

Publishers Clearing House - Data Flow & Segmentation Architecture

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Data Sources	ETL / Orchestration	Processing & Storage
<ul style="list-style-type: none">• SQL Server & DB2 — Orders & Sweepstakes Entries• Google Analytics & Web Platforms• Email Platforms — Click & Engagement Data• APIs — Customer & Partner Surveys• Gaming Engagement Data• AWS S3 / SQS — Application Files & Messages• Experian — 3rd Party Demographics	<ul style="list-style-type: none">• Apache Airflow (Google Cloud Composer)• Python transformation scripts• Docker containers on Kubernetes• Metadata-driven pipeline design	<ul style="list-style-type: none">• Raw & curated datasets in BigQuery• Segmentation, attribution, personalization models• Analytical datasets for targeting & performance metrics

Governance, Security & Compliance

Access Control	PII & Privacy	Encryption & Keys
<ul style="list-style-type: none">• IAM roles & Dataset/Table ACLs• Row/Column-Level Security• Policy tags via Data Catalog	<ul style="list-style-type: none">• PII classification & masking• Hashing for secure joins• Consent tracking in customer dimensions	<ul style="list-style-type: none">• At-rest encryption (GCS/BQ)• TLS in-transit• CMEK and KMS-managed key rotation
Lineage & Catalog	Audit & Monitoring	Data Quality & Reliability
<ul style="list-style-type: none">• Central metadata repository• Column-level lineage tracking• Owner & SLA metadata	<ul style="list-style-type: none">• Cloud Audit Logs, Airflow DAG logs• SIEM integration & alerting• Access anomaly detection	<ul style="list-style-type: none">• Validation rules & data quality checks• SLA freshness monitoring• Quarantine & rollback on failure

Downstream Flows

- Audience segmentation for ad targeting and personalization.
- Campaign delivery to external email vendors.
- Merge enriched data back into SQL Server with personal identifiers.
- Generate sales leads and share with partners.

Compliance targets: GDPR, CCPA, least-privilege IAM, and separation of duties for production changes.

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