Smart Quarantine and Smart Contact Tracing:

Empower Citizens to Stay Healthy and get Back to Work Safely

- In production off-the-shelf solution
- Live in two countries
- 48 Hour Rollout
- GDPR & HIPAA Compliant

Capgemini

Keboola

Perform AI

Artificial Intelligence.
Real World Solutions.

How Do We Reopen the Nation?

"A robust system of contact tracing and isolation is the only thing that can prevent an outbreak and a resulting lockdown from recurring.

Every time an individual tests positive, the public health infrastructure needs to be able to determine whom that person has been in close contact with, find those people, and have them go into isolation or quarantine until it's established they aren't infected, too."

NYT April 6

How Will We Know When It's Time to Reopen the Nation?

Aaron E. Carroll; Aaron E. Carroll professor of pediatrics at Indiana University School of Medicine and the Regenstrief Institute

How to **gradually relax** the quarantine measures to restart the economy while **avoiding a resurgence of the epidemic** and compromising **individual freedoms to a minimum?**

An economic imperative: easing the lockdown

PwC's recent economic forecast for UK GDP growth in 2020 could range from around -3% to -7%, versus pre-Covid19 projections of GDP growth of +1%. The growth in Universal Credit applications by 1m in the last two weeks of March 2020 highlight the impact of lockdown.

https://www.pwc.co.uk/services/economics-policy/insights/uk-economic-update-covid-19.html

A healthcare conundrum: controlling the epidemic

In the last 4 weeks, the global number of confirmed cases has grown from 126k to 1.45m. There are still many unknowns with respect to the spread of the epidemic. If the easing of the quarantine is not done in a controlled way, certain simulations raise fears that over time there could be alternating waves of successive "quarantine / non-quarantine" phases.

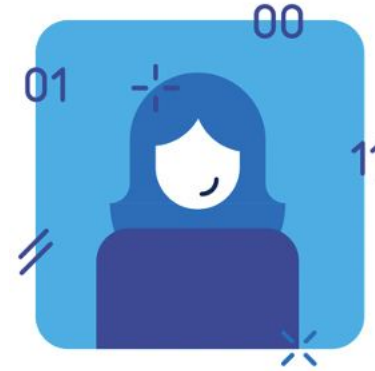## A social issue: getting people to accept the measures

In Scotland, the acceptability of individual monitoring and control measures, like those implemented in Asia, is debatable. Furthermore, the solution should be nationwide and inclusive for it to be accepted.
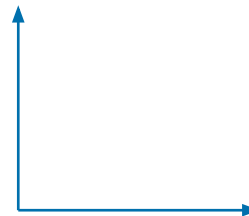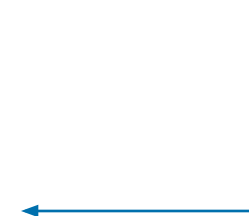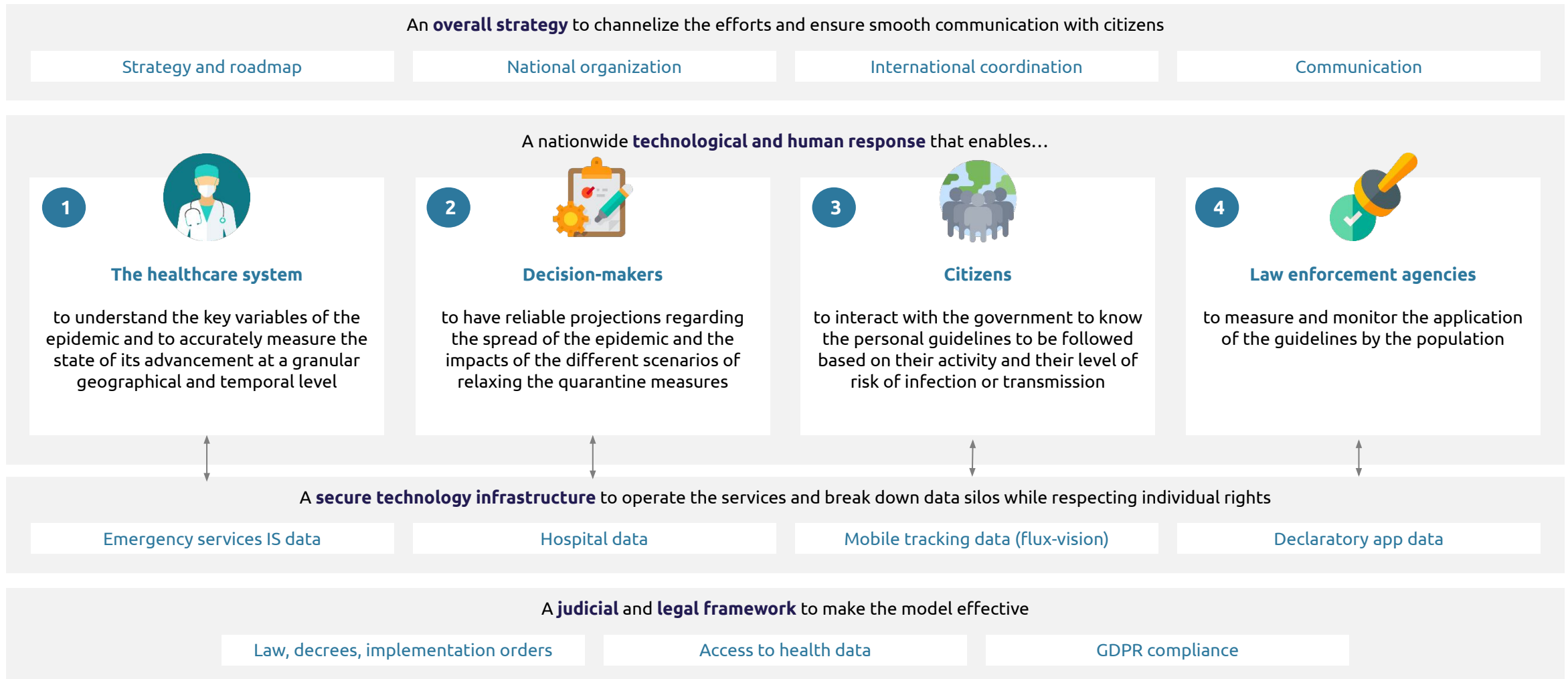
GOVERNMENT

COOPERATION

CITIZENS

PRIVACY-PRESERVING DATA

We will establish a Trusted Data Foundation for cooperation between the Government and the Citizens to save lives and reduce 100x the Economic Impact of COVID19

Build a statewide integrated response

An **overall strategy** to channelize the efforts and ensure smooth communication with citizens

| Strategy and roadmap | National organization | International coordination | Communication |

A nationwide **technological and human response** that enables…

1 — **The healthcare system**

to understand the key variables of the epidemic and to accurately measure the state of its advancement at a granular geographical and temporal level

2 — **Decision-makers**

to have reliable projections regarding the spread of the epidemic and the impacts of the different scenarios of relaxing the quarantine measures

3 — **Citizens**

to interact with the government to know the personal guidelines to be followed based on their activity and their level of risk of infection or transmission

4 — **Law enforcement agencies**

to measure and monitor the application of the guidelines by the population

A **secure technology infrastructure** to operate the services and break down data silos while respecting individual rights

| Emergency services IS data | Hospital data | Mobile tracking data (flux-vision) | Declaratory app data |

A **judicial** and **legal framework** to make the model effective

| Law, decrees, implementation orders | Access to health data | GDPR compliance |

The Challenge

Releasing early or not having the right management could cause a 2nd bloom in Wave 1

Getting ahead of managing subsequent waves is key

A unified approach that can support multiple engagement models, changing policy and citizen collaboration
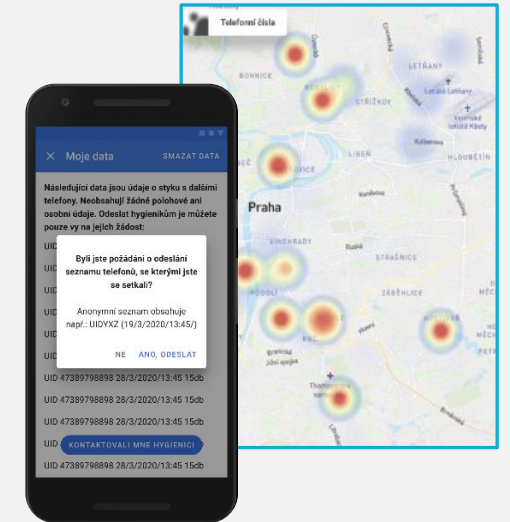

**Top Down –
Contact Tracing and policy
driven Quarantine**

**Smart Quarantine
Application Platform**

Citizen Data Privacy First:
GDPR compliant solution and HIPAA Ready

**Bottom-up
Citizen and
collaboration driven**

COVID Command Center:
Smart Contact Tracing/Smart Quarantine

Solution ensures Trusted Collaboration between Federal, State, Local authorities and Citizens, saving Lives & Economy

Empower Citizens

United Communities

- Citizens collaborate with the authorities
- Privacy protected
- Democracy & freedom

Stay Healthy

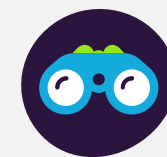### Proactive Smart Quarantine & Monitoring

- Quickly identify people & areas at risk
- Avoid Healthcare Crisis

Get Back to Work

Work Safely

- Know who is infected and who is not
- Allow for controlled access to work
- Minimize risk Back to Work accelerating Wave 2

Mitigate Wave 2

Stop Second Bloom

- Constantly monitor epidemiological situation
- Immediately take targeted, localized measures
- Control virus re-entry
- Policy Modeling, Monitoring and forecasting

What do we do after we flatten the Wave 1 Curve?

Exiting Wave 1 & Preventing / Managing Wave 2

Three Scenarios on lockdown release

1. Lockdown release is too early and causes a 2nd bloom due to a lack of tracking
2. Lockdown release is too late and results in massive economic harm, release then results in a 2nd bloom due to fatigue
3. Lockdown is managed and release is monitored to delay 2nd bloom

Wave 1 + Mass Testing / Lockdown Release / Antibody Certification / Proactive Isolation → A managed plan
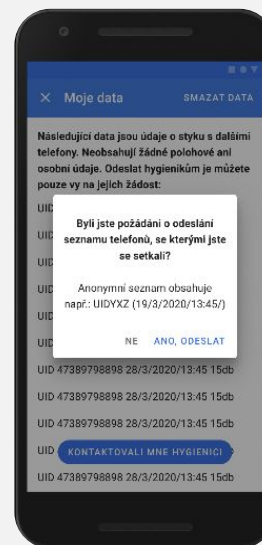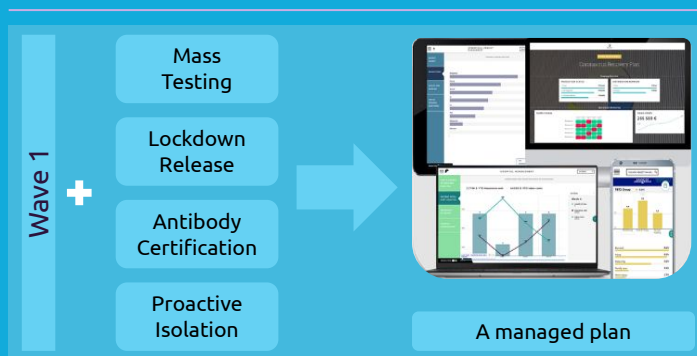
Citizen Centric Smart Quarantine

- Empower Citizens and Reduce Fear – only alert citizens when they are at risk, and do so occasionally
- Allow citizens to manage their risk w/ heatmapping & intelligent forecasting
- Guide them towards the right mass testing strategy based on risk
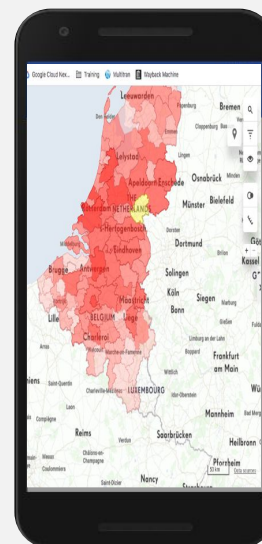
Smart Isolation Release for Businesses & Organisations

- Supporting businesses in the release
  - When are they at risk and should close
  - Work collaboratively with staff to reduce risks

Smart Contact Tracing: Opt-In BlueTooth Mobile App

Responsible Citizen installs the Safety Mobile App:

- Mobile App is anonymous

- Monitors anonymous IDs of others who you encounter and have the app installed (proximity via BlueTooth)

- OPT-IN and the data is then sent to local HHSC to be analyzed

- If the system identifies that you were in touch with an infected person, you receive a recommendation to smart quarantine or COVID19 test
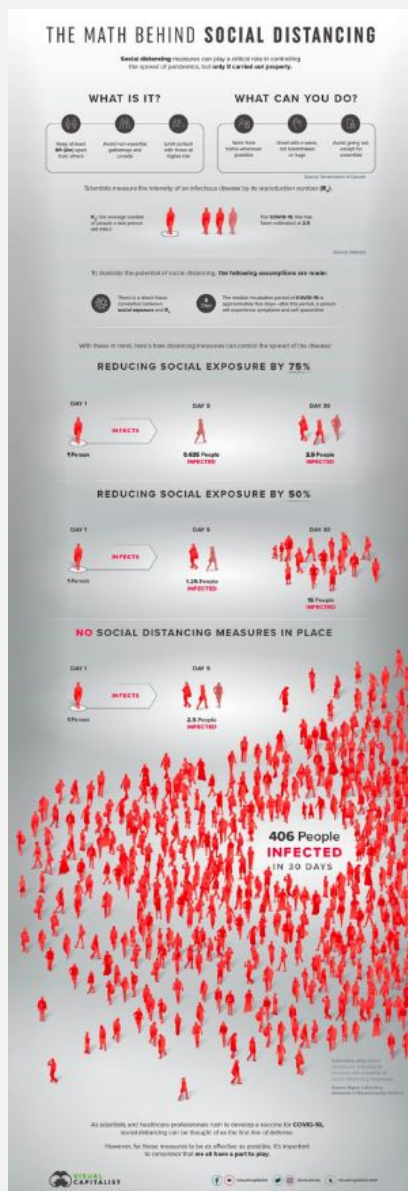
- GDPR/HIPAA compliant

Proactive Notification for State Authorities:

- Analyze aggregated data (see prev. slide)

- Can use the same mobile app to monitor/enforce smart quarantine, control location access (QR code), or COVID19 testing compliance

Immediate

Far

iBeacon

iBeacon

Unknown

Near

iBeacon

iBeacon

Immediate

iBeacon

Data is stored in your smartphone only, auto wiped after 4 weeks

Smart Quarantine

Statewide Contact Database

1 State HD provides phone number of COVID19 positive citizen to Capgemini contact center

Citizen Phone Number

Keboola

2
- Capgemini Agent receives Consent from Citizen to retrieve Data: OPT-IN
- Perform Epidemic Interview

3 CAPGEMINI SMART QUARANTINE* SOLUTION & CALL CENTER

Opt-In → Data ←

Phone Location | Payment Location | Device Location | Device Bluetooth beacon

4
- Agent Collects info on contacts at risk
- Notifies contacts at risk

GDPR & HIPAA, DEPLOYED IN CZ & SK

5 ANALYZE/ENFORCE
- Infected Locations
- People at risk
- Connections
- Flights, Trains, Events
- Quarantine/Testing Compliance

RECOMMENDATIONS
- Understand how the virus is spreading
- Areas to disinfect
- Targeted lockdowns
- Self-Isolation lists
- Citizens to test
- Hospitals Demand Forecasts

THE MATH BEHIND SOCIAL DISTANCING

# Providing the data to enable policy to be made, modelled and tracked

A 360 view of the outbreak

- Brings together all the data sources into a single consistent model
- Ensures privacy and health regulations are met
- Constantly updated with new information

Model

- Scenario planning and forecasting based on historical and predicted data
- Support modelling of different policy options and their impacts
- Support model sharing
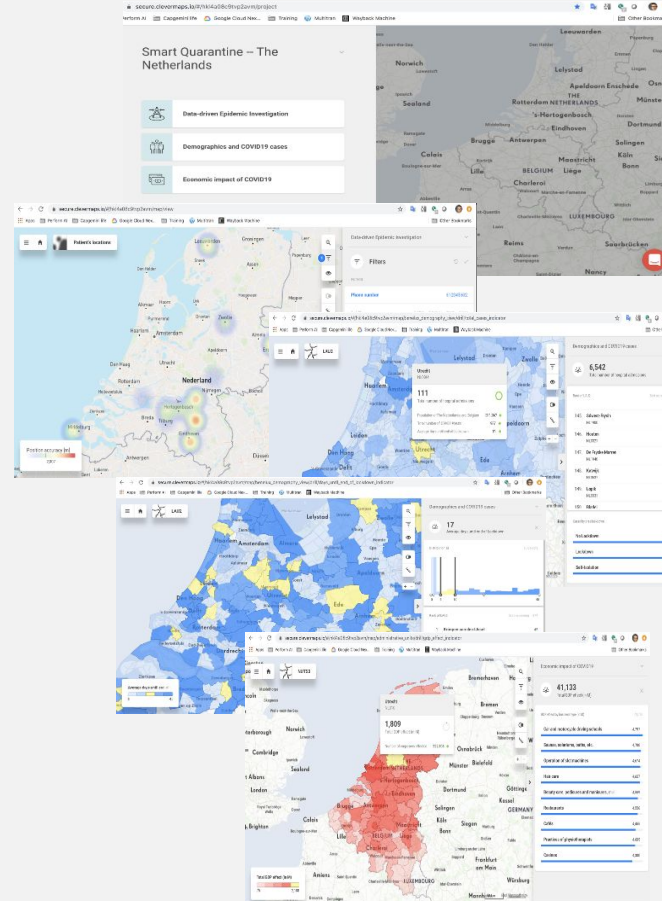
Monitor

- Track adherence to policy
- Give the fastest most accurate view of whether the outbreak is trending as predicted
- Put the information required into responders hands

Guide

- Use the data to guide citizens towards positive behaviours
- Leverage data and communication channels to support policy decisions
- Enable policy modifications to be communicated in real-time

Smart Quarantine Contacts:

Anne.Woodley@capgemini.com

About Capgemini
A global leader in consulting, technology services and digital transformation, Capgemini is at the forefront of innovation to address the entire breadth of clients' opportunities in the evolving world of cloud, digital and platforms. Building on its strong 50-year heritage and deep industry-specific expertise, Capgemini enables organizations to realize their business ambitions through an array of services from strategy to operations. Capgemini is driven by the conviction that the business value of technology comes from and through people. It is a multicultural company of over 200,000 team members in more than 40 countries. The Group reported 2018 global revenues of EUR 13.2 billion.
Visit us at www.capgemini.com. *People matter, results count.*

Smart Quarantine and Contact Tracing:
Features & functionality to fight COVID19

- Warn only when required

- Filter out false positives

- Avoid the virus bounce

- Proactively manage demand for mass testing

- Ensure tests are fast and effective

- Enable Track & Trace to keep the virus under control

- Achieve targeted isolations by defining hazardous coordinates combined with telco, banks, and other geolocation data

- Get insights on crowded/infected locations & proactivley shut them down

- Personal app & Call Center interactions in concert with State/Local Government to keep citizens informed

- Provide epidemiologists and officials with data to forecast and manage the outbreak (e.g. DHHS, education, economic development)

Ethical Principles of Smart Quarantine Solution

Data & AI as a Tool

| The human decides |
| Data & AI helps |
| Data & AI augments |

Data & AI Ethics

| Data Privacy First |
| Explainable |
| Lawful |

Capgemini Smart Quarantine Solution
manages COVID19 impact with speed, efficiency and security

Citizen Data Privacy First: HIPAA & GDPR compliant solution

EXPLICIT PERMISSION

- NO DATA is retrieved without patient's OPT-IN
- Every COVID19 patient is asked for permission to use linked data sources
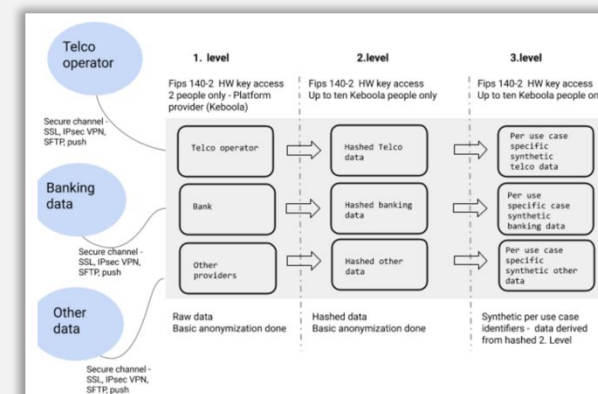- Consent is independently verified & stored

CONTINUOUS DATA AUDIT

- Reputable 3rd party audit is performed on all stages of Data usage/retrieval (i.e. PwC) to verify compliance with rules for data shares
- Dedicated secure API for audit & tracing
- AI for detecting potential threats
- GDPR & HIPAA compliant

CERTIFIED SECURITY

- Full stack is ISO 27001 compliant
- SOC 2 Type II certified
- All data are encrypted, all data transport via HTTPS with latest security polices of AWS. Access to the environment is secured with additional authorization devices with FIPS 140-2 certification
- Physical separation of data and resources on the "metal" level
- Three separated infrastructure levels are then represented by 3 discreet maintainers to ensure full data and access separation: Primary (unhashed) data, Secondary hashed data with limited access, Use case specific synthetic data
- Automated Data Wiping after 4 weeks

GDPR & HIPAA, DEPLOYED IN CZ & SK Keboola

2020 WORLD'S MOST ETHICAL COMPANIES™
WWW.ETHISPHERE.COM
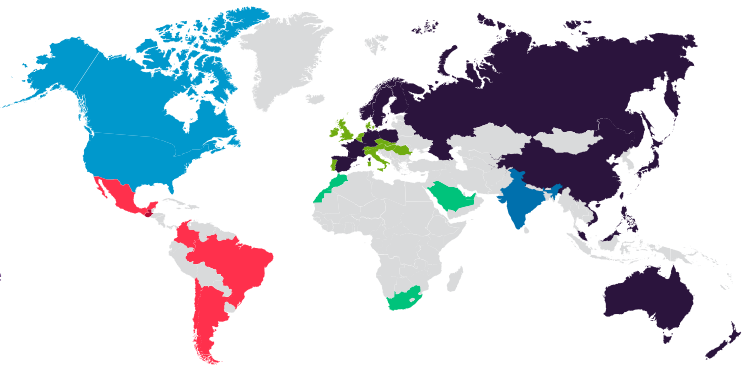8 TIME HONOREE

About Capgemini

Capgemini is one of the world's largest management and IT consulting companies – combining strategy, design, and technology

One global team

Capgemini is present in **more than 40 countries and more than 120 nationalities**

210,000+ people worldwide

A complete range of businesses

Revenue 2018: $15 Billion

Consulting Services	Application Services	Technology Services	Management Services

A broad variety of sectors

- Consumer Products, Retail, Distribution & Transportation
- Telecom, Media & Entertainment
- Manufacturing, Automotive & Life Sciences
- Others

- Public Sector
- Financial Services
- Energy, Utilities and Chemicals

Best of breed under one roof

Capgemini invent

Capgemini

DIGITAL TRANSFORMATION
Top 5 consultancy globally. We wrote THE book on Digital

INNOVATION STRATEGY
Creating new products, services and experiences that deliver sustainable, profitable growth

DIGITAL CX STRATEGY & DESIGN
One of the fastest growing customer interaction design firms

RE-IMAGINING ENGAGEMENT
Market leader in customer engagement and digital architecture

TECHNOLOGY & APPLICATION SERVICES
Experts in Platforms, Enterprise Architecture, and Digital Transformation

Capgemini End-to-End capabilities

SOLUTION -EXAMPLES

Customer Engagement & Commerce

- Omnichannel Design
- Digital Service Design
- Commerce Management
- Content Management
- Digital Experience Transformation
- Digital Workplace
- Experience Design
- User Interfaces

Insights & Data

- Applied Insights
- Master Data Management
- Data Science & Analytics
- Big Data
- Enterprise Content Management
- Privacy by Design
- GDPR

Business Process Outsourcing

- HR Management
- Finance and Accounting Transformation
- Supply Chain Management
- Retail Banking, Insurance, Healthcare Provider Outsourcing
- Customer Operations

Cloud, Infrastructure, & Business Applications

- Cloud Native
- Cloud Migration
- Public/Private Cloud
- DevOps
- Next-Gen Application Dev & Maintenance
- Infrastructure Services

Product Engineering
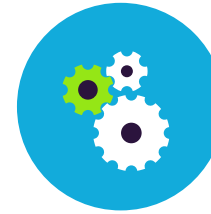
- Embedded Systems Dev
- Software Development
- Manufacturing Engineering
- Mechanical Design & Simulation
- Physical Engineering
- Product Lifecycle Management
- Technical Publications

Digital Manufacturing/ IoT

- 3D Continuity
- Complex Systems Simulation
- Digital Workers
- Digital Manufacturing Transformation
- Industrial Control Systems
- Manufacturing Intelligence
- Product Lifecycle Management

Testing & Quality

- DCX & Mobile Solutions Testing
- Embedded Testing Services
- Managed Testing Services (MTS)
- Physical & System Testing
- Test Automation

Spanning 50 years as an independent company ...

1967
SoGETI founded by Serge Kampf in Grenoble, France on October 1

1968
Gemini Computer Systems Inc. based in New York

1973
Sogeti, Gemini Computer Systems and CAP merged as

1975
First Annual Report published

1978
Cap Gemini Inc. established in Washington DC

1985
Cap Gemini Sogeti listed on the "Second Market" of the Paris Stock Exchange

1991
Creation of Consulting resulting from the merger of five management consulting firms

1993
First transformation program of the Group's organization, sales approach, methods and culture, called "Genesis"

1996
The Group reorganized its shareholding and management structure and adopts a new name and a new logo: CAP GEMINI

1998
Cap Gemini is included on the CAC 40 listing on the Bourse

2000
Acquisition and merger with Ernst & Young Consulting to form

2002
Name revived to offer Local Professional Services

The Board of Directors name Paul Hermelin, CEO

Opening of an international training and conference center in France at Les Fontaines

2004
Name and logo changed to coinciding with global ad campaign to position "The Collaborative Business Experience™"

2007
Capgemini acquires Kanbay and Indigo, expanding its offshore capabilities in India

2009
Consulting Services becomes a global entity:
Capgemini Consulting

2010
Acquisition of CPM Braxis in Brazil

2011
Eight acquisitions, including Prosodie, leader in front office transaction solutions

2012
Paul Hermelin is appointed Chairman & CEO

2013
Capgemini has been named by the Ethisphere Institute's as one of the World's Most Ethical Companies for 2013 (for the first time)

2014
Acquisition of Euriware

2015
Acquisition of IGATE

2016
March 15th: Founder Serge Kampf passes away at the age of 81. Acquisitions of Fahrenheit 212 and oinio.

2017
50th Anniversary of the Group. Four acquisitions: Idean, Tcube, Itelios, Lyons Consulting Group. New brand identity

2018
Four acquisitions: Adaptive Labs, LiquidHub, DOING, June21. Creation of Capgemini Invent, the new digital innovation, consulting and transformation global business line of the Group.
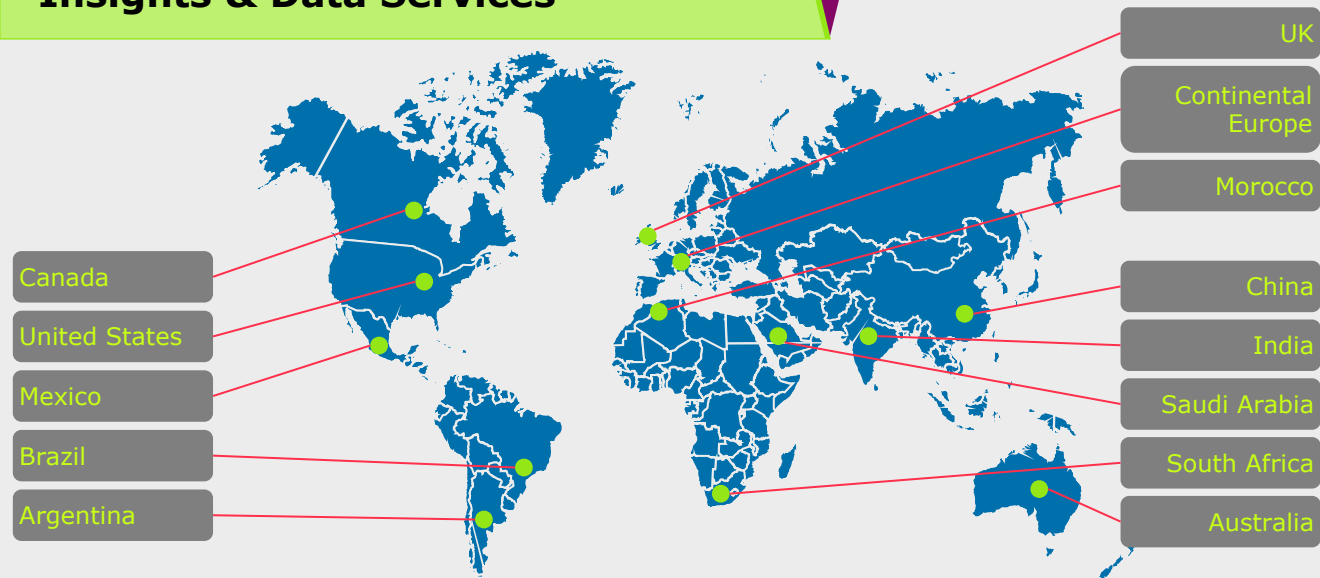
2019
Acquisition of Leidos Cyber

19

CAPGEMINI INSIGHTS & DATA ORGANIZATION
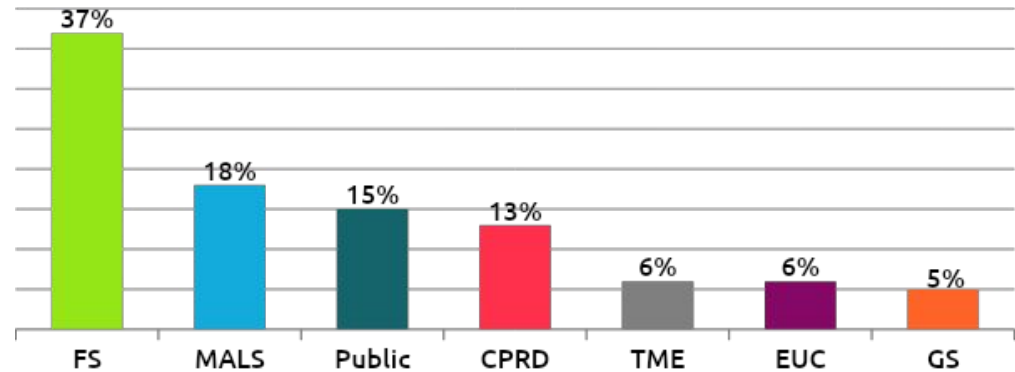
Insights & Data Services

UK

Continental Europe

Morocco

China

India

Saudi Arabia

South Africa

Australia

Canada

United States

Mexico

Brazil

Argentina

More than **23,000** people across **40** countries **15,700** people in India

HC assigned to main geographies

	NA	WE	APAC	RoW
Personnel onshore:	2.020	3.960	955	640
Personnel offshore:	8.118	6.415	840	327
Total assigned to Geo:	**10.138**	**10.375**	**1.795**	**967**

Revenue by Sector/Portfolio

Revenue by Industry

- FS: 37%
- MALS: 18%
- Public: 15%
- CPRD: 13%
- TME: 6%
- EUC: 6%
- GS: 5%

2,3$B Revenue

Revenue by Portfolio Play

- ■ D&A Strategy, Architecture, Tech Consulting
- ■ AI & Data Engineering, New Data Landscape
- ■ AI & Insights
- ■ Applied Insights Center
- ■ Platform

Pie chart: 20%, 30%, 30%, 15%, 5%
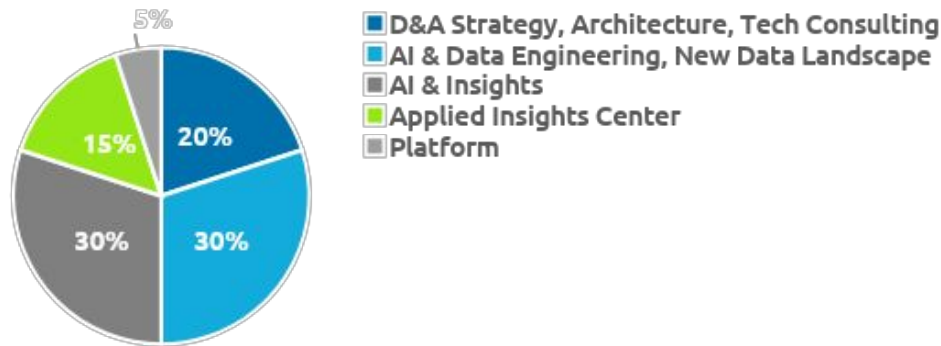
We partner with our clients to create and deliver exactly the capabilities & solutions that they need to thrive on data. We deliver real business outcomes, covering end-to-end at scale, harnessing ethics & trust

Insights and Data - Awards & Recognitions

Insights & Data Partner Awards

2019 SAS Global Forum award 'Western Europe Partner of the Year'

Capgemini recognized as winner for 2019 'Microsoft SAP on Azure' Partner of the Year

'MuleSoft's Global Partner of the Year' for 2018

2018 SAP® Pinnacle Award as "Customer Choice Partner of the Year - Large Enterprises"

'HPE Partner of the Year for Data and Analytics' for 2018

Analyst Credentials

1 Capgemini positioned as a **Leader** in Gartner's Magic Quadrant for Data & Analytics Services, 2019 & 2020

2 Capgemini named a **Major Player** in Gartner's Market Guide for MDM External Service Providers, 2018 & 2019

3 Capgemini positioned as a **Leader** in Nelson Hall Vendor Evaluation and Assessment Tool (NEAT) report for Advance Analytics in BPS for 2019

4 Capgemini positioned as **Leader** in Everest Group Data & Analytics Services PEAK Matrix™ Assessment 2019 & 2020

5 Capgemini recognized as a **Key Player** in the HFS top 10 Microsoft AI Services for 2019 and HFS Google AI Services top 10 report for 2019

Insights & Data Industry Recognition

Capgemini wins 2019 Artificial Intelligence Breakthrough award for best virtual agent solution

Capgemini named one of the 2019 & 2020 World's Most Ethical Companies® by the Ethisphere Institute for the 6th consecutive year
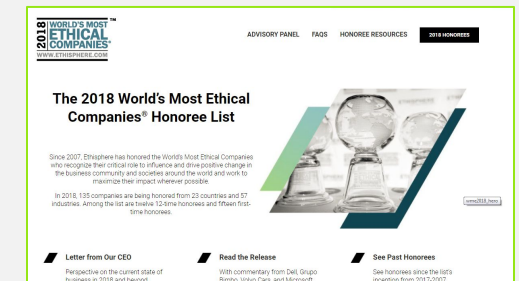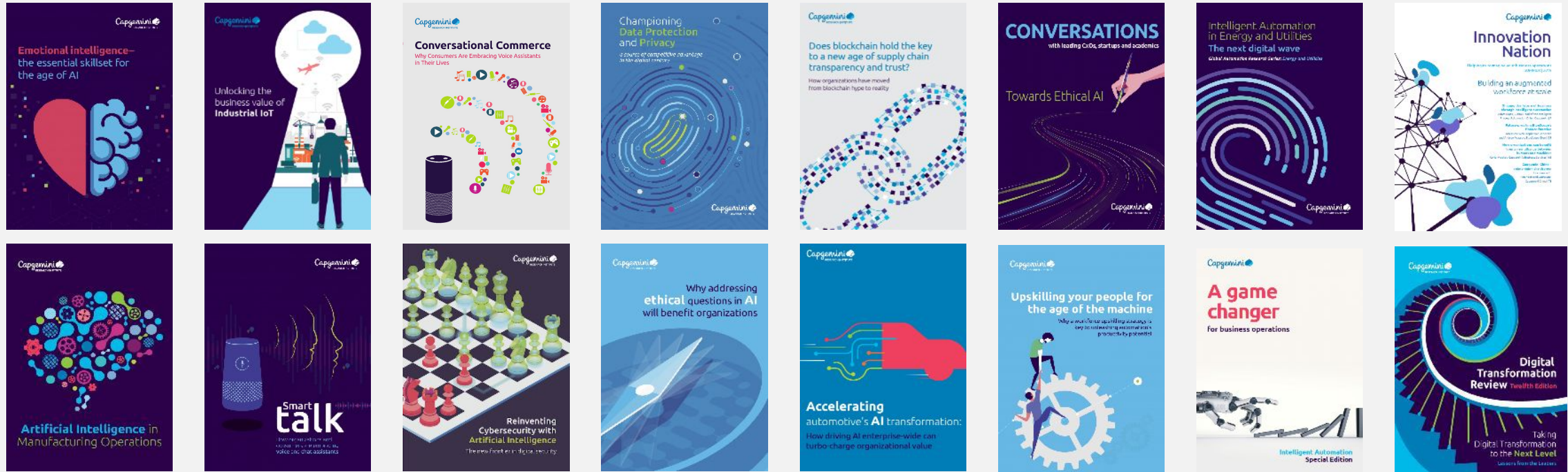
A TRUSTED INDUSTRY THOUGHT LEADER

Through our Capgemini Research Institute the worldwide network of Capgemini experts work closely with academic and technology partners for top quality reports
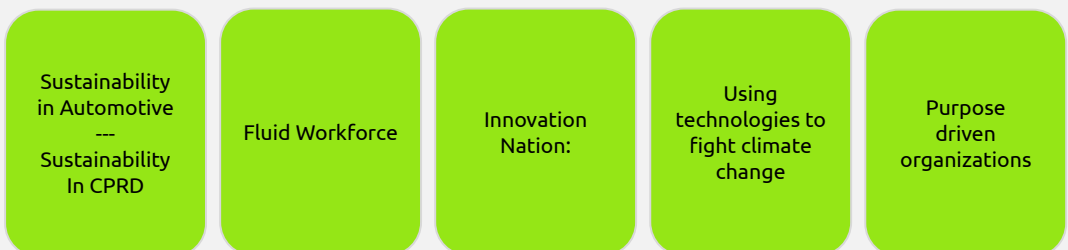
Recent Publications

Just Published: TechnoVision 2020

2020 Planned Researches - Confidential

| Sustainability in Automotive --- Sustainability In CPRD | Fluid Workforce | Innovation Nation: | Using technologies to fight climate change | Purpose driven organizations |

Partner Recognition

Group Partner

Microsoft
- 2019 Microsoft SAP on Azure Partner of the Year
- 2019 Microsoft SAP on Azure Advanced Specialist
- 2019 Microsoft Dynamics Inner Circle, Italy

salesforce
- Horizon Interactive Awards:
  - Best in Category for work with Allen Edmonds
  - Gold Awards for work with KUIU, Titleist and e.l.f. Cosmetics
- ISG Paragon Award™ ANZ for transformation with our client RMIT University, Australia
  - NETHERLAND : Top Partner in the country
  - FRANCE : Innovation Award (Mulesoft)

aws
- Transformation Award - Germany

SAP
- SAP Pinnacle award 2019 finalist- Customer Experience Partner of the Year.
- 2019 SAP Innovation Partner Award for Capgemini Netherlands
- 2019 SAP Partner Award for Cloud subscriptions and transformation projects for Capgemini Italy
- 2019 SAP Partner Award for Best in Cloud business for Capgemini France

I&D Portfolio Partner

Informatica
- Big Data Partner of the Year Award

sas
- Regional Partner of the Year Award for NW EMEA Region

IBM
- 2018 IBM Beacon Award: Outstanding Cybersecurity Solution

ORACLE
- 2019 Oracle NetSuite Partner of the Year:
  - Vertical Alliance of the Year - Advertising, Media & Publishing
  - Vertical Alliance of the Year - Wholesale
- Oracle PaaS Forum Awards, April 2019:
  - Best API Contributor - Luis Weir
  - Best PaaS Contribution
- Oracle IaaS & PaaS Forum Awards, May 2019
- Top Contribution at the IaaS & PaaS Forum – Chris Hollies, CTO Oracle UK DU