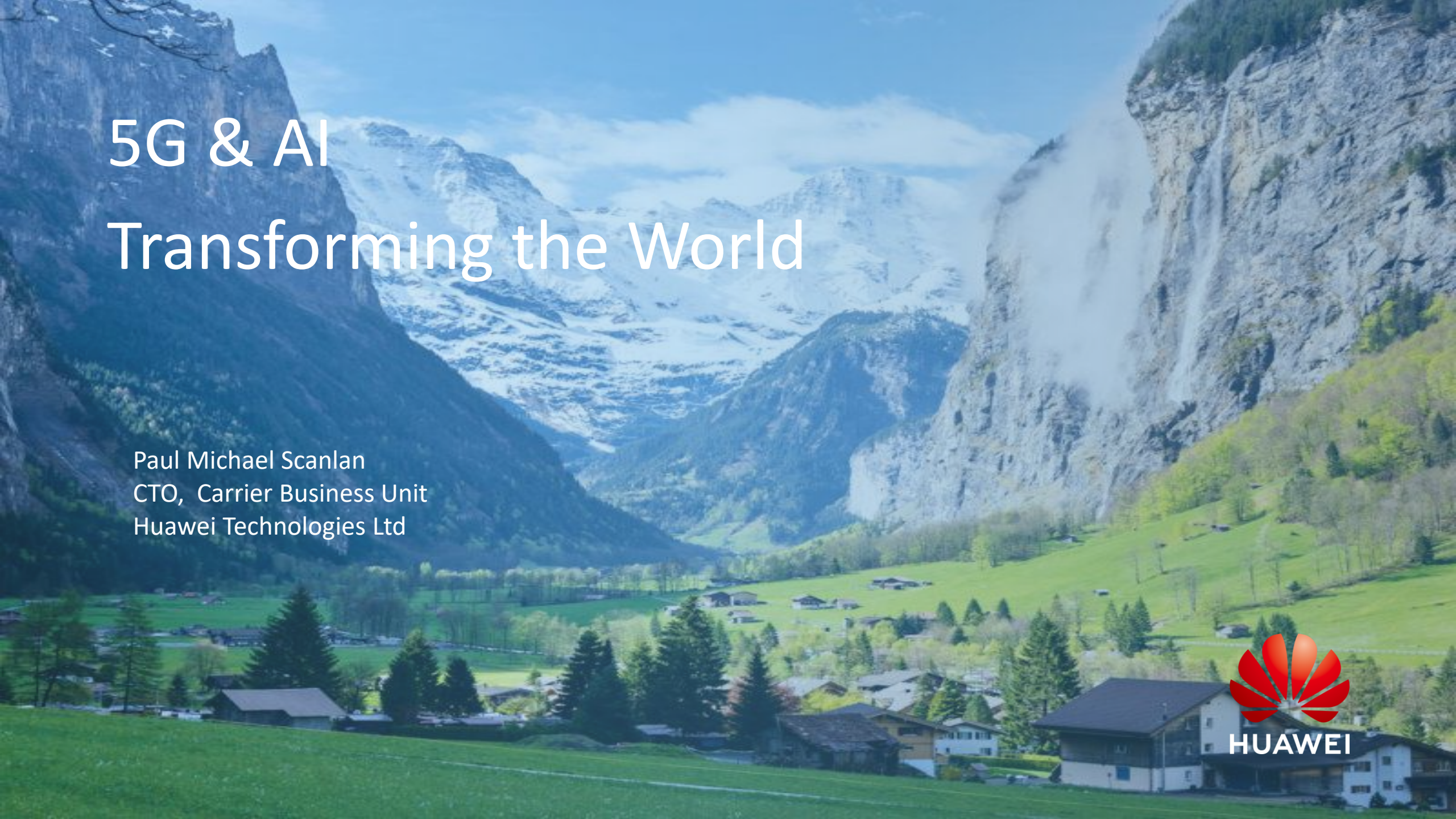

5G & AI Transforming the World

Paul Michael Scanlan
CTO, Carrier Business Unit
Huawei Technologies Ltd

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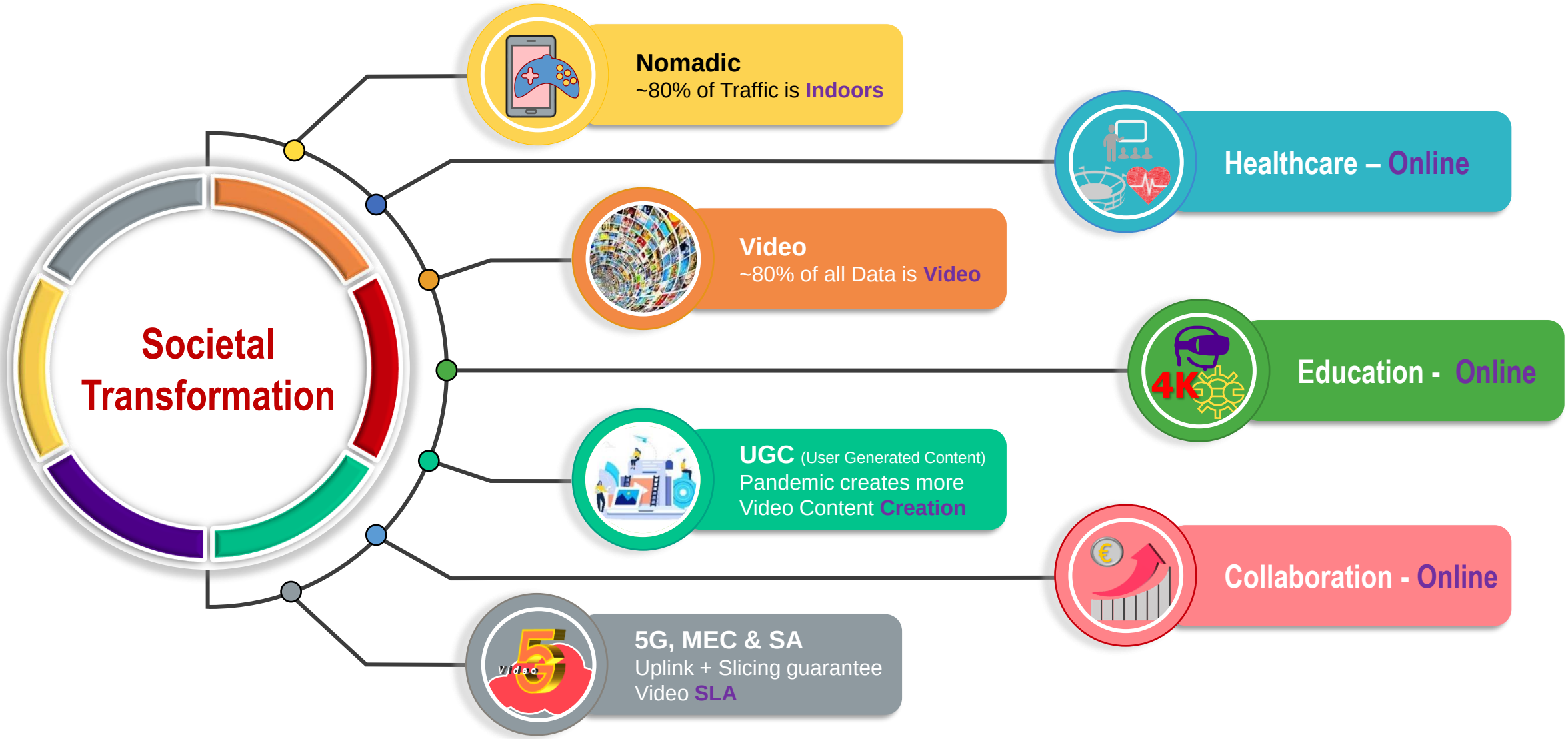
Society Behaviour - Today



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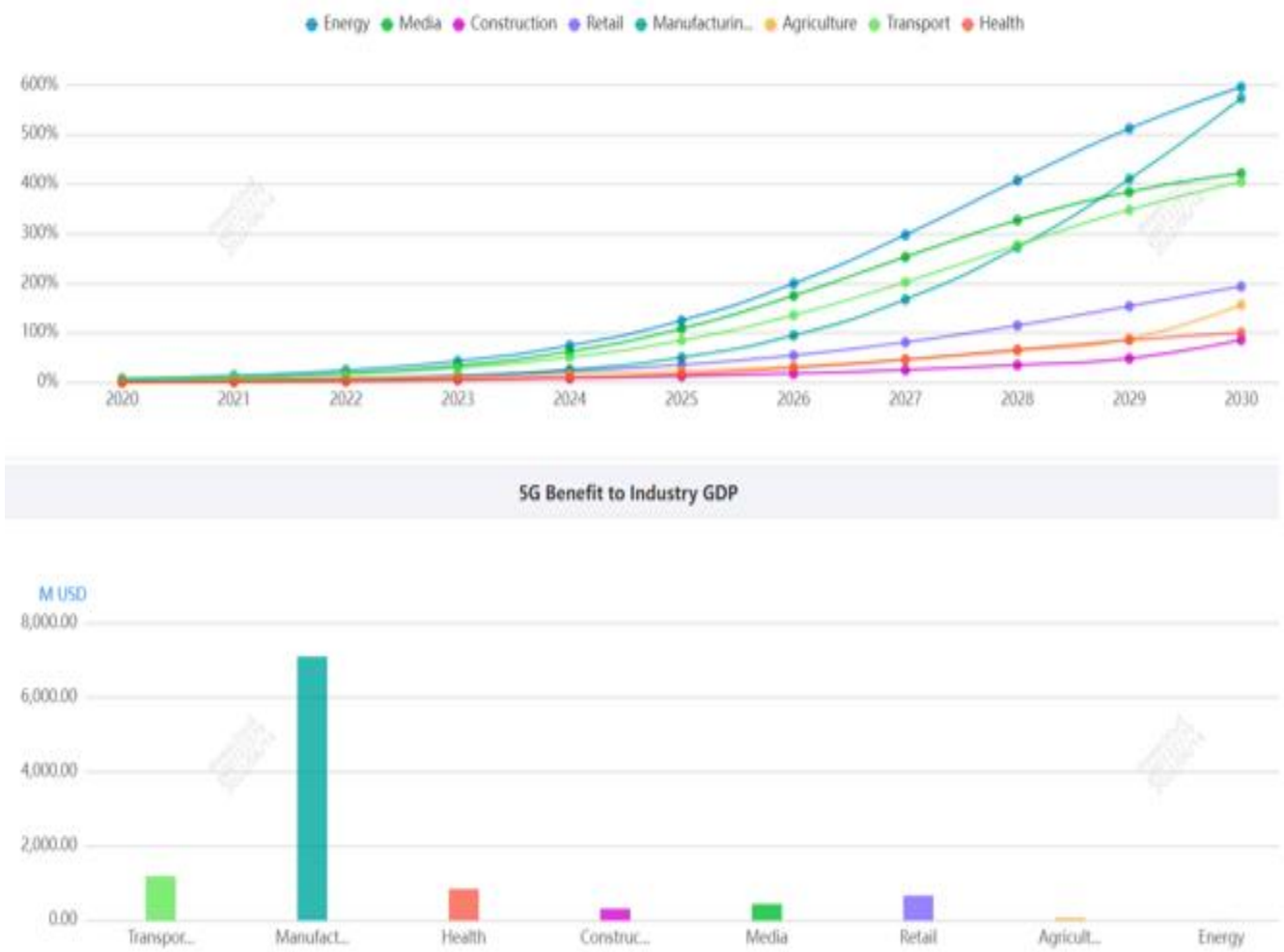
5G & AI Impact on Swiss Economy

GDP Impact by year



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The Intelligent World 2030

Healthcare

Better quality of life

Living spaces

Personalized spaces

Cities

More human, livable cities

Energy

Intelligent, green energy

Enterprises

Reshaping production models

Digital trust

Trusted future

Food

More bountiful, inclusive, and "green" diets

Transportation

Mobile third space

Healthcare

Outlook 1： Making Health Computable, Bettering Quality of Life

Improving overall health, and treatment accessibility and affordability

Past 10 years

5 yrs ⇑ Global life expectancy at birth:

Source: WHO

Next 10 years

16.5% of the global population will be 60 years old or over

Source: WHO

World Health Statistics 2021

17.8% Global premature mortality caused by non-communicable diseases

Source: WHO

Healthcare spending is growing faster than the rest of the global economy

2030 Global Shortfall

5.7m Nurses

18m Health workers

Source: UN

Unbalanced distribution between global population growth & medical resources

2050 Disparity Ratios

3.5 Africa : Europe

0.1 Nigeria: Germany
Physicians / 1,000 people

Source: WHO

Challenges	Expensive medical treatment	Inaccessible medical treatment	Improving people's overall health
Requirements	**Lower healthcare costs**	**Diversified healthcare resources& services**	**New prevention & treatment methods**

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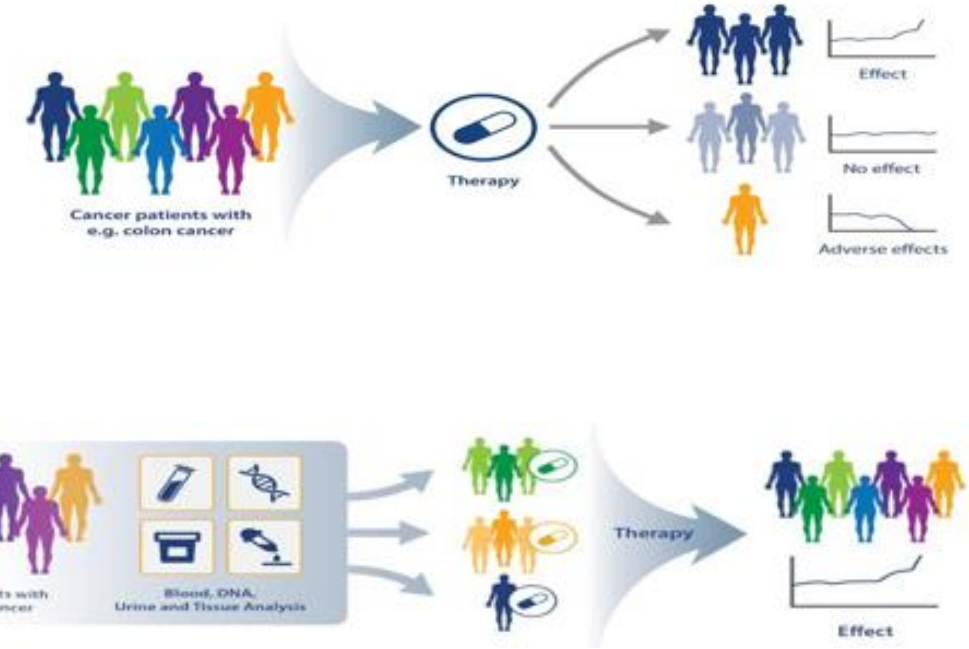
Case study: Making health computable, bettering quality of life

From treatment to prevention

From "one-size-fits-all" to "bespoke"



Value of ICT: Personal health data modeling

Internet, IoT, AI, wearables, and portable monitoring devices

Value of ICT: Personalized treatment plans

An AI-powered pharmaceutical platform that optimizes medication dosages

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Smart Healthcare – Why 5G is Important

Telemedicine


Tele-consultation


Medical Education


Remote Image


Remote Surgery


Auxiliary Operation


Remote Ward Inspection

Emergency vehicle scenarios


Remote Ultrasound


Video Conferencing


AR Glasses

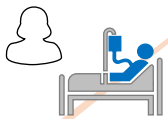

Connected Ambulance

In-Hospital Scenarios


Neonatal Visit


ECG Monitoring


Device Location

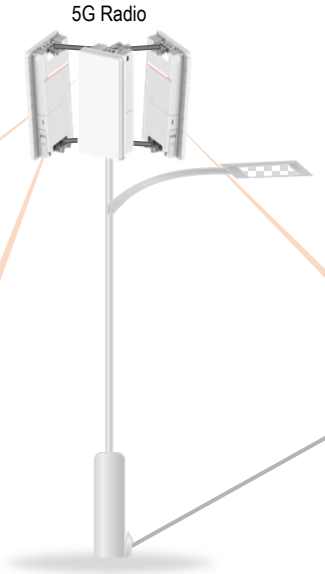

DR, Patient location

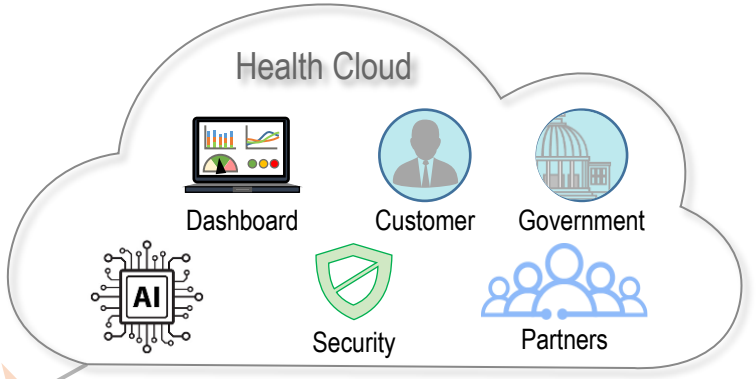

ICU Monitoring & VR Visits


Infusion Monitoring

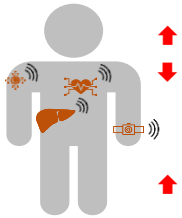

Mobile Nursing Station


Diagnostic Guide Robots





Remote Patient Monitoring


Smart Devices

- Less Travel
- Less wait time
- Treat more patients


Data storage platform

- Less risk of infection
- Better quality of care
- Reduced "Do not Attend" rates
- Increased access to healthcare
- Lower cost per patient

HD Virtual Consultation


Patient

- Less Travel
- Less wait time
- Treat more patients


DR / Healthcare Professional


Video / data storage platform

- Less risk of infection
- Better quality of care
- Reduced "Do not Attend" rates
- Increased access to healthcare
- Lower cost per patient


Patient

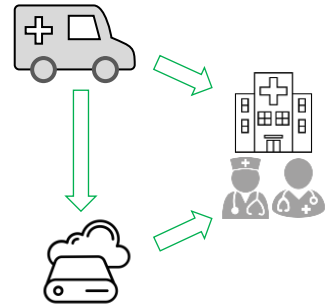

Healthcare Professional


Hospital


Government / Insurer

Connected Ambulance

- Faster Diagnostics
- Less wait time
- Treat more patients
- Increased patient insights
- Meet A&E targets
- Decreased "downtime" for ambulances
- Decreased cost per patient treated
- Decreased mortality



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Energy

Outlook 2： Intelligent, Green Energy for a Better Planet

Driving transformation of the energy mix and improving energy network flexibility

By 2030

Renewable became the major Power source

42% Renewable energy's share in power generation

Source: IRENA

By 2030

Electricity increasing used in industry to phase out fossil fuel

20⇨30% Proportion of electricity in global energy consumption

Source: IRENA

By 2030

Energy efficiency is improving

100% global energy efficiency improvement

Source: Transforming Our World: The 2030 Agenda for Sustainable Development

Challenges	Share of new energy in the energy mix	Flexibility of energy networks	Going low carbon in data centres & networks
Requirements	**Using sustainable energy**	**Addressing the intermittency of new energy networks**	**Reducing carbon emissions of the ICT industry**

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Case Study: Intelligent, green energy for a better planet

Offshore power plants

Value of ICT:

Offshore wind turbines
Offshore wind power technology

Offshore FPV plants
Solar cells in 3 forms: Thin-film; submerged; floating arrays

Energy cloud

Value of ICT:

Operating system for the Energy Internet

Manufacturing

Outlook 3： New Productivity, New Production Models, New Resilience

5G & AI Impact on Industry Sectors in Switzerland by 2030

Health

Patients Treated		Use Case
4.36m	⇧ 8%	Remote Patient Monitoring
3.38m	⇧ 5%	HD Virtual Consultation
188k	⇧ 1%	Connected Ambulance

- ⇩ Fewer days in hospital
- ⇩ Less Wait time
- ⇩ Reduced do not attend rates
- ⇩ Lower cost per patient
- ⇧ Better quality healthcare
- ⇧ Increased self-care
- ⇧ Faster diagnosis
- ⇧ Higher patient through-put
- ⇧ Healthier population

Manufacturing

GDP Contribution		Use Case
$610m	⇧ 0.4%	Advanced predictive maintenance
$2.2bn	⇧ 1.8%	Augmented reality & remote expert
$2.8bn	⇧ 1.4%	Precision monitoring & control

- ⇩ Reduce $$ on repair & maintenance
- ⇩ Reduced defects & spend on Q.C.
- ⇩ Reduced unplanned downtime
- ⇩ Reduced waste
- ⇩ Lower cost per patient
- ⇧ Increased up-time, productivity
- ⇧ Increased Effectiveness
- ⇧ Focused Intervention
- ⇧ Improved Health & Safety
- ⇧ AR / VR Training

Energy

GDP Contribution		Use Case
$xm	⇧ 6%	5G contribution to Energy

- ⇧ Accelerated adoption of renewable-energy generated electricity
- ⇧ Accelerated replacement of hydro-carbon generated electricity
- ⇧ New generation of use cases improve competitiveness
- ⇧ Increased energy efficiency across society & Business

Source: STL Partners

Digital Trust

Outlook 4： Technologies and Regulations Shape a Trusted Digital Future

Building digital trust for secure, trustworthy digital services

2030 Global Shortfall

$54.26m Average cost of a dispute in the construction sector

13.4 mths Average length of a dispute

Source: Arcadis

Rampant Deep-fake Issues

$243,000 Lost by UK-based energy firm executive - deceived by mimic voices

Source: *The Washington Post*

Challenges

Digital trust issues, including issues in key domains like privacy, security ,identity, transparency, data integrity and governance, and compliance

Requirements

Dual-drivers of "ICT technologies + Regulations"

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Case Study: Technologies & regulations shape a trusted digital future

Using AI to identify fraud

Value of ICT:

Using AI to identify fraud
Neural networks for deep learning and automated defense systems based on machine learning and API technology

Rules redefine digital trust

New mechanisms for collecting personal information online

Education

Outlook 5： Digital Remote Education for all

Education & Scientific Research Institution Transformation

Receiving education only in classrooms

Interactive Learning On-line Learning

Rapid campus development Restricted access to educational resources

Extensive Platform enriches learning resources

High Operation & Management Cost

Smart campus management

Low-speed network, unable to support scientific research

High-speed learning anytime & anywhere

Aged & Isolated IT Systems

High-performance IT system with optimized resources

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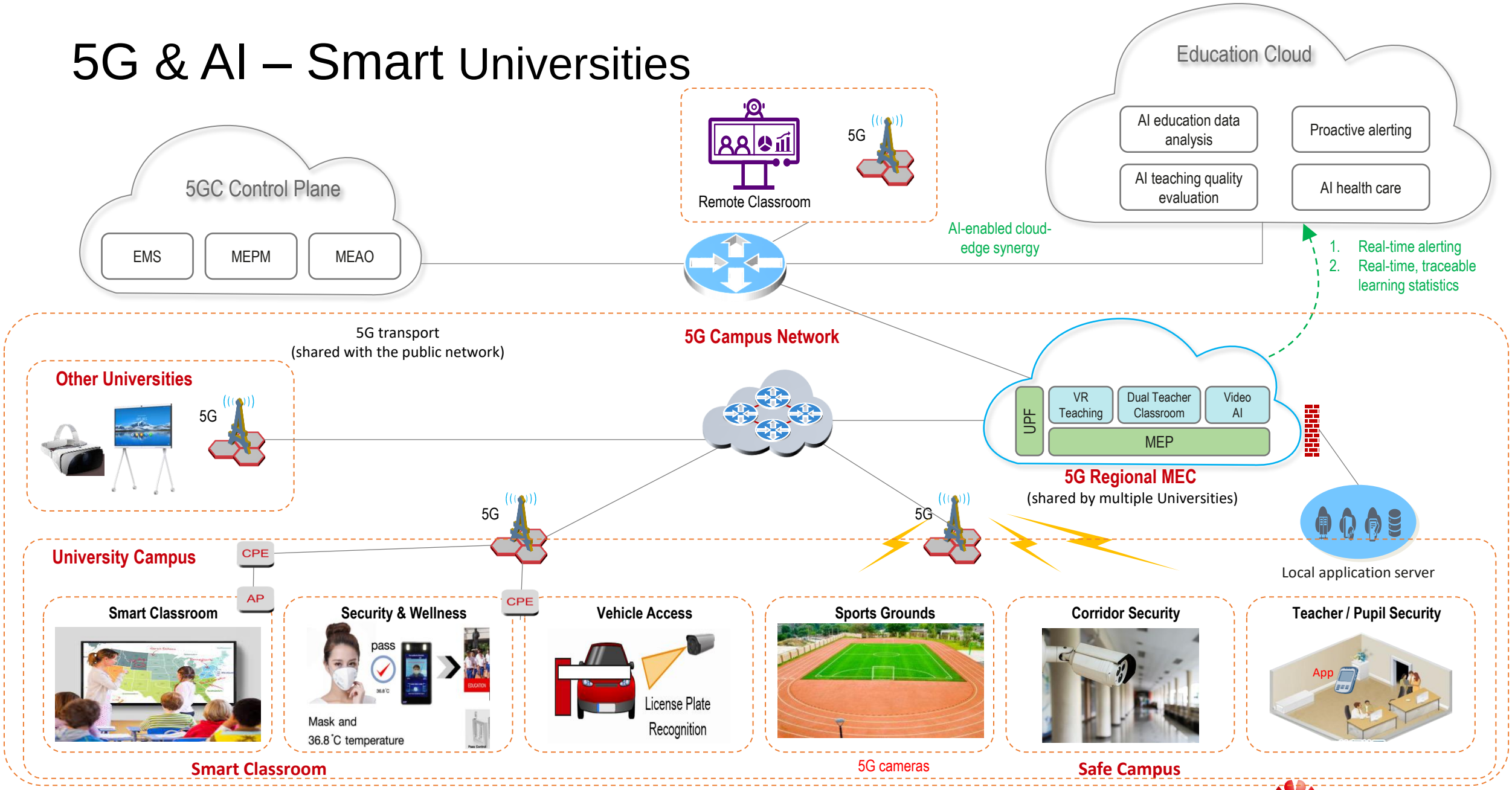
5G & AI – Smart Universities



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CTO Office

Chief Transformation Office

Thank you

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