



# Smart healthcare

A data driven approach to healthcare



KPMG Healthcare Analytics

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March 2022

# KPMG Lighthouse

## Middle East capabilities

KPMG Lighthouse ME brings you global capabilities from more than 26 countries and more than 12,500 experts, along with more than 60 locally sourced data professionals with a unique understanding of the region.

### Access to a global network of 12,500 experts

including more than 1,700 data scientists and data engineers

### Global development and delivery platforms

such as KPMG Ignite and KPMG Sofy with more than 600 pre-built solutions and robust methods and applications to scale execution

### Trusted technology and data infrastructure

closely linked to our global strategic alliance partner

### More than 7,000 supported client engagements per year

working shoulder to shoulder with client engagement teams across audit, tax and advisory

### Innovation engine

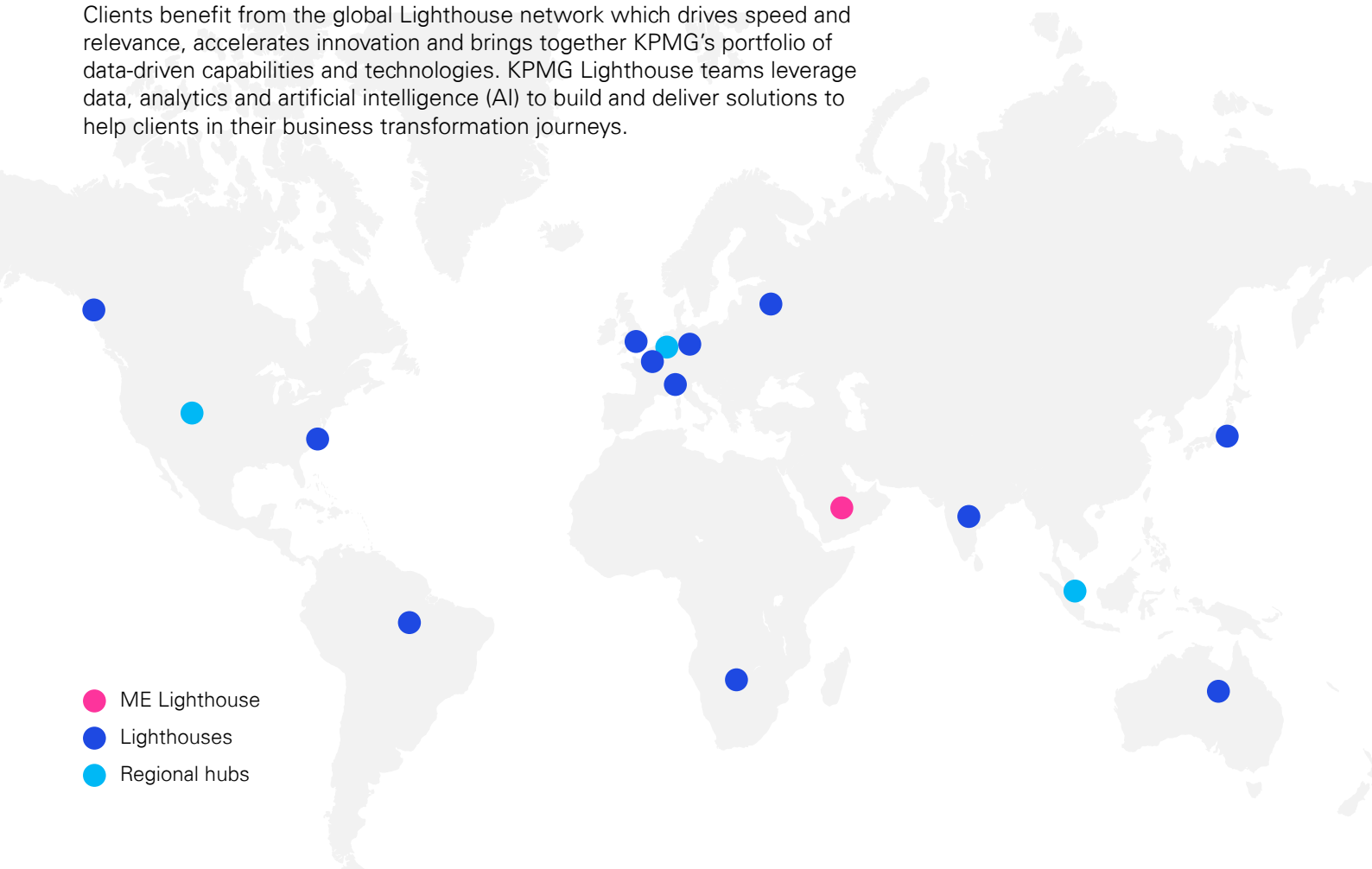
Innovation labs with alliance partners and co-creation projects with clients to build prototypes and innovative solutions

### Customer focus enabled by leading edge technology

at eight global KPMG Insights Centers to experience the art of the possible



Clients benefit from the global Lighthouse network which drives speed and relevance, accelerates innovation and brings together KPMG's portfolio of data-driven capabilities and technologies. KPMG Lighthouse teams leverage data, analytics and artificial intelligence (AI) to build and deliver solutions to help clients in their business transformation journeys.



- ME Lighthouse
- Lighthouses
- Regional hubs

# Over 100 projects globally delivered/in-delivery to support the Covid-19 response



46

Practices in KPMG firms



4,500+

KPMG partners and staff work in healthcare



Equipped and experienced advisory teams across the global organization

## Global healthcare experience

### Canada

- Reducing length of stay for Covid patients

### Switzerland

- Development of self monitoring and patient engagement app

### United Arab Emirates

- Covid-19 and operational healthcare dashboards
- Disease impact management simulator
- Type 2 diabetes (T2D) and cardiovascular disease (CVD) risk calculators

### United States

- Ensuring effective discharge planning, predicting length of stay and minimizing unplanned readmissions
- Workforce optimization

### Australia

- The first Australian electronic prescription
- Predicting length of stay
- Ambulance Victoria: predict short term ambulance demand by geographic area

### United Kingdom

- Lincolnshire health and care system: modeling the economic impact of change and scenario modeling for OOH care (using finance and activity data to shift system expenditure from deficit to surplus)

### Israel

- Using natural language processing (NLP) for medical records analysis
- Patient's journey- accessing the medical process digitally while accompanying the patient throughout his medical journey
- Automatic appointments scheduling

# Healthcare service offerings

KPMG's healthcare analytics capabilities aims to address the most pressing demands in healthcare:



## Operational excellence

Clinicians can become more efficient by addressing the root causes of certain inefficiencies in their processes.



## Artificial intelligence

Routine clinical practice generates petabytes of data per year. Machine Learning (NLP) and Imaging AI are used to improve clinical workflows, expedite diagnosis and predict patient risk.



## Digitizing the patient journey

System reformers can ensure patients a frictionless experience by presenting the medical journey in digital form and providing digital assistants as key differentiators.



## Business intelligence (BI) and reporting

Storage, query, and analysis of clinical data are currently difficult due to the lack of data consolidation. BI provides decisions makers with right tools to assess the use of resources and find economies of scale.

The KPMG Lighthouse ME team combines deep technical skills with local delivery experience. This expertise is complemented by a large selection of use cases developed by our global network of KPMG member firms.



Data



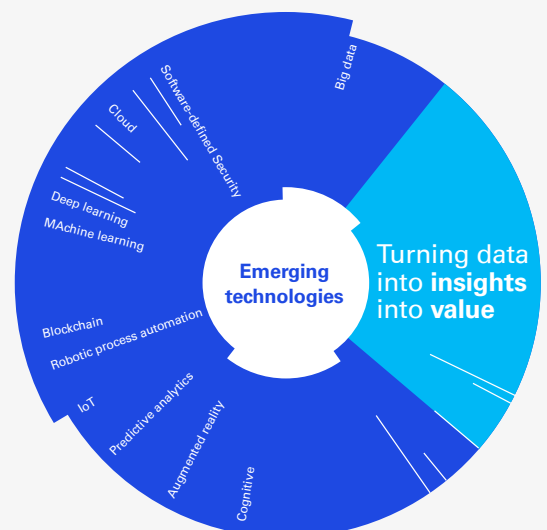
Analytics



Intelligent automation



Artificial intelligence





# Value chain use cases

## Public health layer

Economic impact simulator

Campaigns feasibility predictions

Outbreak forecasting and control

## Healthcare provider layer



### Patient diagnosis

- Digital nurse
- Treatment adherence anomalies
- Personalized monitoring and alerting system
- Prediction of patient chronic disease risk level
- Community health mapping



### Specialist Consultation

- Symptoms checkers to reduce time for diagnosis
- Schedule booking optimization
- Medical staff workforce planning
- Optimization of operating room flow
- Feedback NLP analysis
- Diagnostic error reduction



### Healthcare provider

## Insurance layer



### Product development

- Customers profiling
- Network graphical analysis
- Features conjoint analysis



### Underwriting

- Risk profile
- Coverage percentage Recommendation
- Personalized policy rating



### Marketing

- Customized campaigns
- Leads prioritization
- Work load optimization for agents
- Products recommendation

## Supporting functions layer



### Brand management

- Brand perception
- Customized target campaigns
- Patient sentiment



### Finance

- Willingness to pay simulation
- Pricing optimization
- Revenue collection probability
- Working capital optimization



### Human resources

- CV screening and new hire simulator
- Top medical talent retention
- Performance anomalies
- Top performers profile

Contact tracing and social control



### Patient Care

- Medical history network graphical analysis
- Prescription auditing
- Personalized medication reminder
- Activity and sleep tracker
- Wellbeing motivation triggers
- Patient profile and clustering



### Labs and Scans

- Medical imaging insights
- Early diagnosis
- Cardiovascular abnormalities
- Screening for common cancer types



### Claims management

- Claims fraud detection
- Automated damage evaluation
- NLP FNOL analysis



### Customers service

- Call intent discovery
- Surveys NLP
- Customers LTV prioritization



### Procurement

- Fraud detection
- Tail spend reduction
- Supplier risk classification
- Demand forecasting



# Advanced analytics tailored patient journey

One platform for a unified patient 360 reporting view

## Patient journey



Patient leaves the hospital



### 1 Patient arrival at healthcare provider

### 2 Patient is admitted

#### Use cases

- Early prediction of the onset of diseases using electronic health records
- Predicting the discharge and admission of patients
- Automating patient scheduling and predicting the demand of resource usage

- Convolutional neural networks can be used to classify respiratory diseases using breathing audio
- Computer vision can be used to classify radiology scans
- Classification of fetal health using heart-rate attributes and uterine contraction measurements

#### Benefits

- Ability to identify diseases in advance in an attempt to capitalize on preventative measures
- Improve patient flow and decrease hospital length-of-stay
- Optimize the allocation of resources and reduce the number of no-shows

- Proactive chronic disease detection
- Reduced diagnosis time and increased radiology classification accuracy
- Rapid response in acute emergency care delivery





### 3 Patient is diagnosed and treatment begins

- Patient level feature impact assessment on health treatment
- Advanced healthcare reporting capabilities for a 360 view on patients and physicians
- Measuring sentiment and discomfort levels of patients through audio classification and deep learning
- Tailored health-treatment and medication plans for a more personalized patient-care experience
- Enable data-driven decision making using data trends and patterns for patients, physicians and administrative staff
- Detect and objectively classify patient discomfort levels to assess treatment options



### 4 Patient follow ups

- Closed-loop feedback between patients and clinicals using structured (reporting on medications taken) and unstructured data (audio/video information)
- Utilize machine learning to detect and understand predictors for high-follow up cases
- Enable the sharing of high-quality audio, images, and measurements to feed online machine learning systems for prediction and detection of diseases
- Improve follow-up rates by focusing on the most important predictors for follow-ups



# UAE credentials



## Cardiovascular disease calculator

Used historical encounter data of Emirati nationals in Abu Dhabi to assess the patient's likelihood of developing cardiovascular disease.



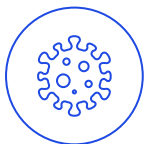
## Economic impact of cardiovascular disease

The Disease Management Impact Simulator (DMIS) is a bespoke AI solution to identify opportunities in addressing the economic impact of cardiovascular disease (ASCVD). DIMS provides insight into the demographics of the patient population, in addition to the direct and indirect costs associated with being diagnosed with ASCVD. DMIS also provides policy makers with a simulator to predict costs, savings and health benefits.



## Diabetes risk calculator

Used historical encounter data of Emirati nationals in Abu Dhabi to create a T2D risk scoring model use case to assess patients' likelihood of developing diabetes over a span of five years.



## Public sector and Covid-19 dashboards

The client needed real-time reporting capability and insights with regard to their healthcare facilities, consumables supply and demand, inpatient data statistics, manpower planning and their operational revenue vs. expenditure amidst the Covid-19 pandemic.



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