

Demonstrating The Operational Value of Digital Twins for Pharma 4.0

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About the presenters



Anne BARD - Design Lead
Front End Engineering and Design

I am an inspiring and passionate design & transformation leader driven by relentless curiosity and by the pursuit of hidden business value.

I believe in connecting people, trends and data to find patterns and transform this understanding into actionable plans.

My lifelong mission is to catalyze people chemistry to enable sustainable collaboration.



Giovanni Giorgio - Senior Digital Engineer
Front End Engineering and Design

Chemical Engineer by background with a strong passion for decisions support systems using data, modelling and simulation.

Driven by the vision to simplify design and operation decisions through the implementation of industrial digital twin.



Shakeel Mirza
Senior Business Development Manager

For the last twenty years, I've been working in the engineering software industry in different roles focused at helping the early adopters be successful with the latest technology. I've worked for market leading engineering software MCAD, PLM & BIM providers such as Autodesk, Dassault Systèmes, Unigraphics (now Siemens PLM), ANSYS and Robobat. I'm helping the engineering design industry in their digital transformation through my deep engineering knowledge complemented with strong strategic analysis, leadership skills and business acumen, thanks to my vision broadening experience of an executive EMBA at HEC #1 worldwide by FT with Major in "Innovation Management & Entrepreneurial Leadership".

The 5 Objectives of This Class



1. Clarify the value of digital twins in a “Pharma 4.0” context

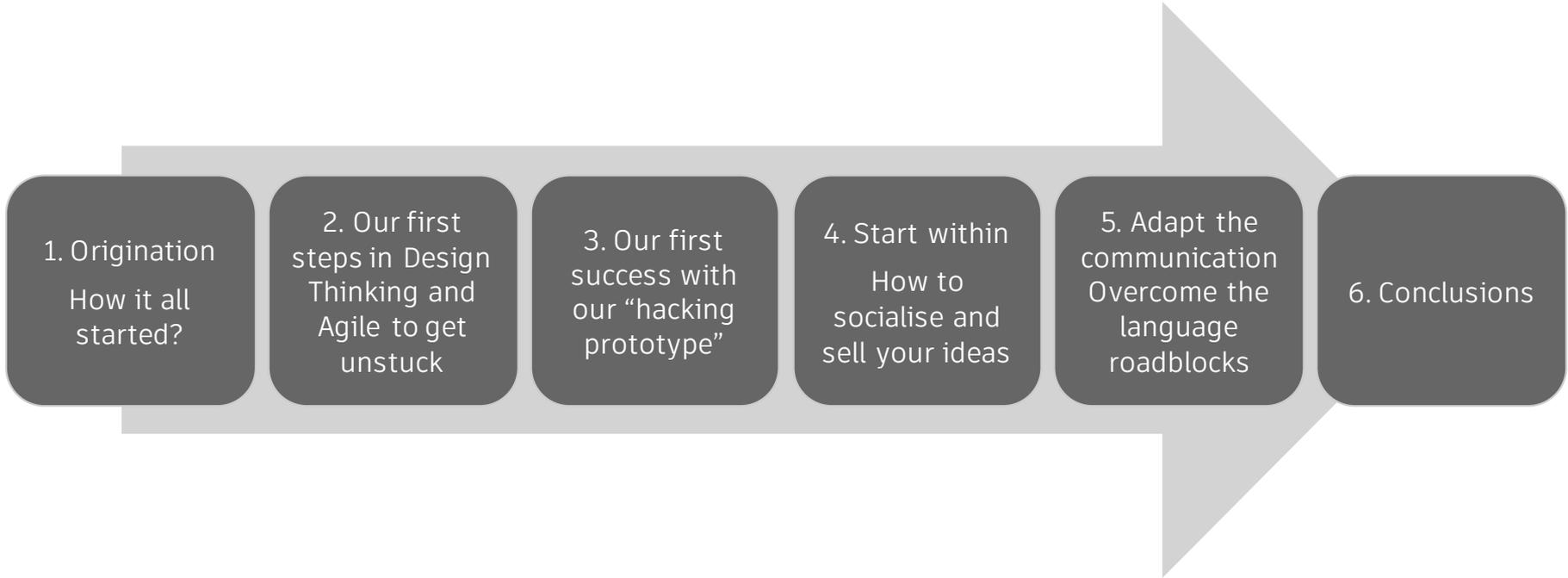
2. Design Thinking & Agile methodology to define & solve abstract problems

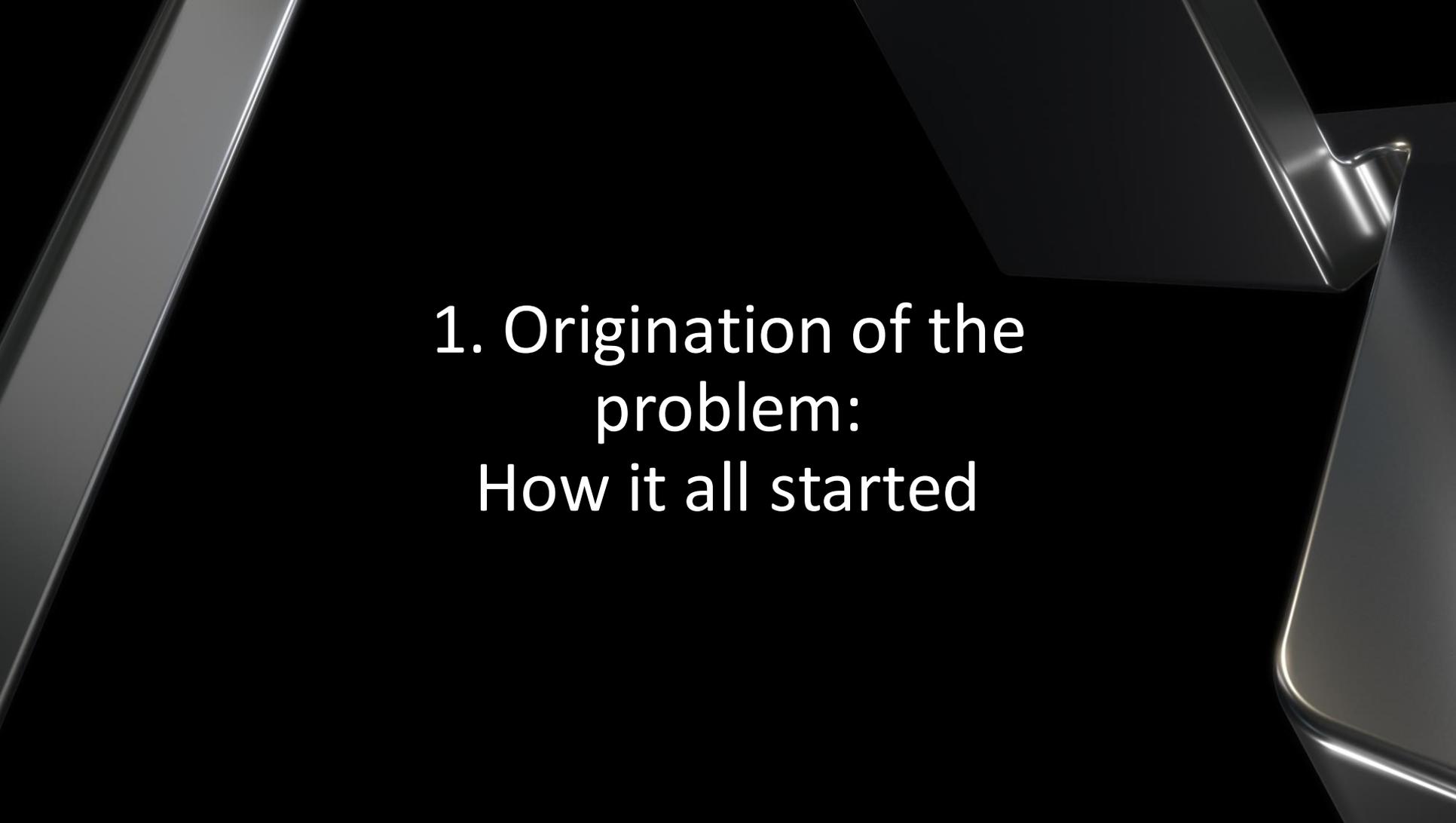
3. How to use a “hacking approach” to build the first prototype and test hypothesis

4. How to link the business needs with information exchange technology

5. Start-Up mindset to enable innovation « from within the org ».

Agenda





1. Origination of the
problem:
How it all started

Some Words about GSK



GSK around the world

>94,000

employees across
96 countries

£9.7bn

sales of innovative
New and Specialty
products now account
for more than half of
pharmaceutical sales

6.6bn

packs of medicines ,
doses of vaccines and
consumer healthcare
products delivered

£250m

contributed globally to
community initiatives



Some Words about GSK

Pharmaceuticals

Our Pharmaceuticals business has a broad portfolio of innovative and established medicines in respiratory, HIV, immuno-inflammation and oncology. We are strengthening our R&D pipeline through a focus on immunology, human genetics and advanced technologies to help us deliver transformational new medicines for patients.

£17bn

Sales 2020

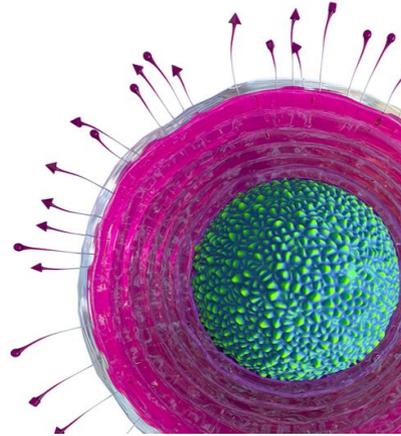
Top sales performers 2020

Respiratory

HIV

Immuno-inflammation

Oncology



Consumer Healthcare

Our world-leading Consumer Healthcare business combines science and consumer insights to create innovative everyday healthcare brands that consumers trust and experts recommend for oral health, pain relief, cold, flu and allergy, digestive health and vitamins, minerals and supplements.

£10bn

Sales turnover 2020

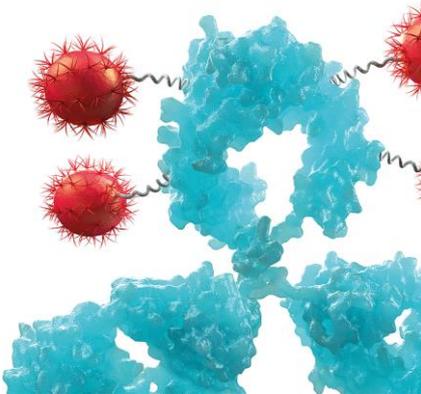
Top sales performers 2020

Pain relief

Respiratory

Therapeutic oral health

Vitamins, minerals and supplements



Vaccines

We are the world's largest vaccines company by revenue, delivering vaccines that help protect people at all stages of life. Our R&D focuses on developing vaccines against infectious diseases that combine high medical need and strong market potential.

£7bn

Sales 2020

Top sales performers 2020

Flu

Shingles



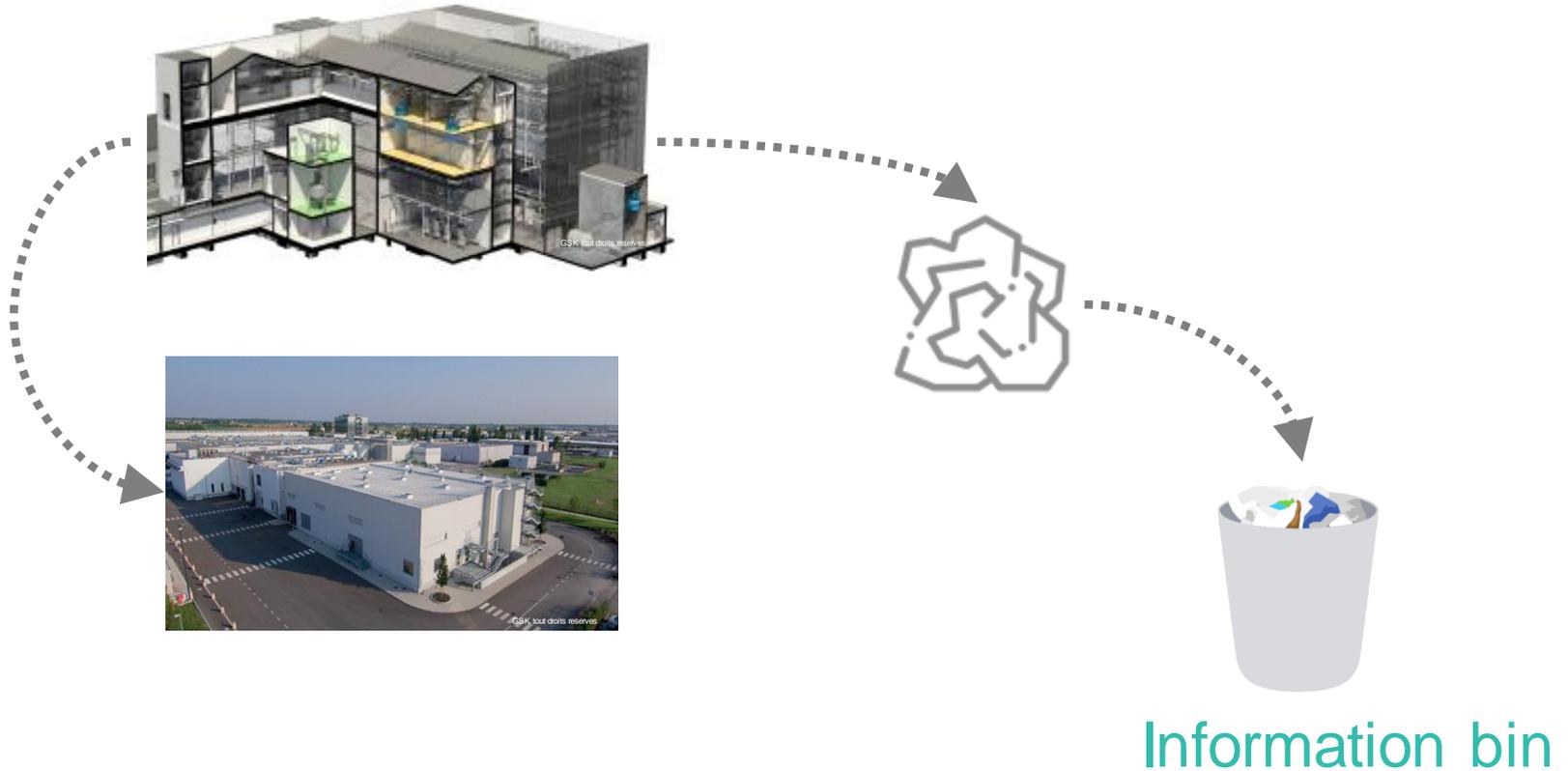
What is the mission of the FEED department?



*map displays site-based projects only

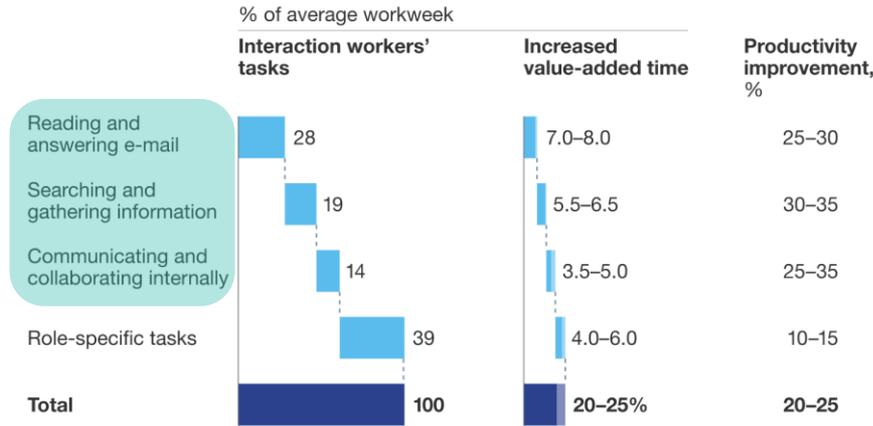
FEED: Front End Engineering and Design

How it all started: the origination



Ironically... the workforce spends 61% of its time in communicating information or in looking for information.

Improved communication and collaboration through social technologies could raise the productivity of interaction workers by 20 to 25 percent.



Source: International Data Corporation (IDC); McKinsey Global Institute analysis



We call it the hidden factory

Pharma 4.0 challenges & Digital Twin

DEFINITION INTRODUCTION

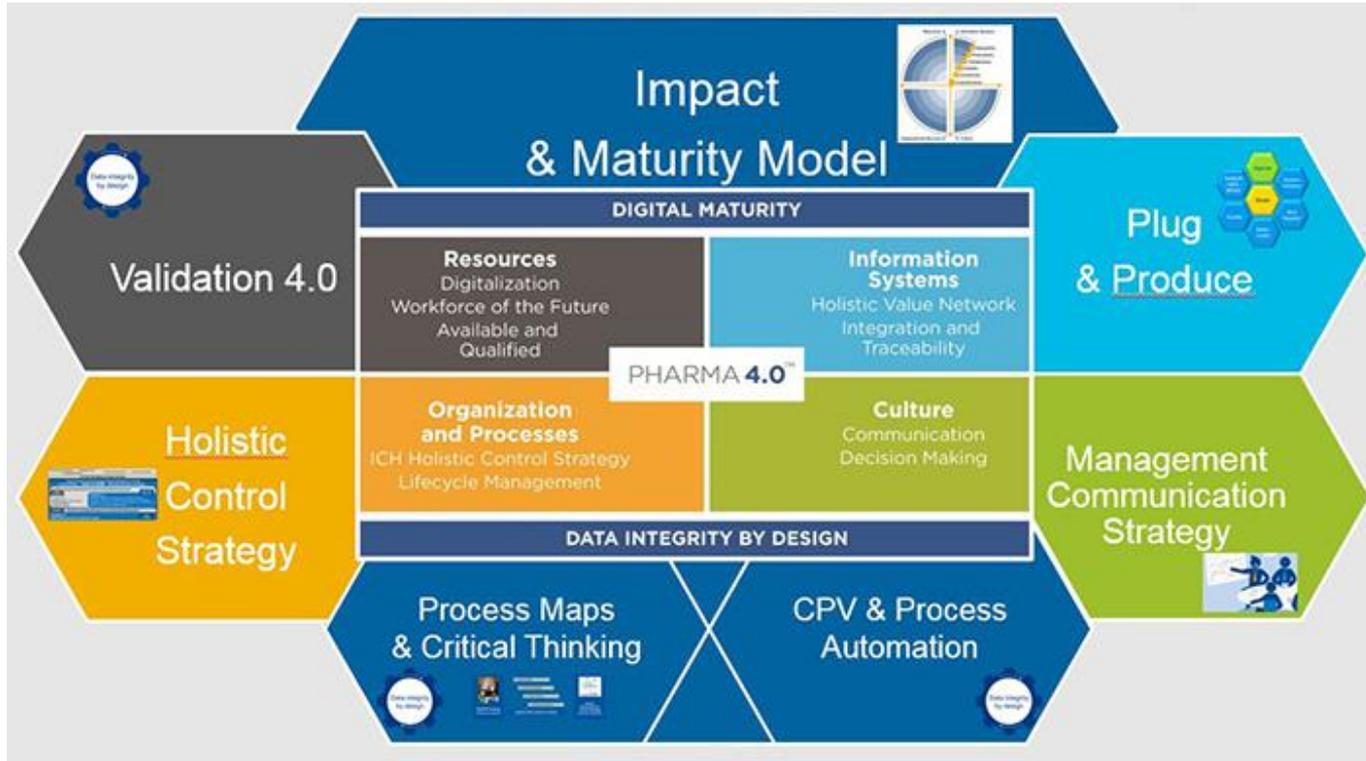
Industry is currently burdened by competing definitions, misunderstandings, and confusion around what a digital twin is and what it can do.

UNFORTUNATELY, THIS CONFUSION
HOLDS US BACK

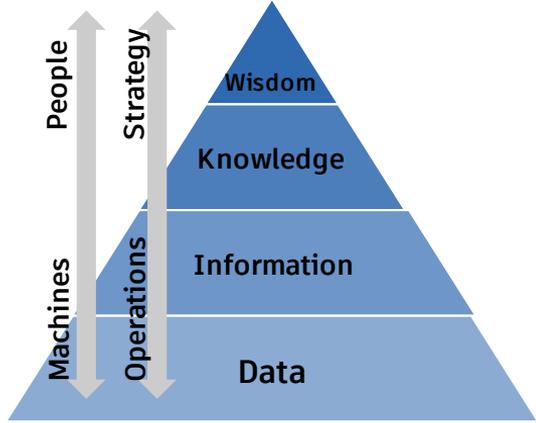
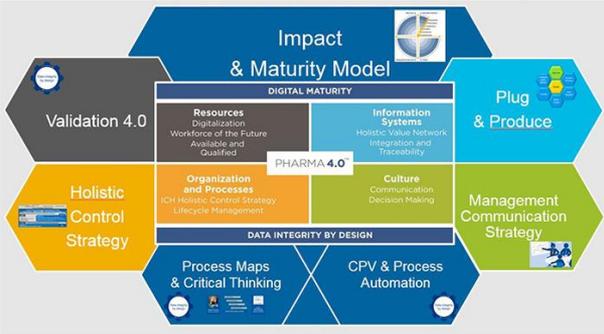


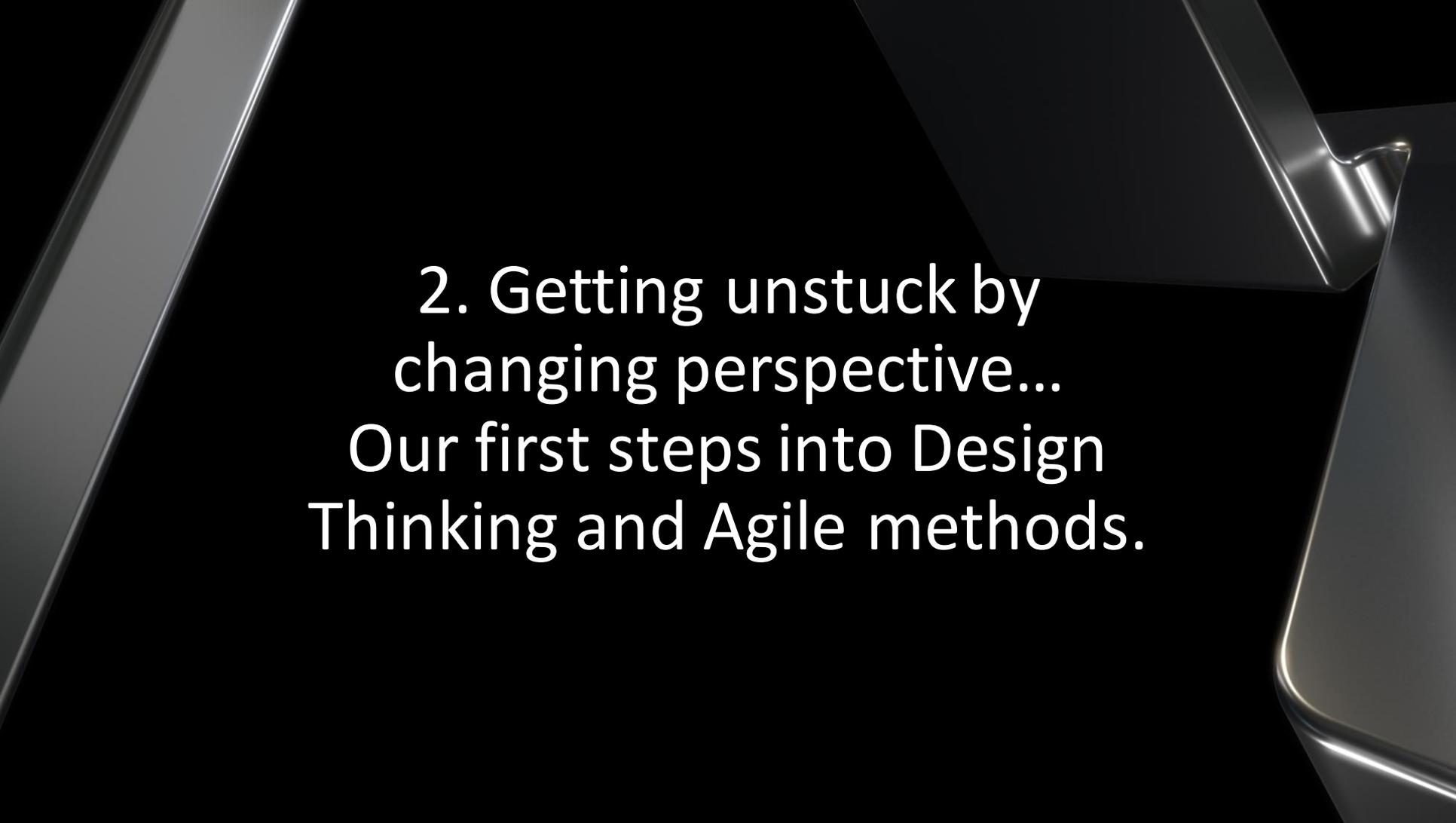
It is a means not an end!

Pharma 4.0 challenges & Digital Twin DEFINITION INTRODUCTION



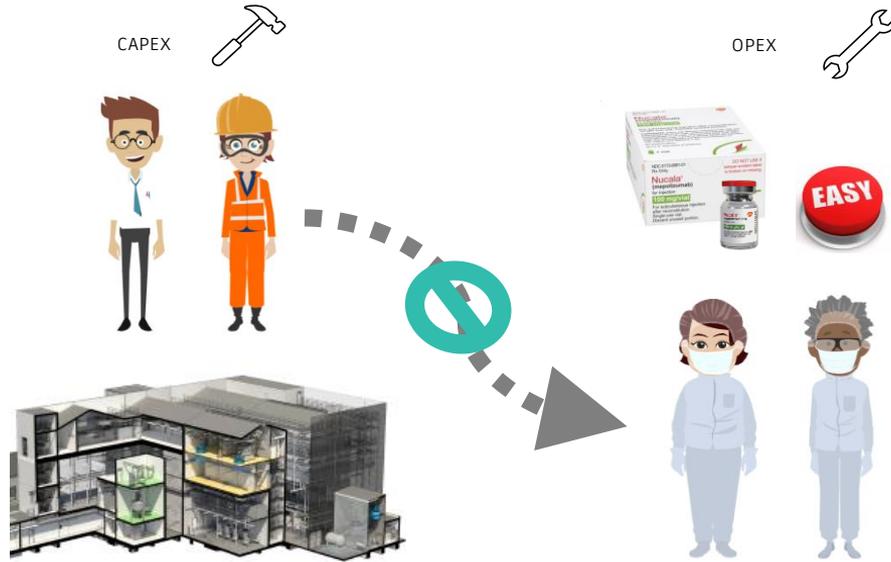
Pharma 4.0 challenges & Digital Twin DEFINITION INTRODUCTION





2. Getting unstuck by
changing perspective...
Our first steps into Design
Thinking and Agile methods.

1st step was looking at the problem from a different perspective



Human Centric \neq Software & Platform Centric

2nd step was to approach technology differently by breaking down the problem

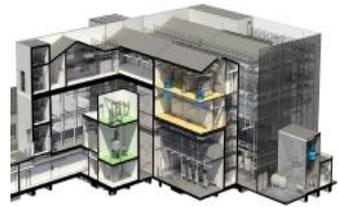


The “App” approach is simple: give to the user a mini-solution fit for his/her use-case and no more:

- Visualisation
- Dashboard
- Task tracking & Mapping
- Ticketing
- Notepad
- Etc...

The « App » to « Use Case » approach was naturally leading us toward Agile thinking: « delivering quality to the customer early and often »

3rd step is to glue the Human, Physical & Digital and Data exchange in the simplest way possible



- 3D geometry
- Spatial localisation
- Engineering description
- Documents

GLUE:
"Truth overlay & mesh-up"

- Product & Operations
- Sensors
- Performance Management
- Tasks & Priorities



- Resources planning
- Asset Management & Maintenance
- Compliance



They run it

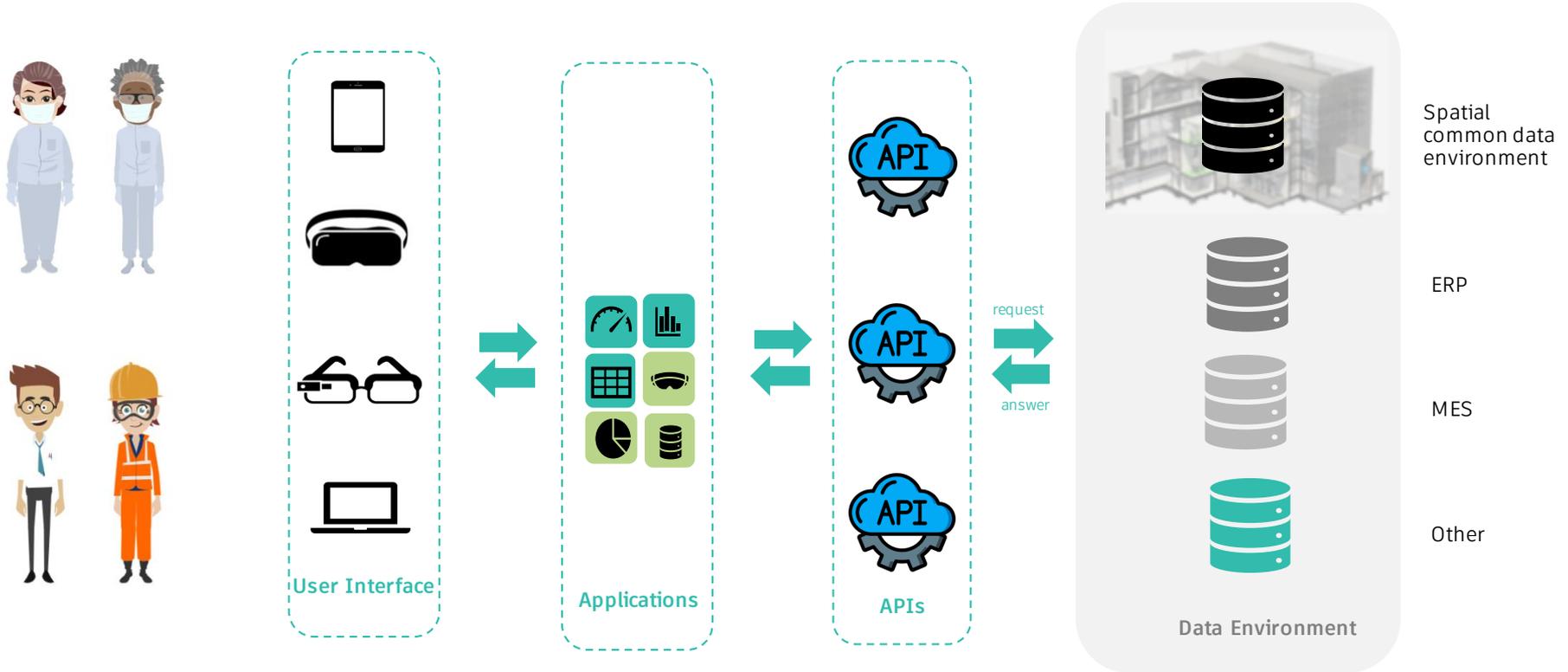


They all need it for fit for purpose use cases:



With one universal concept: **find the right information** at the right time

What does “glue” mean technology speaking?



Workflow coordination enables connection of processes, teams and digital systems



Outcomes

- ✓ Greater agility
- ✓ Higher productivity
- ✓ Improved risk management
- ✓ Better stakeholder satisfaction

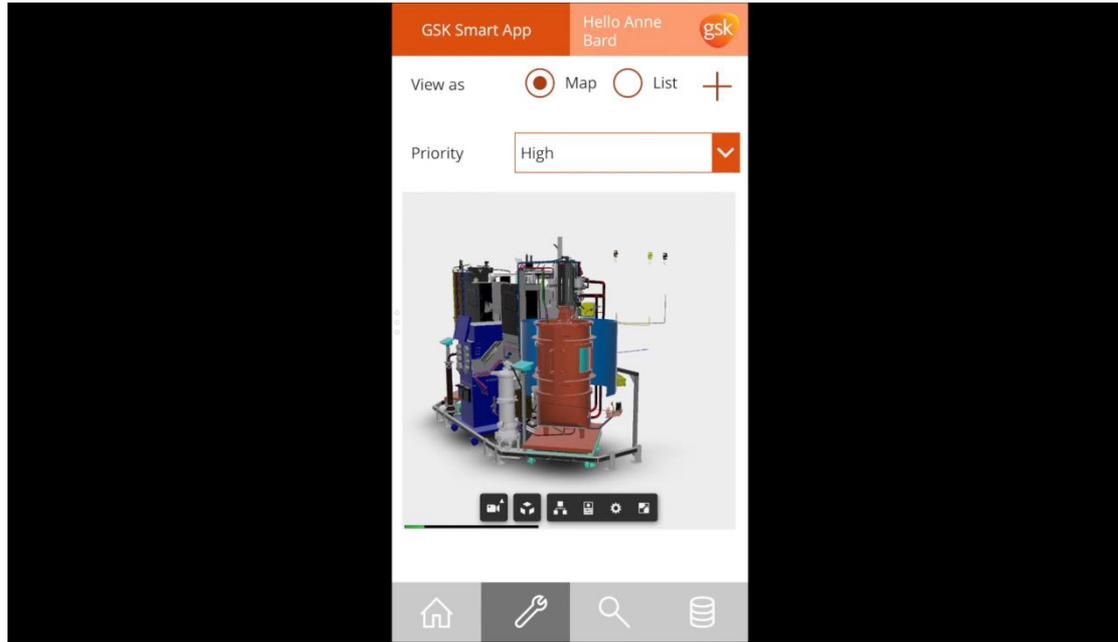


3. Designing a prototype:
Our first steps into the
“hacking approach”.

Dec 2019-Jan 2020: Prototyping kick-off « hack » mindset



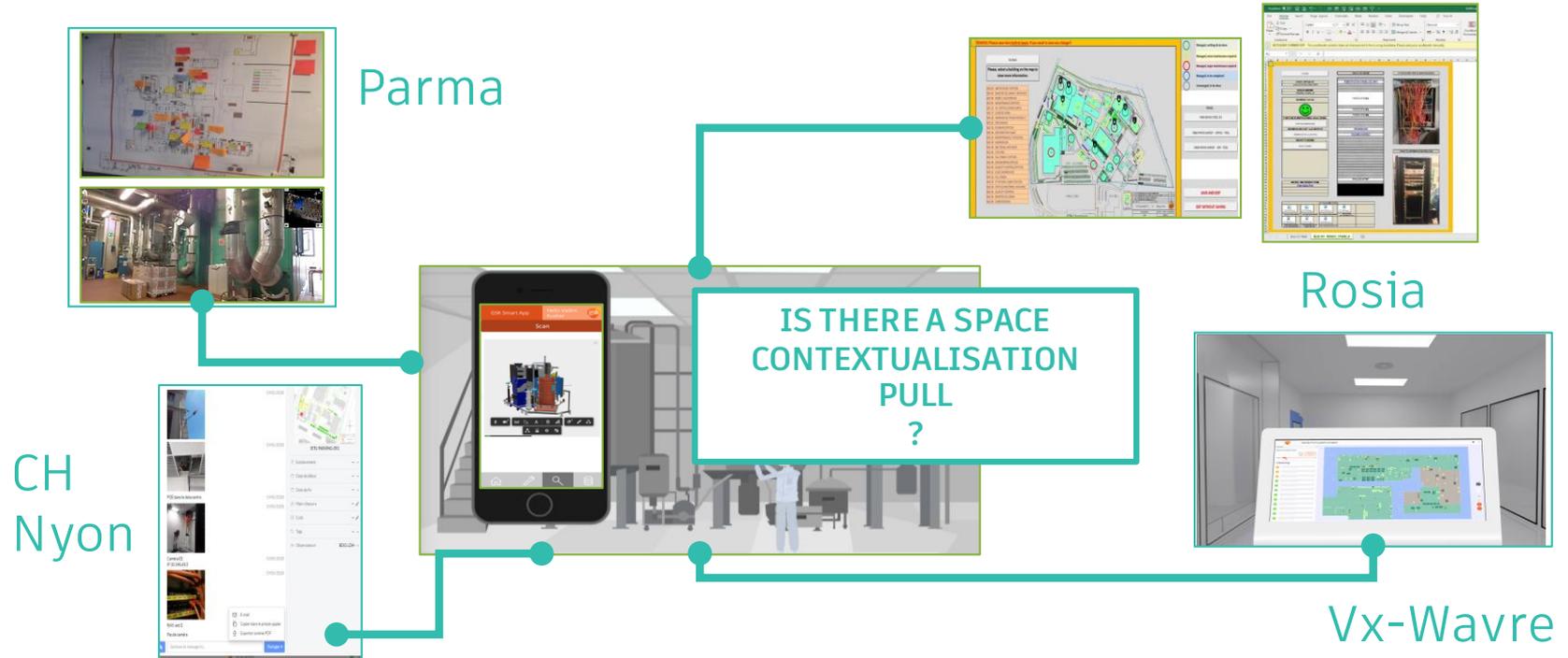
A short video



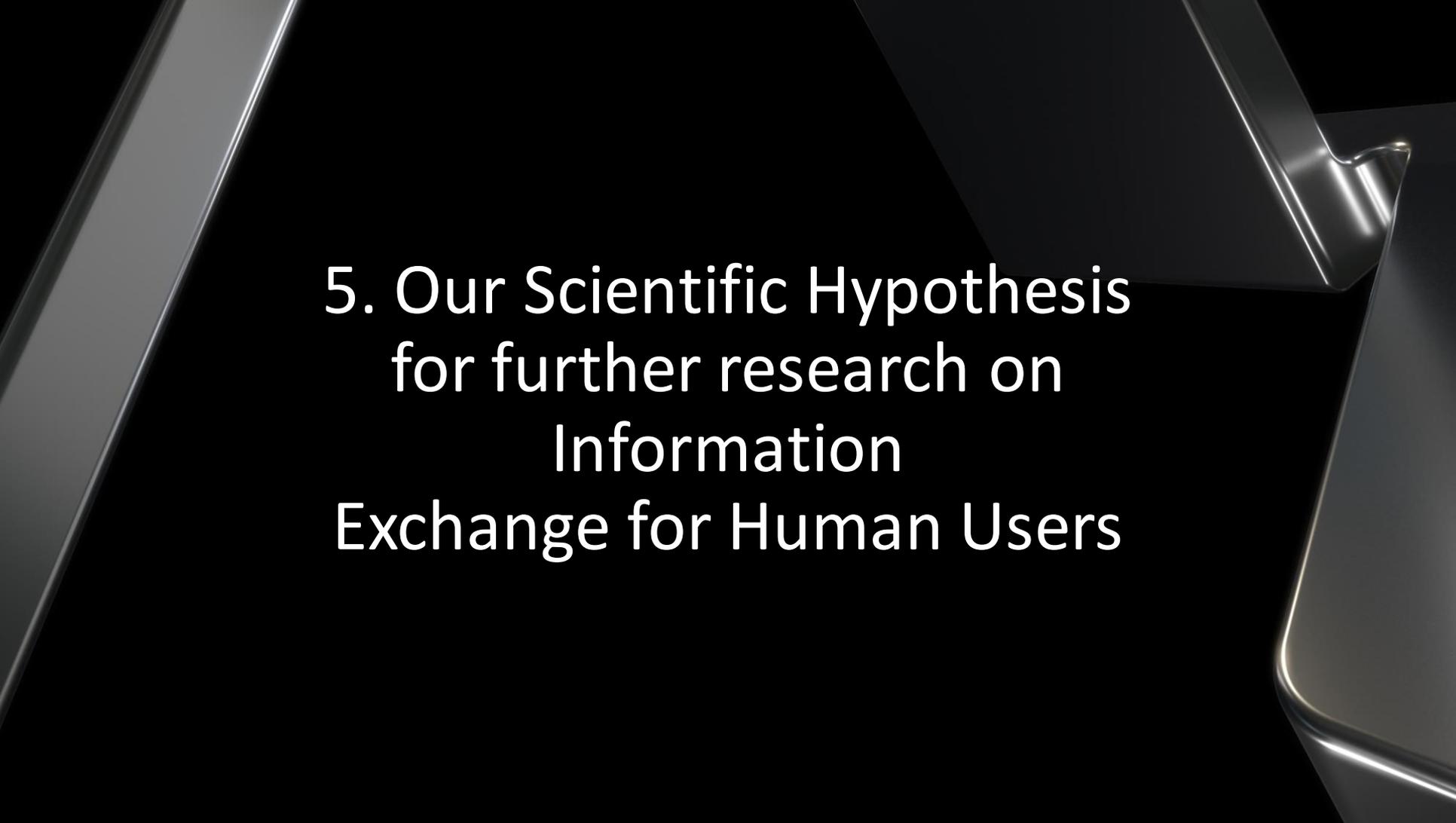
- Illustrating the main features of the prototyped App build from FORGE & Microsoft POWER APP

4. Sharing and socialising our
mini “hack” App...
An emergence of an unmet
need...?

2020-2021: An emergence of a common unmet need at the horizontal collaboration level



*What if the space contextualisation was an essential ingredient of the **Information Glue**?*



5. Our Scientific Hypothesis
for further research on
Information
Exchange for Human Users

Why Space contextualisation matters?

How can it solve the hidden factory



Cognitive Science Research

Space contextualisation is associated to memory **performance of the human brain**.

Neuroimaging evidence suggests that superior memorisers engage brain regions related to spatial memory as a learning strategy to memorise and recall information (Maguire, 2002).

The ancient method of loci (MOL) or memory palace is attributed to the Greek poet Simonides in 477 and used by memory champions (and Sherlock Holmes).

Research suggests that the spatial mnemonic technique can be applied to manage today's information overload and has been positively tested in education studies using simple **spatial anchors to memorise items** (Putnam, 2015)

Tech Development success

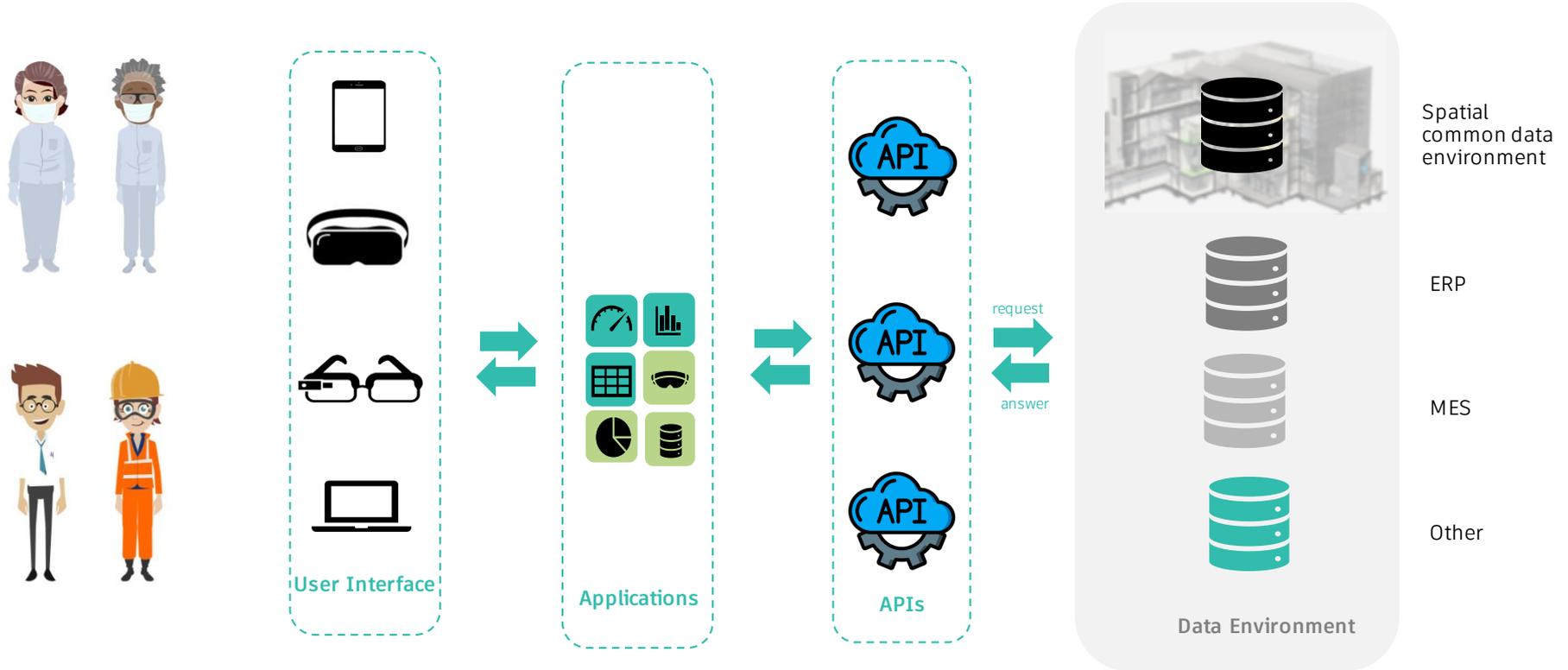
In 15 years the **Google Maps API** has become an essential and unified platform of great value substrate for many services such as ridesharing and business information overlay. (Arup, Digital Twin Report, 2019)

Google's co-founders Sergey Brin and Larry Page, thought that geospatial – **data and information related to maps** and location services - was a key **element of Google's organising the world's information**.

The future of the digital map, however, is not actually of the map, but using the map. Eg: Niantic Labs [Field Trip](#), or, [Ingress](#). These are the next evolution of the map, **humanising and contextualising** location to make it more relevant to the human users and **indoor usage is the next frontier**. (Gibbs, 2015, The Guardian)

6. Conclusions

TECHNICAL CONCLUSION: THE NEED OF COMMON DATA ENVIRONMENT



BUSINESS LEARNING AND CONCLUSIONS

0£

SPEND

HACKING MENTALITY

- Hacking is not doing expensive POCs to fill pilot purgatory or graveyards
- Hacking is to confirm User desirability, Business viability and Technology feasibility

100%

BUSINESS
FOCUS

HUMBLE STAMINA

- Humble in the approach: go slow to go fast
- Adapt the speed to your users' readiness
- Adapt the speed to your company business readiness

80%

LANGUAGE
REWORK

CLARITY IS THE ESSENCE

- Adapt agile language
- Adapt design thinking language
- Adapt Ux language
- Neither engineering nor manufacturing are accustomed to these approaches

20%

PICK THE RIGHT
OPPORTUNITIES

FIND THE MAGIC 20%

- Which will help to build 80% of the core foundations

The background of the slide is black with several large, dark grey, 3D-rendered geometric shapes that resemble architectural or industrial components. These shapes are positioned in the corners and along the sides, creating a sense of depth and modernity. The central text is white and stands out prominently against the dark background.

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