | Test tag behavior in staging before publishing | Marketers |
| 3.6 | Cross-Domain Tag Deployment | Deploy tags across multiple domains with shared configuration | Marketers |
| 3.7 | Built-in Templates for Common Vendors | Pre-built connectors for Facebook Pixel, Google Ads, etc. | Marketers |
| 3.8 | Tag Load Performance Optimization | Minimize impact on page speed using async loading and bundling | DevOps |
| 3.9 | Tag Conflict Detection | Identify overlapping or redundant tags that may skew data | Analysts |
| 3.1 | Tag Usage Analytics | Report on which tags are active, how often they fire, and their impact | Admins |
| 3.11 | Role-Based Tag Access | Restrict tag creation/editing by team or permission level | Admins |
| 3.12 | Tag Deployment Scheduling | Schedule tag activation/deactivation for campaigns | Marketers |
| 3.13 | API for Programmatic Tag Management | Automate tag deployment via CI/CD pipelines | DevOps |
| 3.14 | Tag Health Monitoring | Alert on tags failing to load or firing incorrectly | DevOps |
| 3.15 | Consent-Aware Tag Firing | Only fire tags when user consent is granted for that purpose | Compliance |
| 3.16 | Container Export/Import | Migrate tag configurations between environments (dev → prod) | Admins |
| 3.17 | Environment-Specific Tagging | Apply different tags in staging vs. production | Developers |
| 3.18 | Tag Impact Simulation | Predict data impact before deploying new tags | Analysts |
| 3.19 | Dependency Mapping Between Tags | Visualize which tags rely on others (e.g., GTM → GA4) | Admins |
| 3.2 | Audit Trail for Tag Changes | Log who changed what and when for compliance | Compliance |

Module IV: Consent and Privacy Management

This module ensures compliance with GDPR, CCPA, LGPD, and other privacy laws by managing user consent, enabling opt-in/out, and anonymizing sensitive data.

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| S.No | Feature | Description | Primary Users |
| 4.1 | Consent Banner Builder | No-code UI to design and deploy cookie banners with granular controls | Legal, Marketers |
| 4.2 | Granular Consent Categories (Analytics, Ads, etc.) | Allow users to opt in/out per purpose | End Users |
| 4.3 | Consent Logging & Audit Trail | Store encrypted consent records with timestamp and version | Compliance |
| 4.4 | Consent Sync Across Devices | Reuse consent decisions when users switch devices | End Users |
| 4.5 | Right to Erasure (DSAR) Automation | Automate data deletion upon user request | Compliance |
| 4.6 | PII Masking in Logs | Automatically redact email, IP, phone from raw event streams | Security |
| 4.7 | IP Anonymization (e.g., truncate last octet) | Comply with GDPR by not storing full IP addresses | Security |
| 4.8 | Data Residency Controls | Enforce storage of EU data in EU regions | Compliance |
| 4.9 | Do Not Track (DNT) Header Respect | Honor browser-level privacy signals | Security |
| 4.1 | Consent Expiry & Renewal Reminders | Prompt users to renew consent after policy updates | Legal |
| 4.11 | Third-Party Vendor Consent Verification | Validate that partners also comply with consent rules | Compliance |
| 4.12 | Automated Data Minimization | Drop unnecessary fields at ingestion based on policy | Data Engineers |
| 4.13 | Privacy Policy Versioning | Track and display which policy version a user accepted | Legal |
| 4.14 | Consent API for External Systems | Allow CRM or email tools to query consent status | Developers |
| 4.15 | Behavioral Analytics Without PII | Enable analysis using only anonymized identifiers | Analysts |
| 4.16 | Data Transfer Impact Assessment (SCCs) Tool | Document cross-border data flows for compliance | Legal |
| 4.17 | Cookieless Tracking Fallback | Use alternative identifiers (e.g., fingerprinting) when cookies are blocked | Developers |
| 4.18 | Consent-Driven Data Routing | Route data only to systems where consent is granted | Data Engineers |
| 4.19 | Privacy Dashboard for End Users | Let users view and manage their data and consent | End Users |
| 4.2 | Automated Compliance Reporting | Generate reports for regulators (e.g., GDPR Art 30) | Compliance |

Module V: Data Processing and Enrichment

This module transforms raw event data into structured, enriched, and analyzable formats using real-time and batch pipelines.

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| S.No | Feature | Description | Primary Users |
| 5.1 | Real-Time Stream Processing (Flink/Spark) | Process events in milliseconds for live dashboards | Data Engineers |
| 5.2 | Batch Processing Orchestration (Airflow) | Schedule ETL jobs for daily aggregations | Data Engineers |
| 5.3 | Geolocation Enrichment (IP → City/Country) | Add geographic context to events | Analysts |
| 5.4 | User Agent Parsing (Device, OS, Browser) | Extract device details from HTTP headers | Analysts |
| 5.5 | UTM Parameter Normalization | Clean and standardize campaign tags | Marketers |
| 5.6 | Session Stitching Across Devices | Link events from same user across devices | Data Scientists |
| 5.7 | Bot & Spider Filtering | Remove non-human traffic using known lists | Analysts |
| 5.8 | Data Type Coercion & Cleaning | Convert strings to numbers, handle nulls consistently | Data Engineers |
| 5.9 | Time Zone Normalization | Convert timestamps to UTC or user local time | Analysts |
| 5.1 | Event Sequencing & Ordering | Reorder out-of-sequence events using client clocks | Data Engineers |
| 5.11 | Derived Metric Calculation (e.g., Session Duration) | Compute high-level metrics during processing | Analysts |
| 5.12 | Data Lineage Tracking | Trace transformations from raw to processed layers | Data Governance |
| 5.13 | Schema Evolution Handling | Adapt to new event fields without breaking pipelines | Data Engineers |
| 5.14 | Data Quality Scoring | Assign health scores to datasets based on completeness | Data Stewards |
| 5.15 | Anomaly Detection in Pipeline | Alert on sudden drops in volume or schema drift | DevOps |
| 5.16 | Incremental Processing (Change Data Capture) | Only process new/changed data for efficiency | Data Engineers |
| 5.17 | Data Deduplication at Processing Layer | Remove duplicates missed at ingestion | Data Engineers |
| 5.18 | Look-Up Table Enrichment (e.g., Product Catalog) | Join events with reference data | Analysts |
| 5.19 | Language & Locale Detection | Infer user language from browser or content | Product |
| 5.2 | Processing Pipeline Versioning | Track which code version processed each dataset | Data Engineers |

Module VI: Data Storage and Management

This module provides scalable, secure, and performant storage for raw, processed, and aggregated data using data lakes, warehouses and real-time databases.

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| S.No | Feature | Description | Primary Users |
| 6.1 | Raw Data Lake (S3/Delta Lake) | Immutable storage of all incoming events | Data Engineers |
| 6.2 | Processed Data Warehouse (Snowflake/BigQuery) | Optimized storage for analytics queries | Analysts |
| 6.3 | Real-Time OLAP Store (Druid/ClickHouse) | Fast queries for dashboards and APIs | DevOps |
| 6.4 | Columnar Storage Format (Parquet/ORC) | Efficient compression and query performance | Data Engineers |
| 6.5 | Partitioning by Time & Tenant | Improve query speed and multi-tenancy isolation | Data Engineers |
| 6.6 | Data Encryption at Rest & Transit | AES-256 encryption for all stored data | Security |
| 6.7 | Immutable Audit Logs | Tamper-proof logs of all data access and changes | Compliance |
| 6.8 | Tiered Storage (Hot/Warm/Cold) | Move old data to cheaper storage (e.g., Glacier) | Finance |
| 6.9 | Data Retention Policies (Configurable) | Automatically delete data after set period | Compliance |
| 6.1 | Logical Data Isolation by Tenant | Support multi-tenant SaaS deployments securely | Admins |
| 6.11 | Backup & Disaster Recovery | Automated backups with point-in-time restore | DevOps |
| 6.12 | Data Sharding for Scale | Distribute data across clusters for high throughput | Data Engineers |
| 6.13 | Indexing for High-Cardinality Fields | Speed up queries on user IDs, sessions | Data Engineers |
| 6.14 | Materialized View Support | Precompute aggregations for faster reporting | Analysts |
| 6.15 | Storage Cost Monitoring by Project | Track and allocate storage costs | Finance |
| 6.16 | Data Snapshots for Reproducibility | Save point-in-time copies for testing/research | Data Scientists |
| 6.17 | Cross-Region Replication | Ensure availability and compliance with data laws | DevOps |
| 6.18 | Storage Quotas & Alerts | Prevent runaway costs with usage limits | Admins |
| 6.19 | Cold Data Query Acceleration | Use caching or indexing to speed up archived data access | Analysts |
| 6.2 | Storage API for External Access | Allow secure external systems to query data | Developers |

Module V: Analytics and Reporting Engine

This module provides core analytical capabilities including pre-built reports, custom queries, cohort analysis, and attribution modeling.

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| S.No | Feature | Description | Primary Users |
| 7.1 | Real-Time Traffic Dashboard | Live view of active users, pageviews, events | Marketers |
| 7.2 | Custom Report Builder (Drag & Drop) | Build reports without SQL | Analysts |
| 7.3 | Cohort Retention Analysis | Track how user groups retain over time | Product |
| 7.4 | Funnel Conversion Visualization | Map drop-off points in user journeys | UX |
| 7.5 | Path Analysis (Behavior Flow) | Visualize common navigation sequences | Product |
| 7.6 | Multi-Touch Attribution Modeling | Assign credit across touchpoints (linear, time decay) | Marketers |
| 7.7 | A/B Test Outcome Reporting | Link experiment groups to conversion metrics | Product |
| 7.8 | Segmentation in Reports | Filter data by user traits, behavior, or demographics | Analysts |
| 7.9 | Comparative Analysis (YoY, MoM) | Compare metrics across time periods | Executives |
| 7.1 | Anomaly Detection in Metrics | Flag unusual spikes/drops using statistical models | Analysts |
| 7.11 | Forecasting (Time Series) | Predict future trends using ARIMA or ML | Analysts |
| 7.12 | Dimension Drilling (e.g., Country → City) | Navigate hierarchical data | Analysts |
| 7.13 | Saved Reports & Templates | Reuse common reports across teams | Analysts |
| 7.14 | Report Versioning | Track changes and restore previous versions | Analysts |
| 7.15 | Report Scheduling & Export | Automate PDF/CSV delivery | Executives |
| 7.16 | Report Commenting & Collaboration | Discuss insights within reports | Teams |
| 7.17 | Natural Language Query (NLQ) | Ask questions in plain English (e.g., “Show signups last week”) | Business Users |
| 7.18 | AI-Powered Insight Generation | Auto-detect trends and surface insights | Analysts |
| 7.19 | Query Performance Optimization | Use caching, indexing, and pushdowns | Data Engineers |
| 7.2 | Report Access Control | Restrict reports by role or team | Admins |

Module VIII: User and Session Tracking

This module accurately identifies users across sessions and devices, enabling personalized experiences and accurate behavioral analysis

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| S.No | Feature | Description | Primary Users |
| 8.1 | Anonymous User Identification (UUID) | Assign unique IDs to unauthenticated users | Developers |
| 8.2 | Authenticated User Stitching | Link anonymous and logged-in behavior | Data Scientists |
| 8.3 | Cross-Device Identity Resolution | Use deterministic (login) or probabilistic (fingerprint) methods | Data Scientists |
| 8.4 | Session Timeout Configuration | Define inactivity thresholds (e.g., 30 min) | Analysts |
| 8.5 | Session Campaign Attribution | Track which campaign started a session | Marketers |
| 8.6 | Session Replay (Privacy-Safe) | Reconstruct user sessions with PII redacted | Support |
| 8.7 | Lifetime Value (LTV) Calculation | Estimate user value over time | Product |
| 8.8 | Engagement Scoring (e.g., 1–100) | Quantify user activity level | Marketers |
| 8.9 | First-Touch & Last-Touch User Events | Identify initial and recent interactions | Analysts |
| 8.1 | User Property Management (e.g., plan, country) | Store and update user attributes | Developers |
| 8.11 | User Timeline View | Chronological log of all user actions | Support |
| 8.12 | Device Graph Management | Map devices to users | Data Scientists |
| 8.13 | Session Context Enrichment | Add geo, device, campaign data to session records | Analysts |
| 8.14 | Bounce Rate Calculation | Identify single-page sessions | Marketers |
| 8.15 | Time-on-Page Estimation | Calculate duration between events | Analysts |
| 8.16 | Session Export API | Extract session data for external analysis | Developers |
| 8.17 | User Merge/Split Tools | Correct identity misalignments manually | Data Stewards |
| 8.18 | Active User Counting (DAU/MAU) | Standard metrics for engagement | Executives |
| 8.19 | Churn Prediction (ML-Based) | Flag at-risk users using behavioral patterns | Product |
| 8.2 | User Journey Timeline Visualization | Interactive timeline of cross-channel behavior | Product |

Module IX: Visualization and Dashboarding

This module provides interactive, customizable dashboards that enable real-time monitoring and data exploration

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| --- | --- | --- | --- |
| S.No | Feature | Description | Primary Users |
| 9.1 | Drag-and-Drop Dashboard Builder | Create dashboards without coding | Analysts |
| 9.2 | Real-Time Data Updates | Dashboards refresh automatically as new data arrives | Executives |
| 9.3 | Custom Chart Types (Bar, Line, Funnel, Heatmap) | Support diverse visualization needs | Analysts |
| 9.4 | Dashboard Themes & Branding | Apply company logos and colors | Admins |
| 9.5 | Dashboard Sharing & Embedding | Share via link or embed in internal tools | Teams |
| 9.6 | Responsive Design (Mobile/Tablet) | Optimize dashboards for all devices | All Users |
| 9.7 | Dashboard Versioning | Track changes and roll back | Analysts |
| 9.8 | Widget-Level Permissions | Control who sees each component | Admins |
| 9.9 | Full-Screen Kiosk Mode | Display dashboards on office monitors | Executives |
| 9.1 | Data Drill-Through | Click chart elements to see underlying data | Analysts |
| 9.11 | Dashboard Export (PDF, PNG, CSV) | Share static copies | Executives |
| 9.12 | Scheduled Dashboard Delivery | Email dashboards daily/weekly | Executives |
| 9.13 | Annotation Layer | Add notes or events to timelines | Analysts |
| 9.14 | Multi-Panel Layouts | Arrange widgets freely | Analysts |
| 9.15 | Dashboard Health Monitoring | Alert if data is stale or missing | DevOps |
| 9.16 | Template Gallery | Reuse dashboard designs across teams | Analysts |
| 9.17 | Dark Mode Support | Reduce eye strain in low-light environments | All Users |
| 9.18 | Accessibility (Screen Reader, Keyboard Nav) | Comply with WCAG standards | All Users |
| 9.19 | Live Collaboration (Multi-User Editing) | Multiple users edit dashboards simultaneously | Teams |
| 9.2 | Dashboard Performance Optimization | Lazy load, caching, and efficient rendering | DevOps |

Module X: Audience Segmentation and Activation

This module create dynamic user segments and activate them in external systems for marketing, personalization or analysis

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| S.No | Feature | Description | Primary Users |
| 0.1 | Rule-Based Segment Builder | Define segments using AND/OR logic (e.g., “Clicked X and not Y”) | Marketers |
| 10.2 | Behavioral Cohorts (e.g., “Watched Video >50%”) | Target based on actions | Marketers |
| 10.3 | Predictive Segments (e.g., “Likely to Churn”) | Use ML to identify high-risk users | Product |
| 10.4 | Real-Time Segment Updates | Segments refresh as users act | Marketers |
| 10.5 | Segment Overlap Analysis | Visualize intersections between groups | Analysts |
| 10.6 | Segment Export to CRM (Salesforce, HubSpot) | Sync audiences for outreach | Marketers |
| 10.7 | Segment Activation in Email Platforms (Mailchimp) | Trigger campaigns | Marketers |
| 10.8 | API for Segment Querying | External systems fetch segment membership | Developers |
| 10.9 | Lookalike Audience Generation | Find users similar to high-value customers | Marketers |
| 10.1 | Segment Size Estimation | Preview audience size before activation | Marketers |
| 10.11 | Segment Performance Tracking | Measure conversion rates of activated segments | Marketers |
| 10.12 | GDPR-Compliant Export Controls | Ensure only consented users are exported | Compliance |
| 10.13 | Dynamic List Refresh Frequency | Set how often segments sync externally | Marketers |
| 10.14 | Segment Versioning | Track changes and compare versions | Analysts |
| 10.15 | Segment Health Monitoring | Alert on sudden drops in size or quality | DevOps |
| 10.16 | Personalization Rule Engine | Use segments to trigger content changes | Product |
| 10.17 | A/B Test Audience Assignment | Assign users to experiments based on segments | Product |
| 10.18 | Segment Naming & Documentation | Enforce clear, consistent labels | Analysts |
| 10.19 | Segment Access Control | Restrict creation/editing by role | Admins |
| 10.2 | Segment Usage Analytics | Track which segments are used and where | Admins |

Module XI: Data Governance and Data Dictionary

This module ensures data consistency, quality, and discoverability through centralized metadata management and stewardship.

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| S.No | Feature | Description | Primary Users |
| 11.1 | Centralized Data Dictionary | Define and document all events, fields, and metrics | Analysts |
| 11.2 | Business Glossary Integration | Link technical terms to business definitions | Executives |
| 11.3 | Data Ownership Assignment | Assign stewards to datasets | Data Governance |
| 11.4 | Data Lineage Visualization | Show how data flows from source to report | Data Engineers |
| 11.5 | Schema Change Approval Workflow | Require review before modifying data models | Data Architects |
| 11.6 | Term Search & Discovery | Find data using keywords or categories | All Users |
| 11.7 | Data Quality Rules Engine | Define thresholds (e.g., “95% completeness”) | Data Stewards |
| 11.8 | Data Certification (Trusted Sources) | Flag approved datasets for use | Analysts |
| 11.9 | Data Classification (PII, Sensitive, Public) | Tag data sensitivity for access control | Security |
| 11.1 | Impact Analysis for Schema Changes | Show which reports break if a field changes | Data Engineers |
| 11.11 | Data Catalog Integration (e.g., Alation) | Connect to enterprise catalog tools | Data Governance |
| 11.12 | Usage Statistics for Data Assets | Track who uses which fields | Data Stewards |
| 11.13 | Data Definition Versioning | Track changes to field meanings over time | Data Architects |
| 11.14 | Suggested Synonyms & Mappings | Help users find equivalent fields | Analysts |
| 11.15 | Data Stewardship Dashboard | Monitor health of governed datasets | Data Governance |
| 11.16 | Automated Metadata Extraction | Scan databases and logs to populate dictionary | Data Engineers |
| 11.17 | Data Policy Enforcement Engine | Block queries violating governance rules | Security |
| 11.18 | Data Retention Policy Mapping | Link fields to compliance requirements | Compliance |
| 11.19 | Data Quality Scorecards | Rate datasets on accuracy, completeness, timeliness | Data Stewards |
| 11.2 | Data Request & Access Workflow | Request access to restricted data with approval | Analysts |

Module XII: Role-Based Access Control (RBAC) and Security

This module provides fine-grained permissions to ensure data security, compliance, and separation of duties.

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| S.No | Feature | Description | Primary Users |
| 12.1 | Role-Based Permissions (Viewer, Editor, Admin) | Define access levels | Admins |
| 12.2 | Project-Level Access Isolation | Restrict users to specific projects | Admins |
| 12.3 | Field-Level Security (PII Masking) | Hide sensitive columns from unauthorized users | Security |
| 12.4 | Single Sign-On (SSO) Integration (SAML, OIDC) | Authenticate via corporate identity providers | IT |
| 12.5 | Multi-Factor Authentication (MFA) | Enhance login security | Security |
| 12.6 | Session Timeout & Inactivity Logout | Auto-logout after inactivity | Security |
| 12.7 | Activity Audit Logs | Log all user actions (logins, exports, edits) | Compliance |
| 12.8 | Permission Inheritance (Org → Team → Project) | Simplify management via hierarchy | Admins |
| 12.9 | Temporary Access Grants | Provide time-limited access for contractors | Admins |
| 12.1 | Access Certification (Periodic Reviews) | Require managers to reconfirm access | Compliance |
| 12.11 | Breach Detection & Alerting | Detect suspicious login patterns | Security |
| 12.12 | Data Export Approval Workflow | Require approval for large data exports | Compliance |
| 12.13 | API Key Management with Expiry | Secure programmatic access | Developers |
| 12.14 | IP Allowlisting for Admin Access | Restrict logins to corporate networks | Security |
| 12.15 | Role Templates (e.g., “Marketing Analyst”) | Predefined roles for rapid onboarding | Admins |
| 12.16 | Permission Conflict Detection | Identify over-privileged accounts | Security |
| 12.17 | SOC 2 & ISO 27001 Compliance Dashboard | Track control adherence | Compliance |
| 12.18 | Data Access Request Portal | Self-service access with approval | Analysts |
| 12.19 | Just-In-Time (JIT) Access Provisioning | Grant access only when needed | Security |
| 12.2 | Security Health Score | Rate platform security posture over time | CISO |

Module XIII: AI and Machine Learning Integration

This module embeds AI/ML capabilities for predictive analytics, anomaly detection and automation

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| S.No | Feature | Description | Primary Users |
| 13.1 | Automated Anomaly Detection | Flag unusual metric changes using ML | Analysts |
| 13.2 | Predictive Churn Modeling | Forecast user churn probability | Product |
| 13.3 | Lifetime Value Prediction | Estimate future revenue per user | Product |
| 13.4 | Recommendation Engine API | Suggest content/products based on behavior | Product |
| 13.5 | Clustering for User Segmentation | Discover hidden user groups | Data Scientists |
| 13.6 | Natural Language Generation (NLG) | Auto-generate report summaries | Analysts |
| 13.7 | Forecasting with Uncertainty Bands | Show confidence intervals in predictions | Executives |
| 13.8 | AutoML for Custom Models | Train models without coding | Data Scientists |
| 13.9 | Model Versioning & Rollback | Track and revert ML models | Data Scientists |
| 13.1 | Model Performance Monitoring | Track accuracy, drift, and latency | Data Engineers |
| 13.11 | Feature Store Integration | Centralize ML features for reuse | Data Scientists |
| 13.12 | Real-Time Scoring API | Serve predictions in <100ms | Developers |
| 13.13 | Bias & Fairness Detection | Audit models for discriminatory patterns | Compliance |
| 13.14 | Explainable AI (XAI) Outputs | Show why a prediction was made | Analysts |
| 13.15 | AI-Powered Root Cause Analysis | Suggest reasons for metric changes | Analysts |
| 13.16 | Automated Report Insights | Highlight key trends in reports | Business Users |
| 13.17 | Sentiment Analysis on User Feedback | Extract insights from surveys or reviews | Product |
| 13.18 | Intent Prediction from Behavior | Predict next action (e.g., purchase) | Product |
| 13.19 | AI-Based Data Imputation | Fill missing values intelligently | Data Engineers |
| 13.2 | Model Governance & Audit Trail | Track who trained, deployed, and used models | Data Governance |

Module XIV: KPI and Success Metrics Framework

This module provides the ability define, track, and visualize key business outcomes aligned with strategic goals.

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| S.No | Feature | Description | Primary Users |
| 14.1 | KPI Definition Workspace | Create and document KPIs (e.g., Conversion Rate) | Executives |
| 14.2 | Goal Setting & Target Tracking | Set monthly/quarterly targets | Executives |
| 14.3 | North Star Metric Dashboard | Highlight primary business metric | Executives |
| 14.4 | KPI Ownership Assignment | Assign accountability to teams | Executives |
| 14.5 | Leading vs. Lagging Indicator Mapping | Connect actions to outcomes | Analysts |
| 14.6 | Funnel KPIs (e.g., Activation Rate) | Track progress through user journeys | Product |
| 14.7 | Custom Formula Engine | Build KPIs using arithmetic and logic | Analysts |
| 14.8 | KPI Health Scoring (Red/Amber/Green) | Visual status indicators | Executives |
| 14.9 | KPI Drift Alerts | Notify when KPIs deviate from trend | Executives |
| 14.1 | Benchmarking Against Historical Data | Compare to past performance | Analysts |
| 14.11 | Industry Benchmark Integration | Compare to sector averages | Executives |
| 14.12 | KPI Dependency Mapping | Show how KPIs influence each other | Executives |
| 14.13 | OKR Integration | Link KPIs to Objectives and Key Results | Executives |
| 14.14 | KPI Reporting Templates | Standardize executive reports | Executives |
| 14.15 | Scenario Modeling for KPIs | Simulate impact of changes | Executives |
| 14.16 | Real-Time KPI Dashboards | Live monitoring of critical metrics | Executives |
| 14.17 | KPI Anomaly Attribution | Identify drivers behind changes | Analysts |
| 14.18 | KPI Versioning | Track definition changes over time | Analysts |
| 14.19 | KPI Approval Workflow | Require sign-off before adoption | Executives |
| 14.2 | KPI Usage Analytics | Track which KPIs are used in reports | Analysts |

Module XV: Developer and Admin Tools

This module provides tools for developers and administrators to configure, monitor, and extend the platform.

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| S.No | Feature | Description | Primary Users |
| 15.1 | RESTful Management API | Configure tracking, users, and reports programmatically | Developers |
| 15.2 | Webhooks for Event Notifications | Trigger external actions on data events | Developers |
| 15.3 | SDK Documentation Portal | Hosted docs with examples and tutorials | Developers |
| 15.4 | Data Quality Monitoring Dashboard | Track missing events, schema drift, pipeline errors | DevOps |
| 15.5 | Configuration Import/Export | Migrate settings between environments | Admins |
| 15.6 | System Health Dashboard | Monitor uptime, latency, error rates | DevOps |
| 15.7 | Usage & Cost Analytics | Track data volume, query load, and expenses | Finance |
| 15.8 | Plugin Architecture | Extend platform with custom modules | Developers |
| 15.9 | CLI Tool for Admin Tasks | Automate setup and maintenance | DevOps |
| 15.1 | Debug Console for SDKs | Inspect event payloads in real time | Developers |
| 15.11 | Automated Schema Discovery | Suggest tracking improvements based on usage | Analysts |
| 15.12 | Integration Marketplace | Discover and install third-party connectors | Admins |
| 15.13 | Custom Transformation Scripts | Write JavaScript/Python to modify events | Developers |
| 15.14 | Tenant Management Console | Manage multiple clients in SaaS mode | Admins |
| 15.15 | Backup & Restore Utility | Safeguard configurations and metadata | DevOps |
| 15.16 | Performance Profiler | Identify slow queries or components | DevOps |
| 15.17 | Onboarding Wizard | Guide new users through setup | Admins |
| 15.18 | Release Notes & Changelog | Communicate updates and fixes | All Users |
| 15.19 | Community Forum Integration | Enable peer support and feedback | All Users |
| 15.2 | Health Check API | Monitor platform status from external systems | DevOps |