



Catalyst project

# Edge Smart Spaces beyond 5G

C22.0.320

Phase II

# The commercial challenge

Communications Service Providers (CSPs) have invested heavily in connectivity over the past decades but have struggled to profit from this investment through higher margins delivered by added value services. The next few years will see investment levels ramp up further as the roll-out of both 5G and MEC (Multi-Access Edge Computing) accelerates.

This new technology landscape has the potential to transform customer experiences and open up new added value services. The challenge for CSPs is how to deliver and monetize these innovative new services, gaining strong ROI and improving their market positioning by evolving from Telcos to high capability Techcos.



Backed by uncompromising security, within the online environment and physically, in the Airport itself, these are the components that make the solution a potentially major step forward for CSPs and all other partners.

Phase II

# The Edge Smart concept

The Edge Smart Spaces Beyond 5G catalyst project demonstrates how CSPs can commercialize and deliver digital solutions that solve current problems of their corporate clients by complementing 5G and Passive Optical Networks (PON) connectivity with distributed Edge computing for the creation of a smart business B2B2X ecosystem at high speed, with low to no touch human intervention.

To test and prove the concept, the catalyst team selected an airport as the host location. This is an environment where the demand for services is always strong and there are opportunities to build an attractive yet highly secure digital commercial ecosystems, delivering outstanding customer experiences with a very fast set up building upon CSPs networking capabilities.

By packaging services and offers from a range of service and product developers, CSPs can establish a fully functional smart space at any airport in less time than it takes to set up a physical product display. This enables CSPs to deliver added value, resulting in higher margin services, while providing a compelling commercial proposition to retailers and service providers through a B2B2B2X approach.

## The technical challenges

The Smart Spaces concept is based on 5G network slicing and PON network to deliver cloudlike speed and ease of use in service delivery. Intelligence based in Edge devices enables advanced analytics and a very fast response to changing requirements. Delivery is highly automated to enable low touch deployment, keeping costs low and time to market high.

Challenges in four key areas have been identified and addressed:



Simple delivery, providing partners with a very logical, easy to understand process for getting their service into the Smart Space.



Efficient, low-touch partnering, enabling very fast onboarding, without compromise to security.



Providing an open and secure horizontal edge business platform for a multi-vendor environment for this and other market segments, that provides a consistent experience from edge to core to cloud in a hybrid and multi cloud approach.



Efficient monetization, which ensures that all partners are properly rewarded and that the infrastructure owners (physical: the Airport and virtual: the CSPs) are able to profit from their own investments.

# Building a partner ecosystem

The Edge Smart Spaces business scenario gathers partners within a clearly defined ownership hierarchy of ownership and responsibilities.

1

A neutral Host Operator, delivers the network connectivity and the edge computing infrastructure to the entire environment.

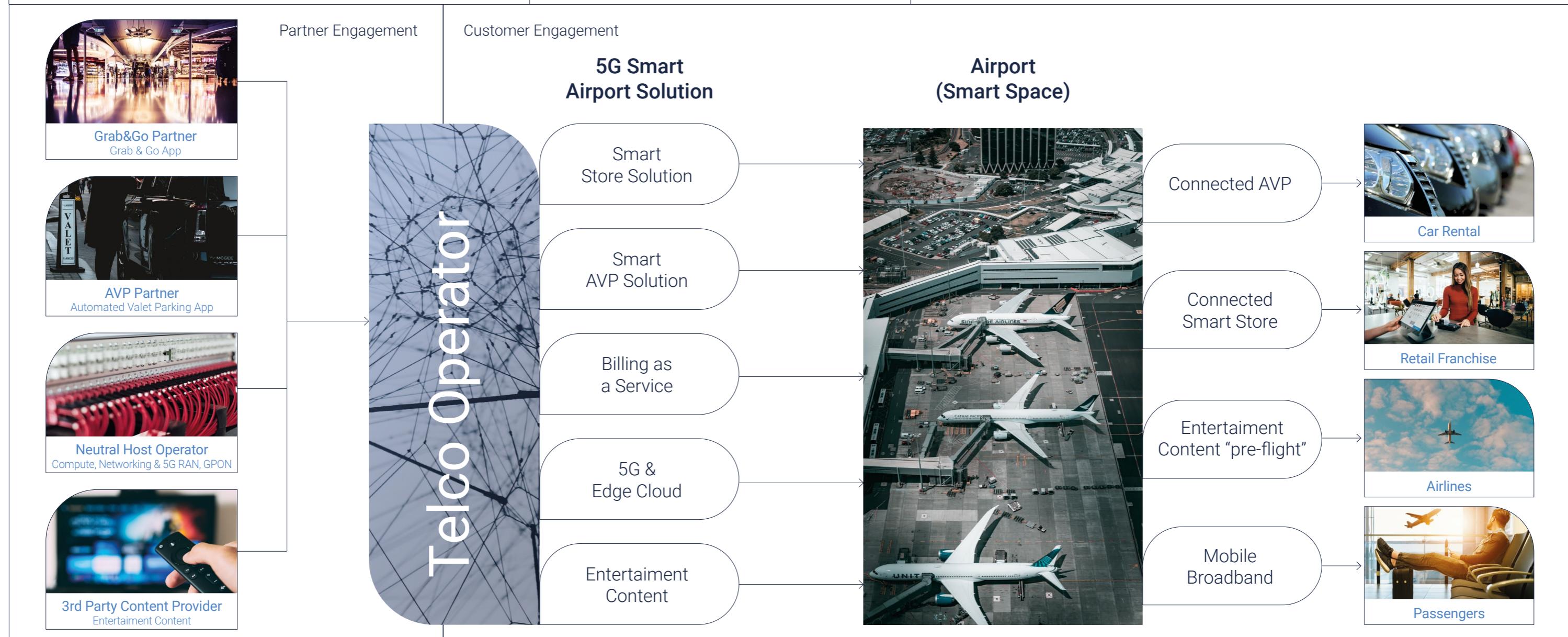
3rd Parties Providers deliver a wide range of applications (as a Grab&Go solution or an Automated Valet Parking service). These can be purchased by the customers of the airport as retail franchises, car rental companies, airlines, and the travellers.

2

The CSP, acts as the Business Ecosystem Owner, providing the collaborative environment for joint development and delivery of digital services.

3

The Airport provides the Smart Space, itself, and therefore owns the relationship with the customer, which means the retail franchise or other service partner.



# The catalyst partners team

Telefónica, American Tower Corporation and Verizon have championed this project setting up the challenges, supporting the definition of use cases and giving valuable insight about the digital solutions and network architectures that should be addressed and implemented in the project.

NTT Data, Matrixx, Pega Systems, Compax Digital and Red Hat joined their solutions, capabilities and experience to come up with a fully digital and cloud-native IT architecture that solves the project technical and commercial challenges:



Pega, a low-code platform for AI-powered decisioning and workflow automation, provides a low code approach to automate the process for onboarding partners, defining and building added value services and using real time data, plus advanced analytics for dynamic pricing and in-depth reporting. Additionally, Pega provides the customer orchestration process needed to decompose order offer components into the different partner customer-facing services, using TMForum Open APIs to integrate between solution components, making it possible to seamlessly deliver a wide range of targeted services to end users.

Compax Digital provides the platform on which the offers are configured, while managing three different instances in this project. These are partner to telco offers, telco to airport offers and airport to store. Compax Digital also provides the Configure-Price-Quote (CPQ) capabilities to price offers for customers and confirm customer acceptance.

NTT DATA

NTT Data provides through its Symphony OSS Automation a multidomain edge orchestration and a service catalogue and inventory to enable the zero-touch deployment of an Edge Application. NTT Data also provided its NTT Data Grab&Go solution as a Multi-Edge Computing Application based on IoT and Computer Vision that implements an unattended store.

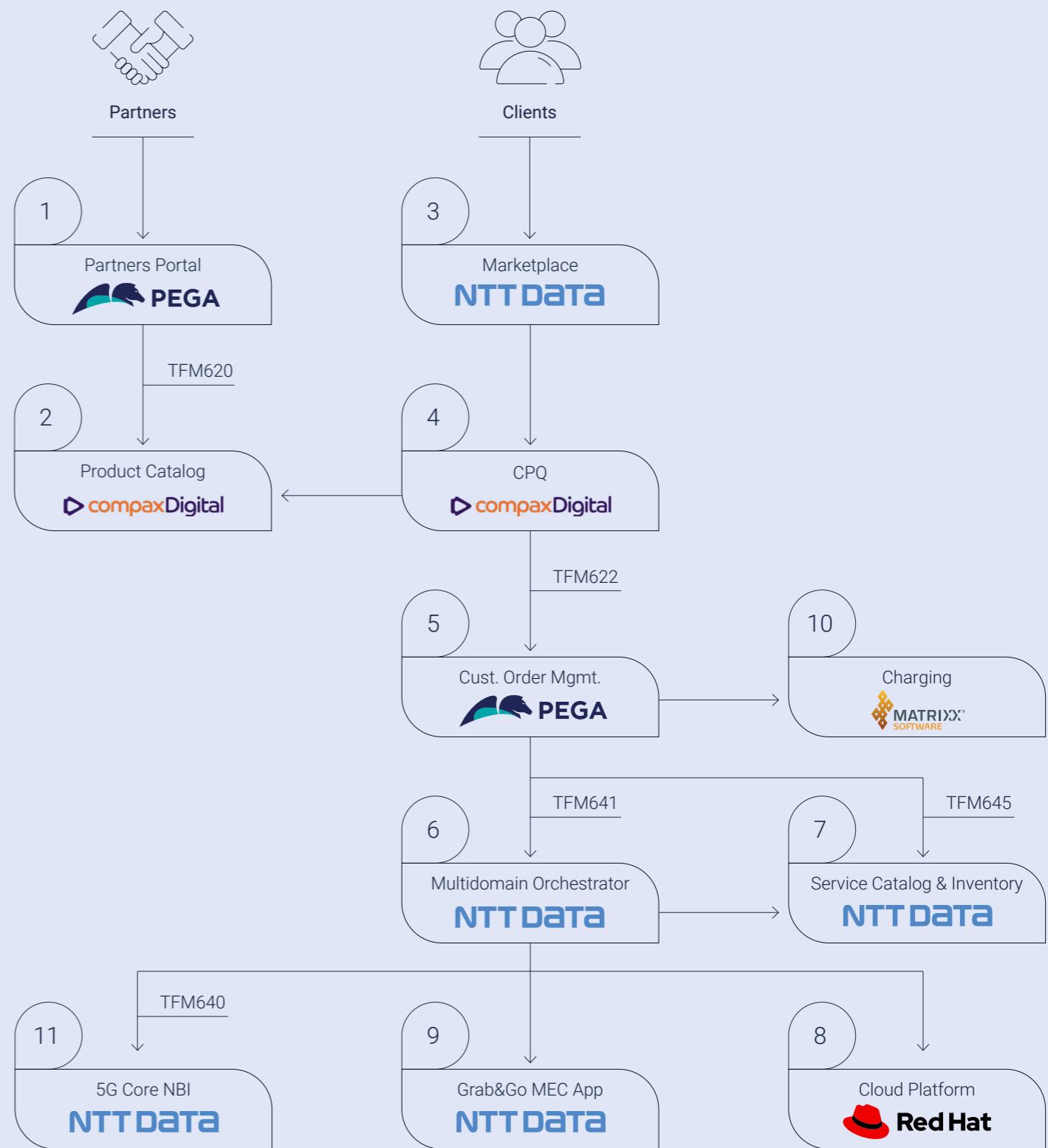
MATRIXX Software

MATRIXX Software provides the MATRIXX Digital Commerce Platform (DCP) to deliver flexible and secure multi-party monetization of all transactions within the Smart Space. This enables payment based on value delivered, with accurate charging to all partners contributing to the service, and complete, real-time transparency to ensure accurate and timely accounting.

Red Hat

Red Hat provides its Open Shift application container platform for deployment of network functions and applications from edge to cloud. This simplifies how application workloads are being delivered and deployed to where needed at high speed, permitting fast, automated and secure roll-out intrinsic to the Smart Spaces concept.

To ensure the highest levels of security in a sensitive location, the package also includes some physical infrastructure, including security cameras for a continuous video record, with streaming nodes to manage visual data flow and continuous analysis to enable fast intervention, should this be needed.



# NTT DATA GRAB-AND-GO





A “Smart Shop” use case was developed illustrating how a retail franchise can provide its customers with a differentiated, quick, efficient and automated shopping experience through the implementation of a Grab&Go solution.

## Implementing new concepts

In the case of this catalyst, a “Smart Shop” use case was developed illustrating how a retail franchise can provide its customers with a differentiated, quick, efficient and automated shopping experience through the implementation of a Grab&Go solution. For extending to new services and use cases, a four-stage process has been defined.

### Stage 1: Contractual.

The Smart Spaces approach uses frictionless partners onboarding, setting up a “Seller Journey” that uses automation and self-service for each new partner.

They can define their use case, reach an agreement with the Business Ecosystem owner (the CSP) and start to deliver their service with a shorter time-to-market than traditional approaches.

### Stage 2: Product and Service.

As new products and services are proposed, onboarded, and delivered, the Smart Space partners will want to ensure that their 5G and PON-enabled environment quickly leads to added value for their customers and the desired return on their investment. This is achieved with low or no touch onboarding to manage a growing portfolio of services effectively in order to maximize value. This will involve bundling offer components to improve delivery efficiency, while managing all service offers, together with whoever delivers them, as a single portfolio.

### Stage 3: Service Delivery and Orchestration.

This is where the ability to orchestrate multiple service components across the entire platform becomes important.

The orchestration platform enables automation across the Smart Space enriched by advanced analytics, to permit fast, one-click deployment and purchase, with a full audit trail.

### Stage 4: Monetization.

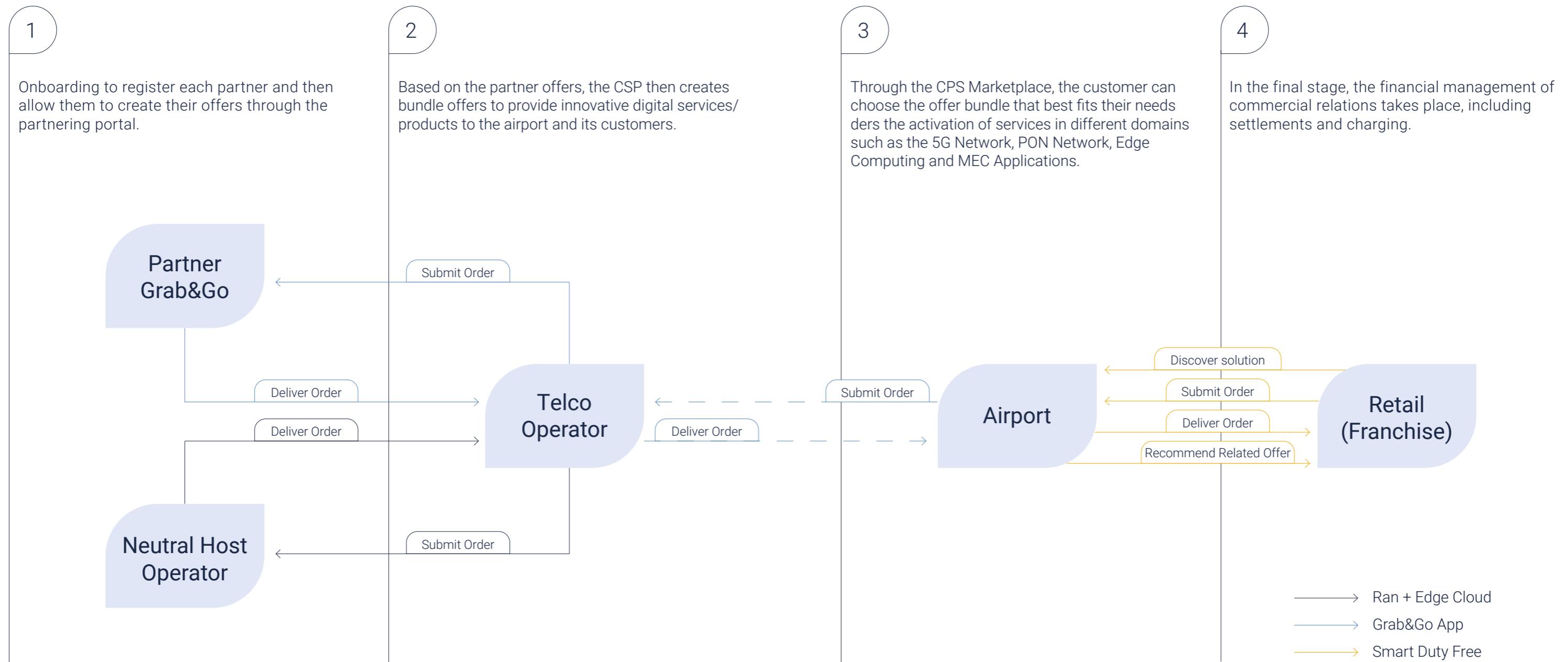
Finally, the collaborative environment includes tracking, accounting and transaction management components that enable every partner to share revenues, commissions and costs according to the agreement that governs each service.

An individual transaction can therefore be defined in different ways: as a cost to the end user who purchases the service; as commission to the Airport that owns the space; and as revenue to each provider that contributes to the service.

# Delivering and monetizing

## Ecosystem Model

Solutions Delivery / Orchestration Relationship



Other external partners can offer additional solutions to entities within an Airport Smart Space, such as retailers, entertainment companies, car rental and valet parking, or companies offering services that range from independent lounges to restaurants.

Their offer includes not only the connectivity requirements - bandwidth for video streaming, access to core business systems for supply chain and inventory management, customer profiling and security - but includes the platform capabilities for automated deployment and monetization.

Through the platform, offers can be adjusted and tuned at any time, with high levels of automation, incorporating analytics and results from marketing and sales campaigns. In this way, the ecosystem develops its own momentum as a dynamic, constantly evolving shared environment. All vendors are able to profit from access to Airport Smart Spaces, while the CSPs involved raise margins through delivering added value services and not just commodity connectivity.

# Potential development

The Edge Smart Spaces beyond 5G catalyst project is designed to prove that a 5G-enabled cloud solutions that solve real problems of vertical industries has the potential to give CSPs new revenue streams by enabling added value services from multiple providers. By building a collaborative ecosystem of partners, it is possible to create vibrant, dynamic, and highly profitable spaces for retail franchises and a growing range of other service providers within the Smart Space as well.

CSPs can position themselves strategically in this ecosystem to ensure that new technology investments lead to better margins, in the future. The Smart Spaces demonstrated in this phase of the catalyst project for Airports can be applied equally to many other environments, both permanent and temporary. Smart Spaces will transform the ways in which new services come to market, fuelling innovation, and growing profits.

## How does TM Forum helped to make this project successful?

Thanks to the collaboration ecosystem established by TM Forum, the catalyst brings best practices and standards from collaboration programs to life in real-world scenarios to prove the value of the solutions developed. The catalyst team has made extensive use of the TM Forum Assets, being some of them Guidebook GB1027(B), Etoml3 Process, G1022 ODA

Functional Architecture GuideBook, and multiple TMF Open APIs such as 620, 622, 641, 645, 633, 639 and 640. Finally, we have leveraged CurateFX, the tool helping stakeholders to manage digital ecosystem projects, accelerate time to market and create new business opportunities.

## Partners



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