



# impact

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Digital for Intelligent Operation Control Center

VIVA TECHNOLOGY  
14-17 JUNE

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# RATP CONTEXT



# RATP's challenges in modernizing OCC

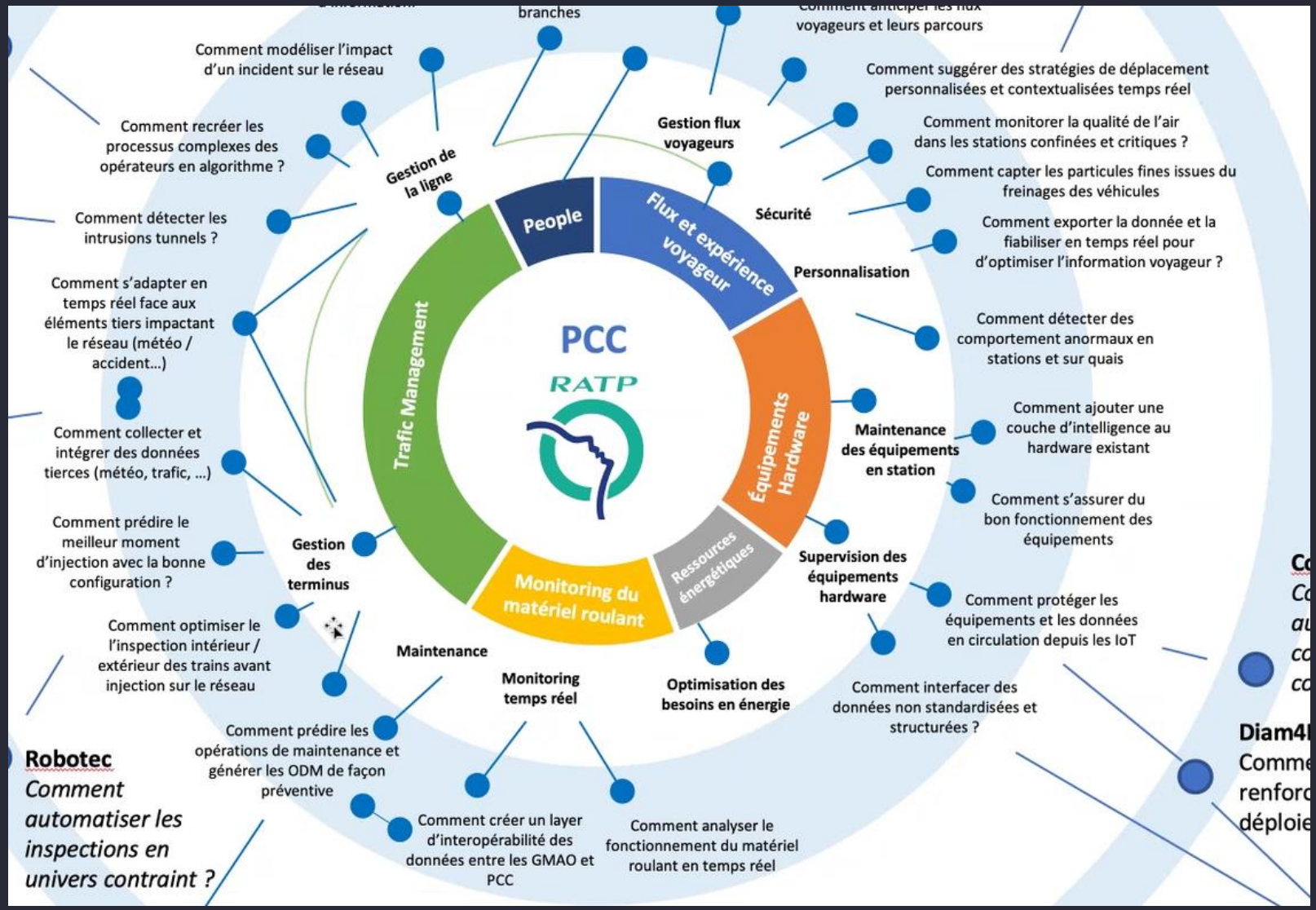
## Context

- Modernization began in 2004: 7 GOA2 lines already modernized,
- Objectives :
  - Renewal of obsolete installations: switch to **digital vs. analogue solutions**,
  - In-depth rethinking of the functional system to offer **advanced regulation tools** (adaptation to the transport offer established with IDFM).
- Features of the solutions deployed :
  - **Technical perimeter focused on the traffic control function**,
  - Handling the interface with CBTC products deployed on these lines => genericity,
  - Innovative, unchanging functional offering,
  - Plant operation in line with operator expectations

## But new requirements to take into account

- Flexibility expected in terms of scalability / establishment of a OCC RATP product strategy to guarantee investment performance:
  - **Design a new generation of OCC's that can be qualified on all metro lines (excluding GOA4)**,
    - Enhanced system parameterization and configuration options,
    - Accelerate the modernization of the Paris network:
      - Arrival of new rolling stock and deployment of driver assistance solutions,
      - Plant regeneration (GI business line),
    - **Guaranteed scalability to respond favorably and over time to the demands of the PTA in Ile de France.**
- An opportunity: take advantage of digital technologies to open up the field of possibilities:
  - **develop the integration of Occ solutions with other systems (maintenance, space supervision, passenger flow management, energy management, etc.).**







# CONTEXT AND CHALLENGES



# Operations Control Centre - A hub for monitoring, controlling, and responding to diverse activities and incidents in the Railway Management System (24/7)

## Operations Control Centre (OCC) – Features and Functions

*The Operations Control Centre (OCC) is one of the most critical functionalities of the Railway Management Ecosystem*

- **OCC often termed as the heart of the Railway Management System helps in managing the transport operators' day-to-day activities**
- **Major functions consist of monitoring, and coordinating various operational activities to ensure the highest quality of service**
- Activities include remote maintenance support as well as identifying and responding to unexpected situations/incidents which demand immediate attention, coordination, and action
- Timely solution is required to avoid unacceptable delays and recover smoothly from operational interruptions
- This helps in minimizing negative impacts on customer service, cost, and security among others
- Efficient and Effective Operations Control Centre relies on connectivity, digitalization, real-time communications, and collaboration with Other Stakeholders in the system

### Key Features of OCC

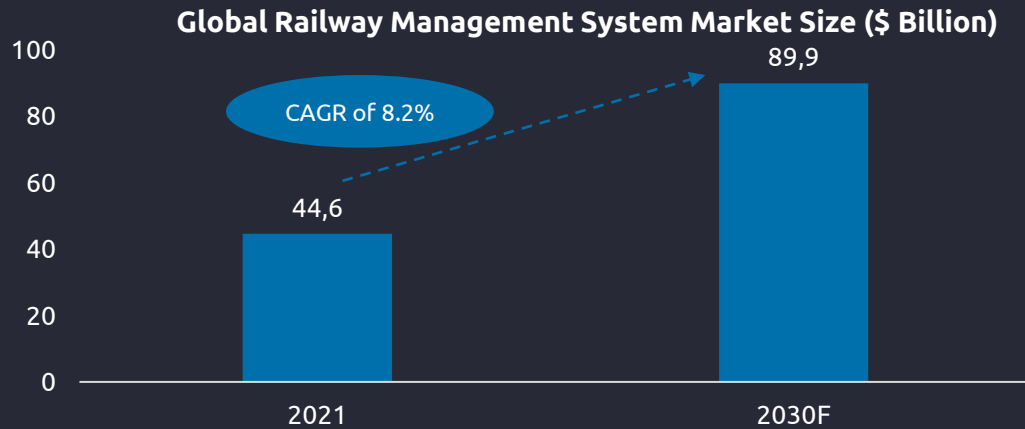
- Monitoring Operations
- Supervisory and Control
- Analytics and Prediction
- Traffic Sensing
- Commuter Sensing
- Crisis Management
- Planning and Optimisation of Assets
- Equipment Health and Maintenance Record

### Major Challenges faced by OCC

- Coordination and Collaboration
- Situational Awareness
- System Integration and Interoperability
- Agility and Reactivity
- Alarm Fatigue and Stress

# Overview of the Global Railway Management System Market

## Global Railway Management System – Market Size and Growth Trends



- **The Global Railway Management System Market is expected to clock a CAGR of reach ~8% between 2021 to 2030 and reach \$89.94 Billion by 2030**
- Growing population, huge government investment towards urbanization, and technological advancements are the major growth drivers of the market
- An efficient system aids in improving the overall operations and control, energy & asset management, staff & passenger safety among other benefits
- **European region accounted for the largest share in Revenue in the segment in 2020 and is expected to grow at a healthy rate going forward**
- Western European countries like UK, France and Germany, are investing heavily in modernizing and upgrading their rail systems
- **Asia Pacific, Middle East, and Latin America are the fastest-growing markets**

### Key Components of Railway Management System:

- Multifarious Systems work in their individual capacity, though connected directly / indirectly with each other wherein OCC works as the **'Heart of the System'**







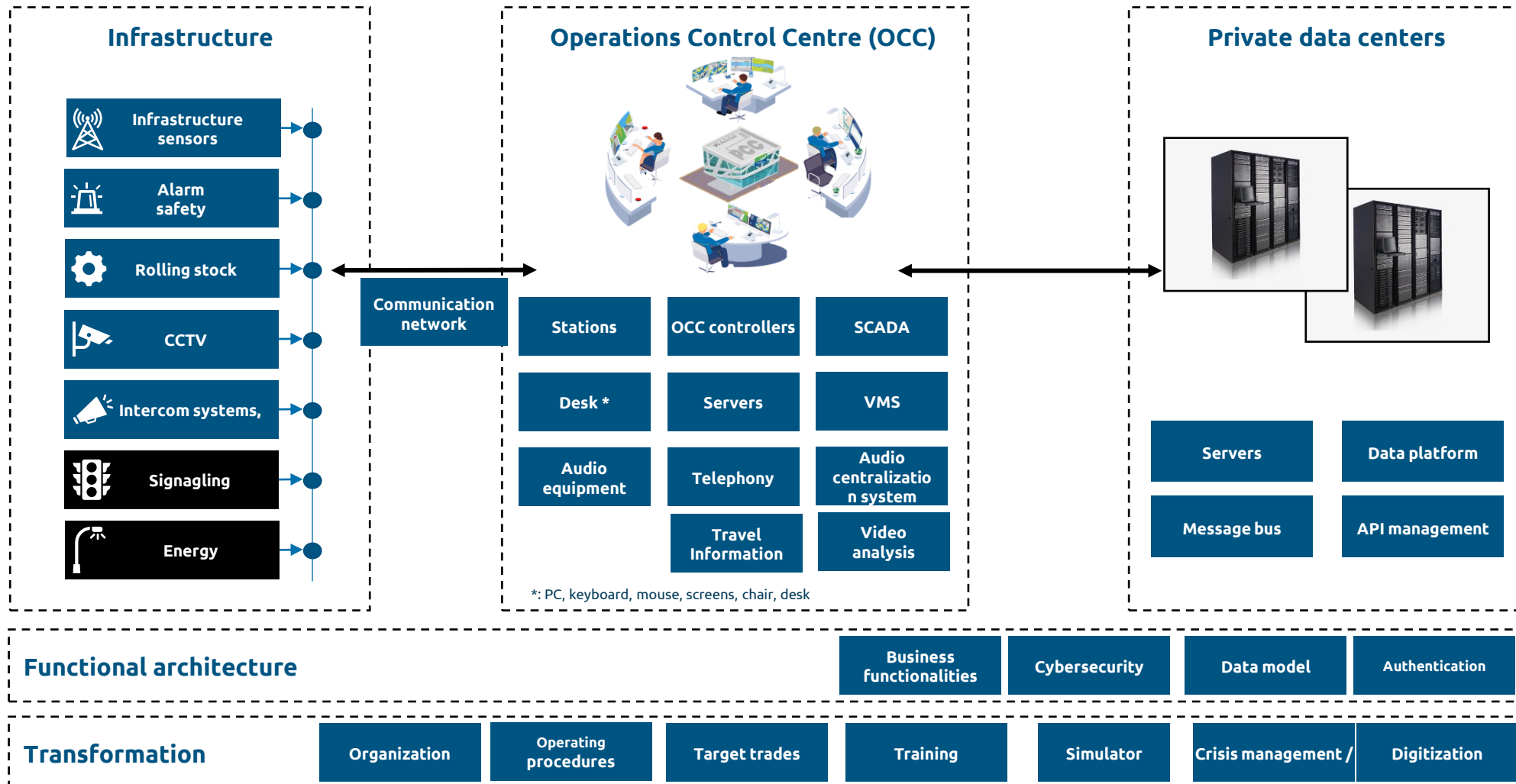
# SOLUTIONS



# ZOOM TECHNOLOGICAL CAPABILITIES

THE OCC IMPLEMENTATION SOLUTION IS A COMBINATION OF HARDWARE AND SOFTWARE COMPONENTS

These hardware and software components enable remote control and supervision and the provision of enterprise data services



# OCC ARCHITECTURE IS PART OF A FUNCTIONAL ORGANIZATION TO OPTIMIZE QUALITY

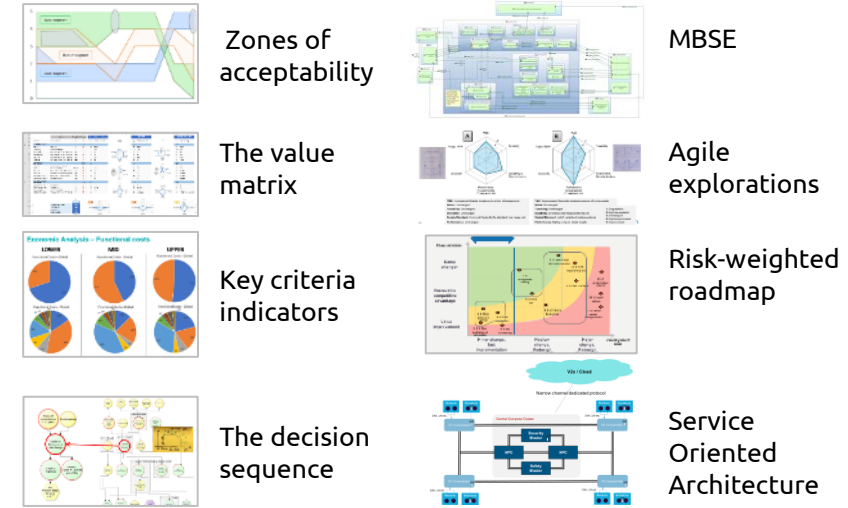


## The result of initial design choices

The architecture identifies the functional breakdown and the relationship between functions. It determines the scalability of the OCC and its functions, the adaptability of the service rendered to the complexity of the situation, and the resilience of the OCC to failures.

Architecture is the result of initial design choices. It provides the foundation for the functional structuring of the operation and can hardly be modified. It is therefore critical.

Our methods for designing the architecture of complex systems enable us to adapt functions to requirements (particularly in situations with complex resolutions), ensure system resilience to various incidents, control quality of service, anticipate critical situations, and enable functional scalability to integrate new technologies.



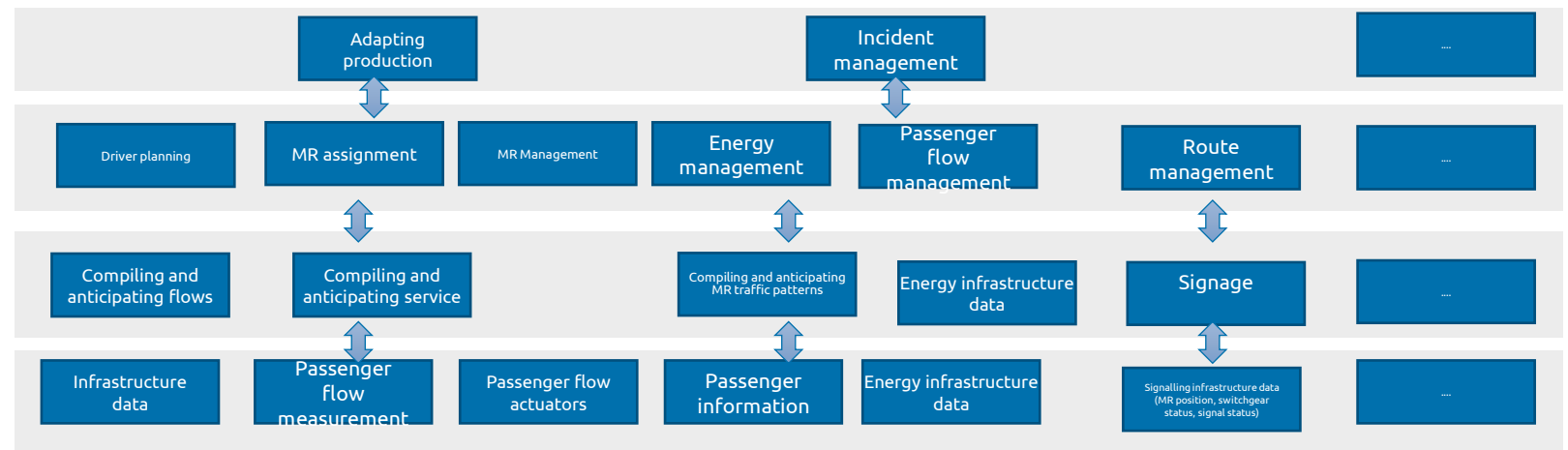
Example of system architecture tools

High-complexity superior functions

Complex management functions

The first level of intelligence

Sensors and actuators





# INNOVATION PERSPECTIVES





## KEYS SUCCESS FACTORS TO ENGAGE A PARTNERSHIP

1. Topics of interest convergence between our Research & Innovation strategy and the expertises of our researchers in place.
2. Contributions and expertises expected from each party should be complementary, rather than overlapping.
3. Common desire to build a strong medium- to long-term business relationship
4. Depending on confidentiality restrictions, the desire to communicate together on the results of our work.

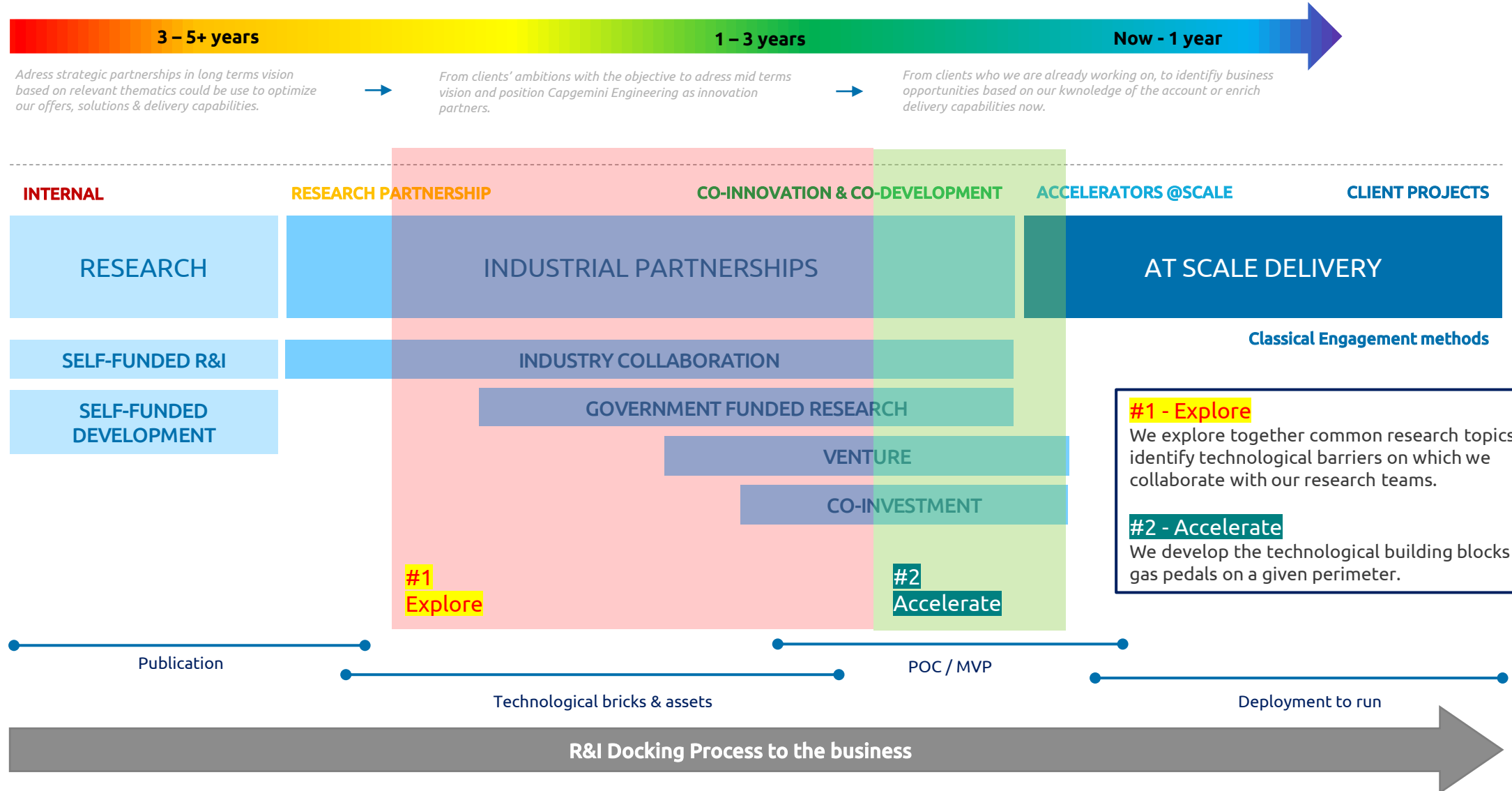






# ONE TEAM ONE MINDSET TO INVEST A MULTI HORIZON FUTURE

## Address technological challenges with our client from research to @scale delivery



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