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University of London

Science and Engineering

Digital Twins: A promising way to enable Sustainable Development Goals (SDG)

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IEEE Smart World Congress

What are Sustainable Development Goals?



UN defined 17 SDG to be met by 2030



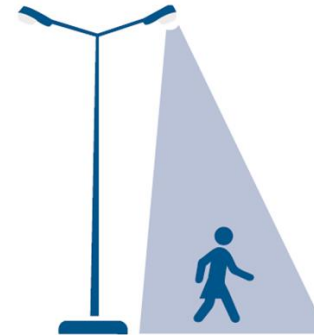
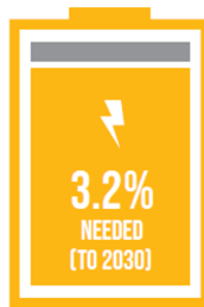
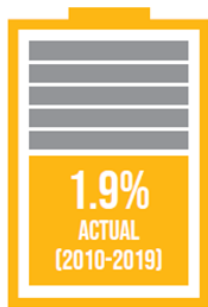
SDG summit



2023 is the midpoint to 2030, **how are we doing?**

PROGRESS IN ENERGY EFFICIENCY
NEEDS TO SPEED UP
TO ACHIEVE GLOBAL CLIMATE GOALS

ANNUAL ENERGY-INTENSITY IMPROVEMENT RATE

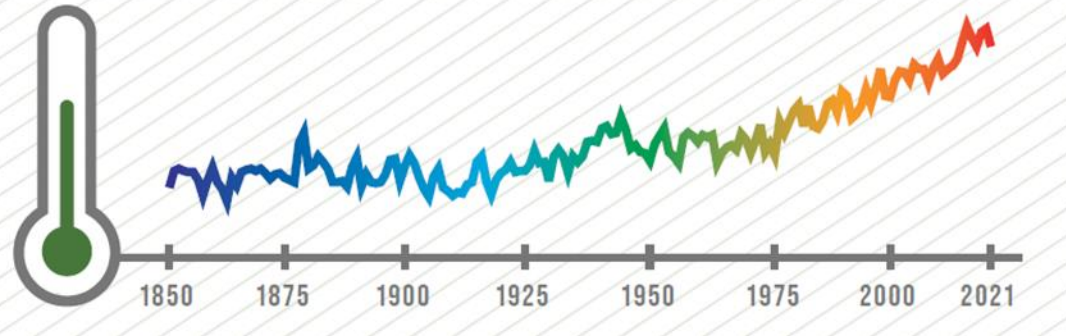


1/3 OF THE WORLD'S POPULATION
MOSTLY WOMEN
FEAR WALKING ALONE IN
THEIR NEIGHBOURHOODS AT NIGHT

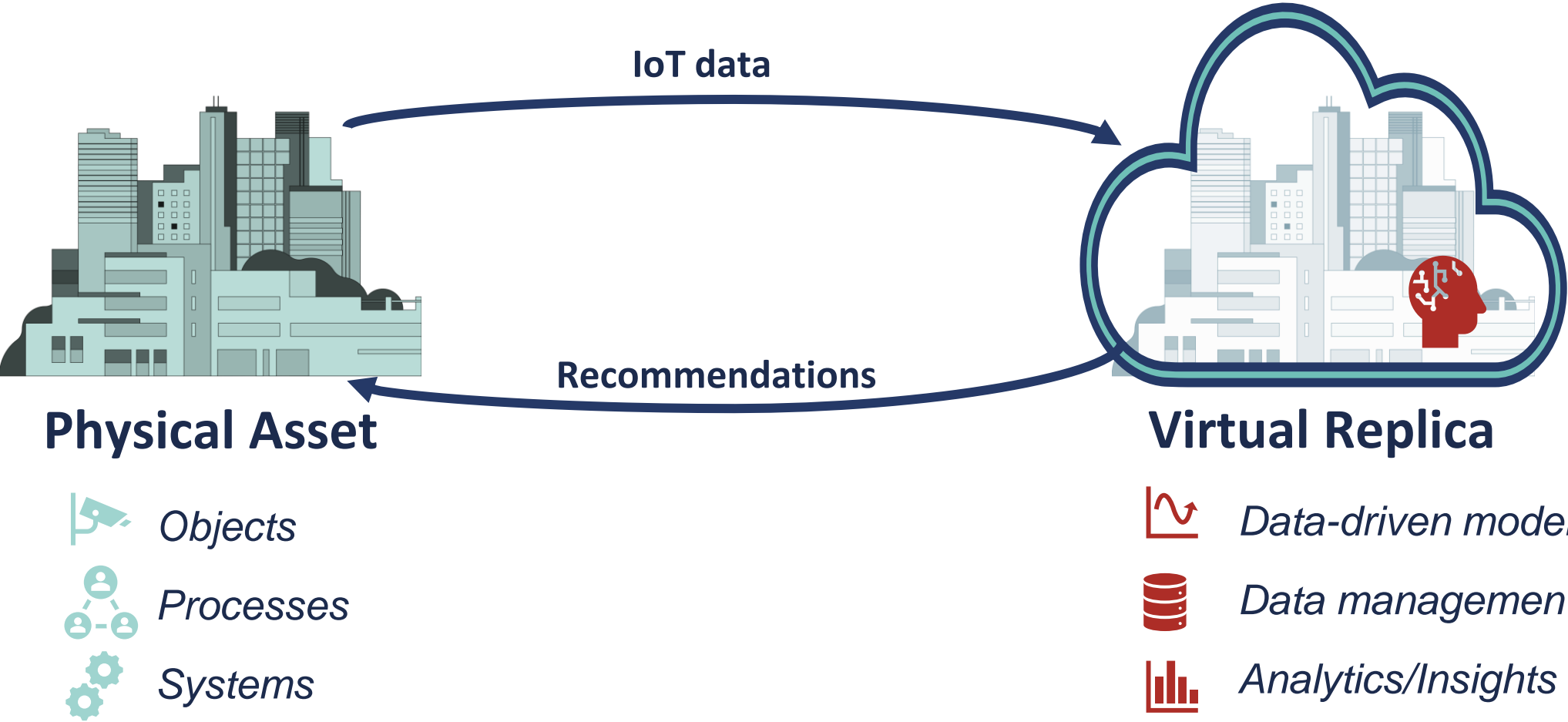


99%
OF THE
WORLD'S URBAN
POPULATION BREATHE
POLLUTED AIR

RISING GLOBAL TEMPERATURES
CONTINUE UNABATED, LEADING
TO **MORE EXTREME WEATHER**



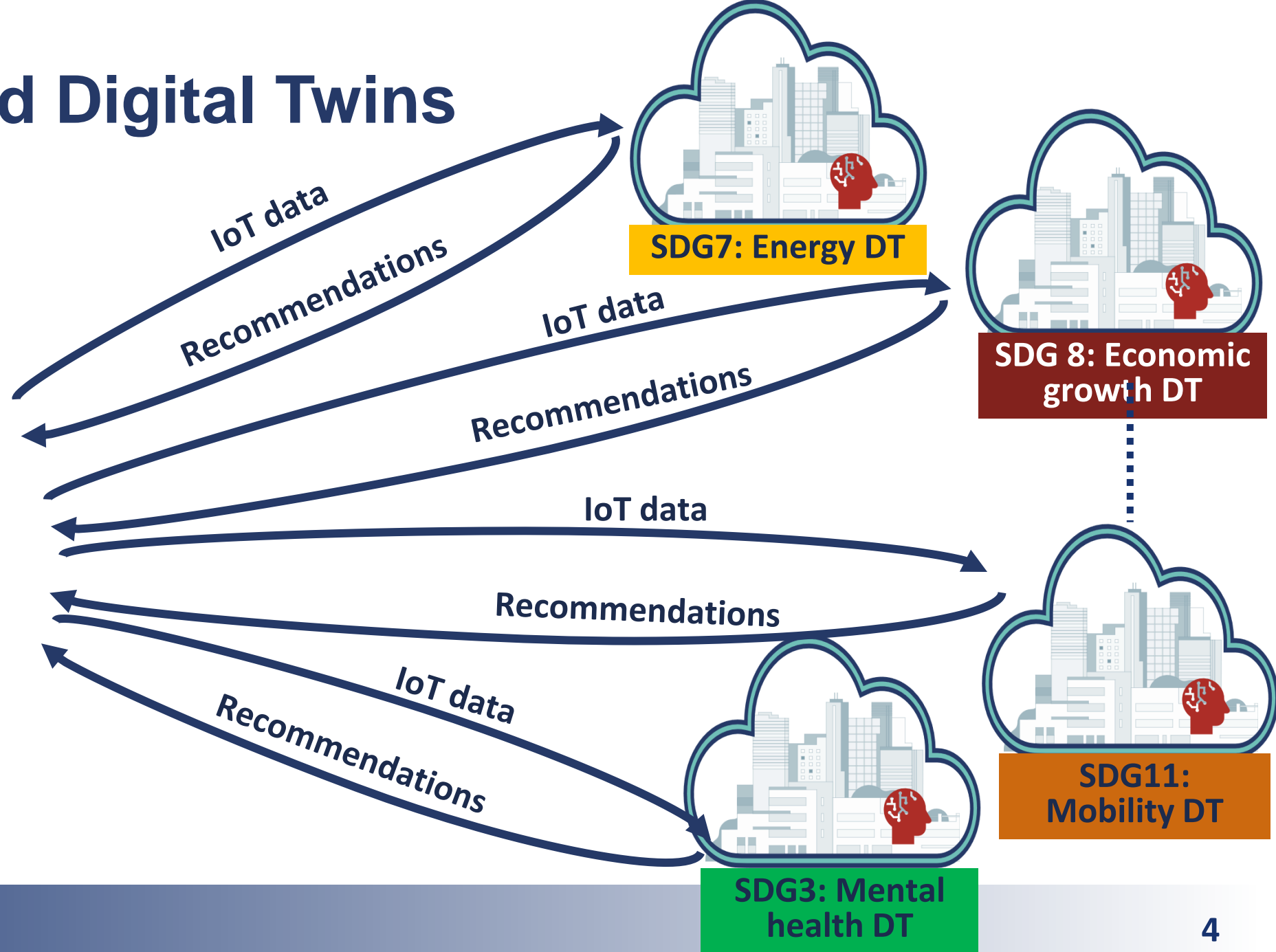
Why Digital Twins? **Reliable and cost-effective anticipatory SDG solutions**



Focused Digital Twins



Physical Asset



Focused Digital Twins can be misleading...

- London lockdown halved levels of harmful air pollutants but was disastrous for the economy, mental health, equitable & inclusive education, inequalities...
- Increased gas prices resulted in reduced gas consumption despite a colder fall in Q1 2023, should we increase the prices more to reduce energy consumption?
- School street initiatives, LTN, ULEZ, are great initiatives for improving air quality and road safety but could be perceived as bad for local businesses and disruptive to motorists!





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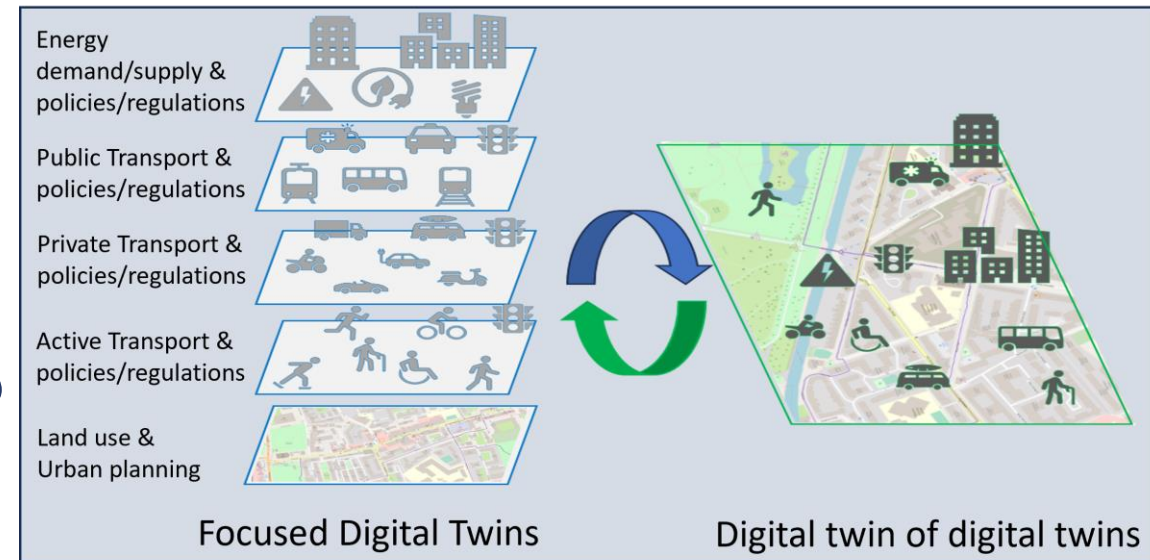
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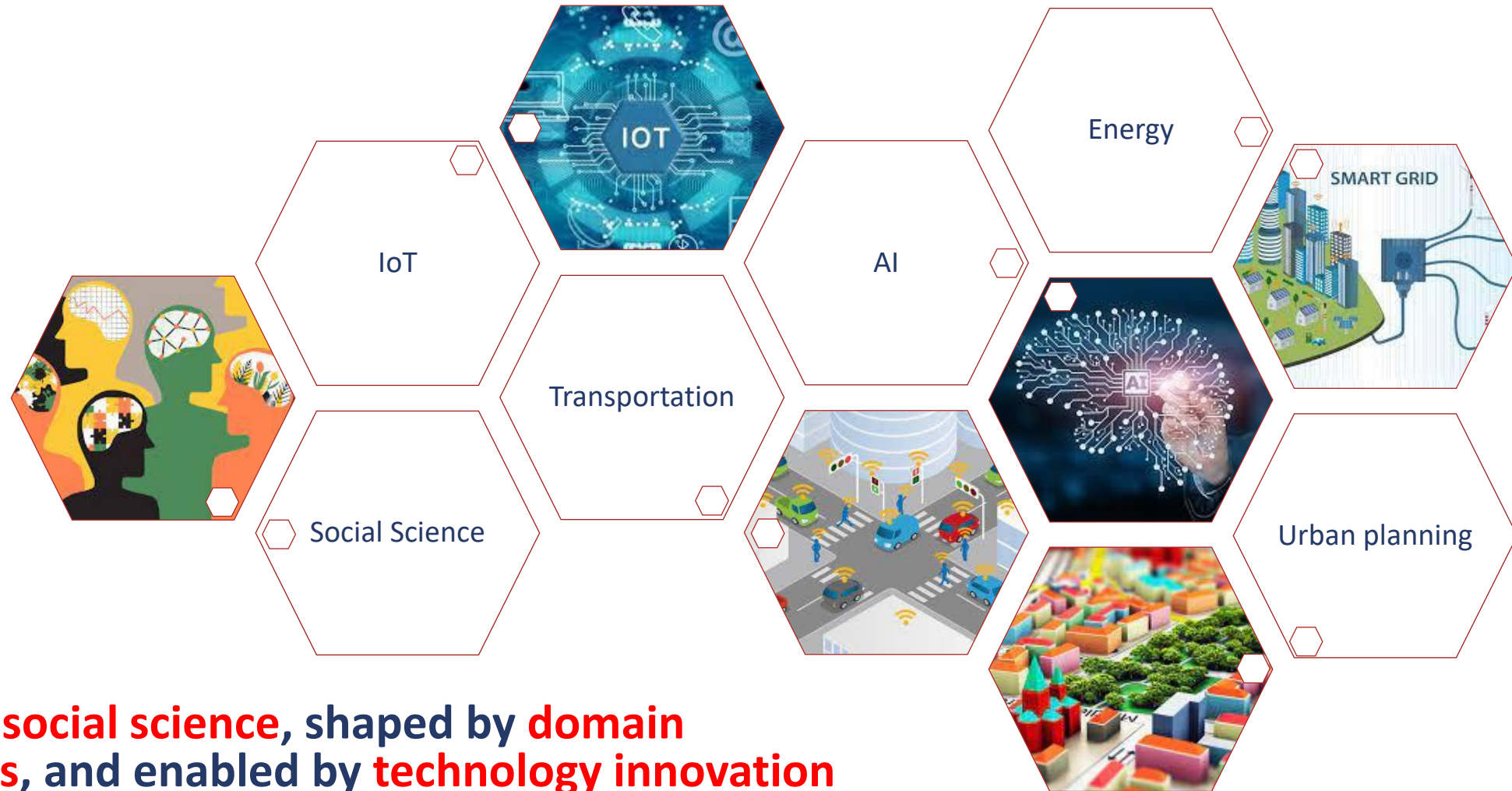
Digital Twins for Sustainable Development Goals

<https://www.qmul.ac.uk/dtsdg/>

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DT4SDG – Multidisciplinary approach



led by **social science**, shaped by **domain experts**, and enabled by **technology innovation**



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