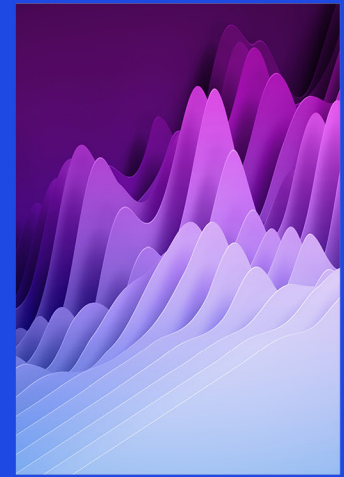# De-identify patient imaging records with automation to create more value from healthcare data

Unlock new treatments and procedures faster

Healthcare patient data has great value in the clinical, analytics, and research marketplace, but these complex data sets are challenging for maintaining patient confidentiality. De-identification is a largely manual process, usually occurring one patient file at a time, and can take anywhere from 15 minutes to an hour for a complex record.

If hospitals and providers want to access more grants, participate in more research studies, and drive better patient outcomes, then they need to leverage the computational power of the cloud. Patient records can be de-identified en masse, in minutes, and with little effort.

More efficient ways of making patient data available while protecting personal health information (PHI) is the goal of the KPMG proprietary Data Transformation and Migration Hub (DTM). This solution supports a multiplatform environment, including on-premises and cloud, to interface with existing healthcare information technology (IT) systems.

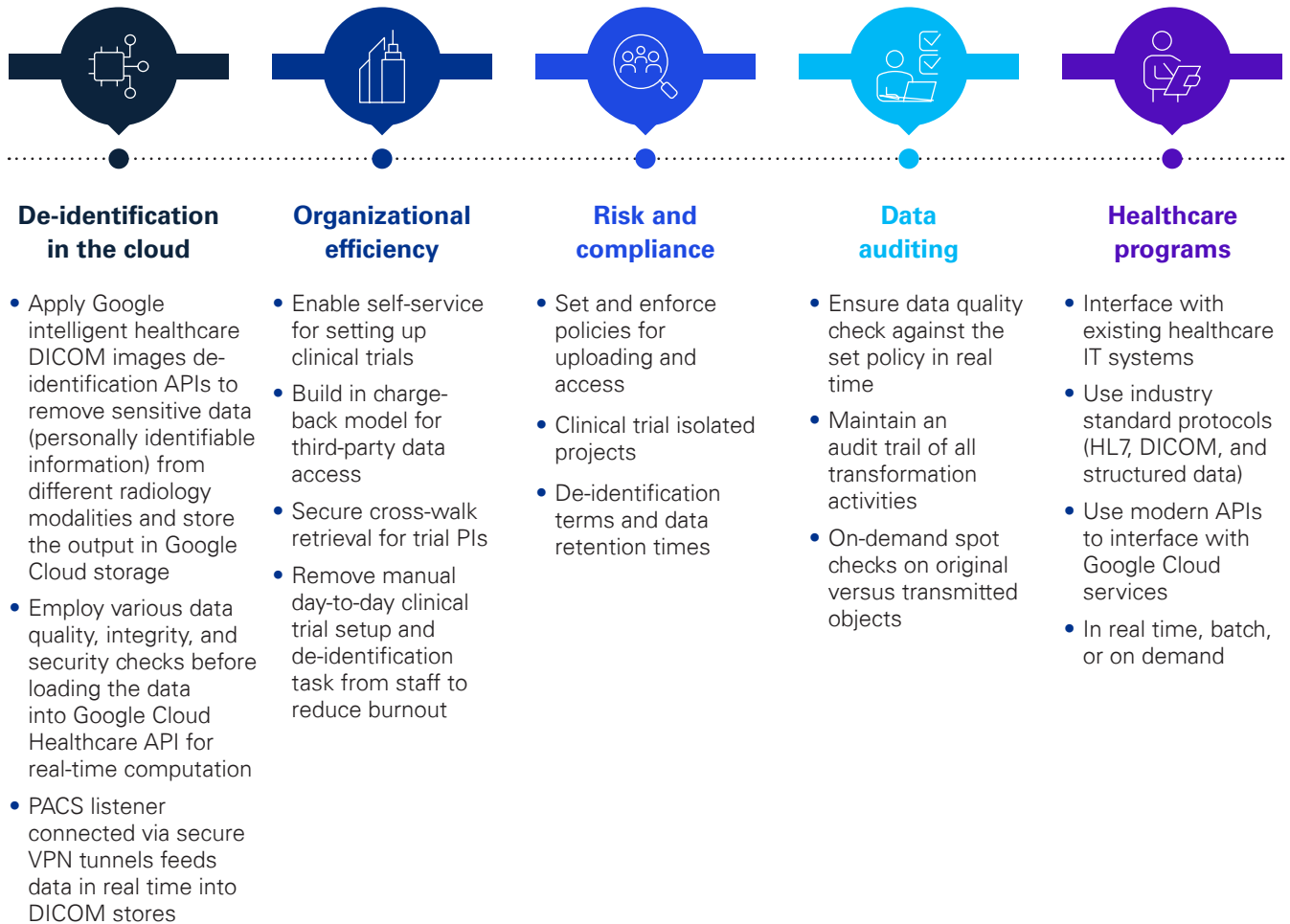## Unlocking Google Cloud's De-Identification in the cloud

Hospitals today have an immense amount of value information, but in most cases, a significant manual effort is required to be able to use that data to derive real insights. One of the major challenges around imaging and creating datasets is the labor-intensive task of protecting patient confidentiality while identifying and providing information required for third-party clinical trials, analytics, and artificial intelligence/machine learning applications. In order to increase the speed, accuracy, and efficiency of the de-identification process, KPMG expanded upon its DTM, leveraging the Google Cloud environment to build out a solution using Google Cloud services, including their digital imaging and communications in medicine (DICOM) adapter and healthcare application programming interface (API).

By incorporating Google Kubernetes to deploy DICOM adapters, the solution is able to ingest real-time, batch, and on-demand images from picture archiving and communications systems (PACS). De-identification rules and requirements are configured in a separate process per trial or by other metadata tags. To help ensure security and identity and access management, processed images are placed in separate siloed projects based on third-party access. Special features also exist to allow patient cross-walk for re-identification for privileged users and a DICOM viewer can be enabled to allow viewing of images without having to leave Google Cloud.

As the graphic shows, the DTM has five capabilities to map data demand and leverage the computational power of the Google Cloud:

Mapping data demand with KPMG and Google Cloud DICOM de-identification capabilities

De-identification in the cloud	Organizational efficiency	Risk and compliance	Data auditing	Healthcare programs
• Apply Google intelligent healthcare DICOM images de-identification APIs to remove sensitive data (personally identifiable information) from different radiology modalities and store the output in Google Cloud storage • Employ various data quality, integrity, and security checks before loading the data into Google Cloud Healthcare API for real-time computation • PACS listener connected via secure VPN tunnels feeds data in real time into DICOM stores	• Enable self-service for setting up clinical trials • Build in charge-back model for third-party data access • Secure cross-walk retrieval for trial PIs • Remove manual day-to-day clinical trial setup and de-identification task from staff to reduce burnout	• Set and enforce policies for uploading and access • Clinical trial isolated projects • De-identification terms and data retention times	• Ensure data quality check against the set policy in real time • Maintain an audit trail of all transformation activities • On-demand spot checks on original versus transmitted objects	• Interface with existing healthcare IT systems • Use industry standard protocols (HL7, DICOM, and structured data) • Use modern APIs to interface with Google Cloud services • In real time, batch, or on demand

De-identification in action

Third-party clinical trials

The current process for de-identifying DICOM studies for clinical trials is heavily manual and time consuming. (DICOM is the standard for the communication and management of medical imaging information and related data.)

Our solution modernizes the PHI data redaction process by transforming manual processes into automated real-time operation systems. This allows for access to higher volumes of studies and easier integration with additional patient records and history to further increase the value of data per study. Healthcare providers can be confident that through the KPMG solution they can unlock increased value of cloud de-identification in the following ways:

• Save more than 80 percent in labor hours spent on DICOM de-identification each year

• Increase the market value of de-identified studies that include PET scans, CT scans, and X-rays:

- Collated and annotated studies have higher research value

- Automated de-identification provides access to higher volumes of studies

- Additional patient records and history can potentially increase the value of a study

• Improve participation in clinical trials:

- Ability to efficiently de-identify studies enables participation in more clinical trials

- Curated de-identified data sets can be marketed to external research firms, pharmaceutical companies, and insurance providers

- Brings the client closer to anonymization of a complete patient record.

Accelerating de-identification in the cloud

As healthcare providers increasingly seek to create value by de-identifying patient records, they are turning to KPMG for our clinical perspective and deep healthcare experience. They also are relying on our tools and technology to help accelerate product development.

We imagine a healthcare future where any patient record can be de-identified. It could unlock a world of value, data commercialization, and acceleration of research that most health systems can only dream about now. Our holistic view, technological capabilities, and alliance with Google Cloud are the pillars on which this future rests.

Connect with one of our team members to learn more.

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