5G ESSENCE: Use Cases, Methodology and Market Analysis

Eirini Vasilaki
Hellenic Telecommunications Organization S.A. (OTE)

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5G ESSENCE

Introduction

5G ESSENCE addresses the paradigms of Edge Cloud computing and Small Cell as-a-Service (SCaaS) by fuelling the drivers and removing the barriers in the Small Cell (SC) market, forecasted to grow at an impressive pace up to 2020 and beyond, and to play a "key role" in the 5G ecosystem.

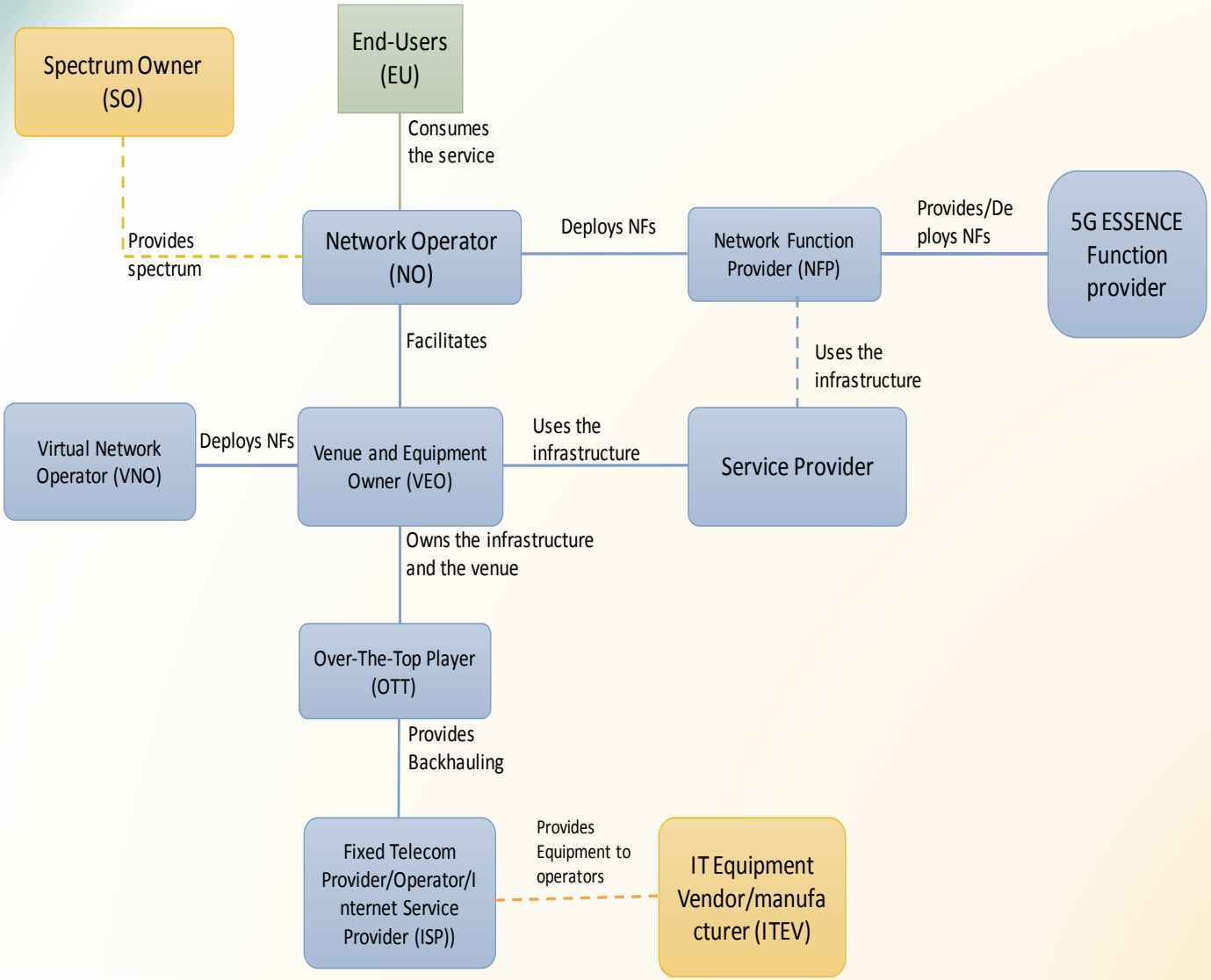
5G ESSENCE provides a highly flexible and scalable platform, able to support:

- **new business models and revenue streams,** by creating a "neutral" host market
- **reduction of operational costs,** by providing new opportunities for ownership, deployment, operation and amortisation.

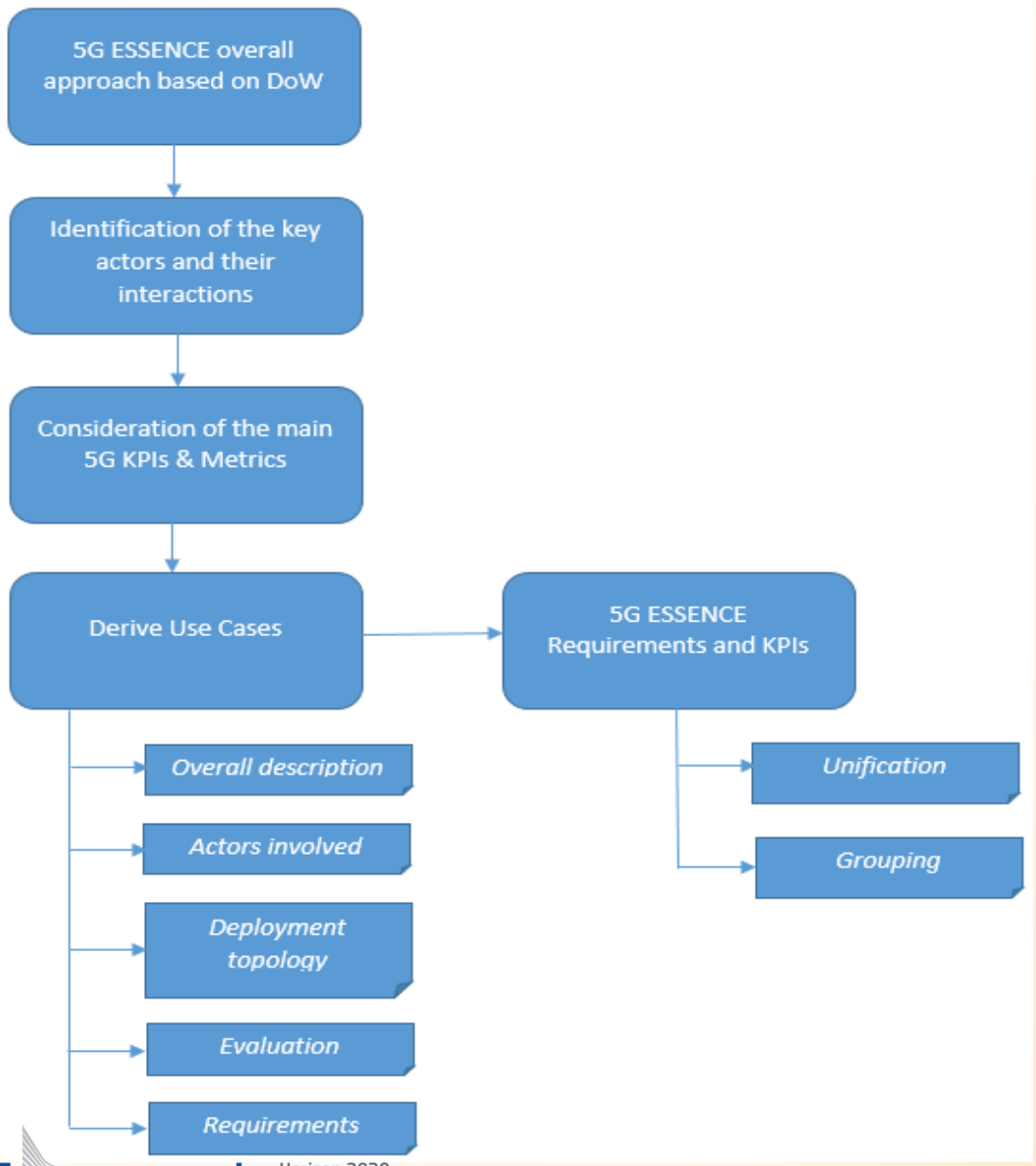
Actors and Interactions (1)

- **Venue and Equipment Owner (VEO):** It is a mall/ stadium/enterprise/municipality/large building owner, etc.
- **IT Equipment Vendor/manufacturer (ITEV):** These are companies/legal entities that develop and/or sell IT equipment, e.g., small cells.
- **Network Operator (NO):** These are companies/legal entities that possess the equipment so as to provide wireless communications services as well as to provide wireless access to end-users in wide areas, locally.
- **Virtual Network Operator (VNO):** These are companies/legal entities that do not possess the necessary equipment but lease it from another company/legal entity, so as to provide wireless communications services and deliver services to end-users.
- **Fixed Telecom Provider/Operator/Internet Service Provider (ISP):** It is a provider of backhaul connection for the Small Cells.
- **Service Provider (SP):** An entity that provides telecom and other services to the end-user (corporate, residential or other).
- **Over-The-Top Player (OTT):** Third parties that produce, control and distribute services over the NO (Network Operator) / VNO (Virtual Network Operator).
- **Network Function Provider (NFP):** An entity who supplies virtual network appliances, gateways, proxies, firewalls, transcoders, etc., thus eliminating the need for the customer to acquire, install and maintain any kind of specialized hardware.
- **End-Users (EU):** A person/SME enjoying services through the 5G ESSENCE network model.
- **Spectrum Owner (SO):** A company/legal entity that owns -or leases- spectrum for commercial exploitation purposes.

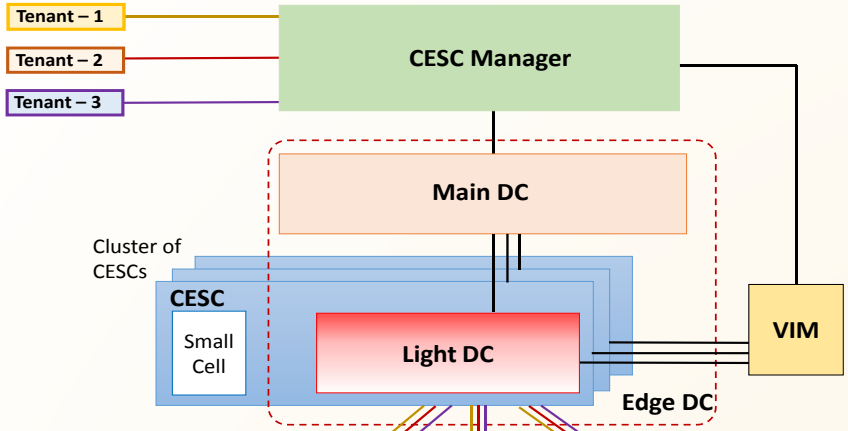
Actors and Interactions (2)

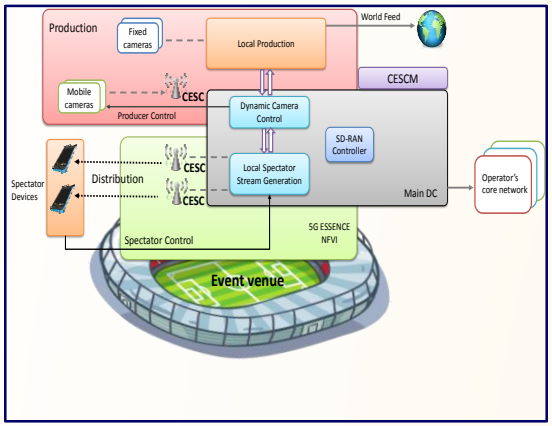


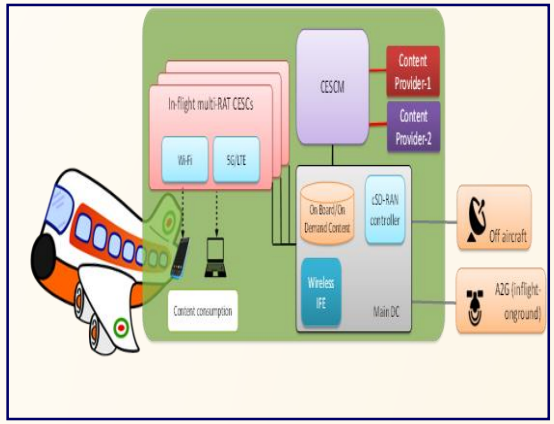
Approach for Use Cases Analysis

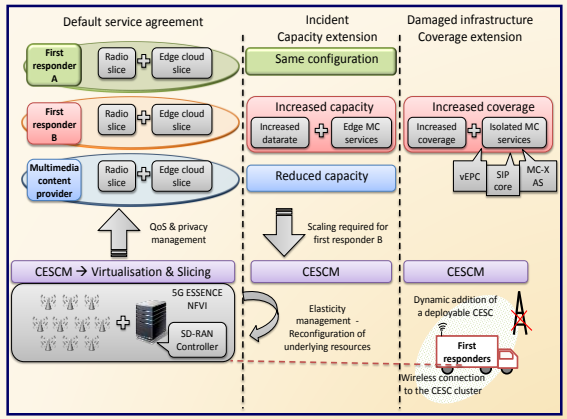


5G ESSENCE Main Scenarios



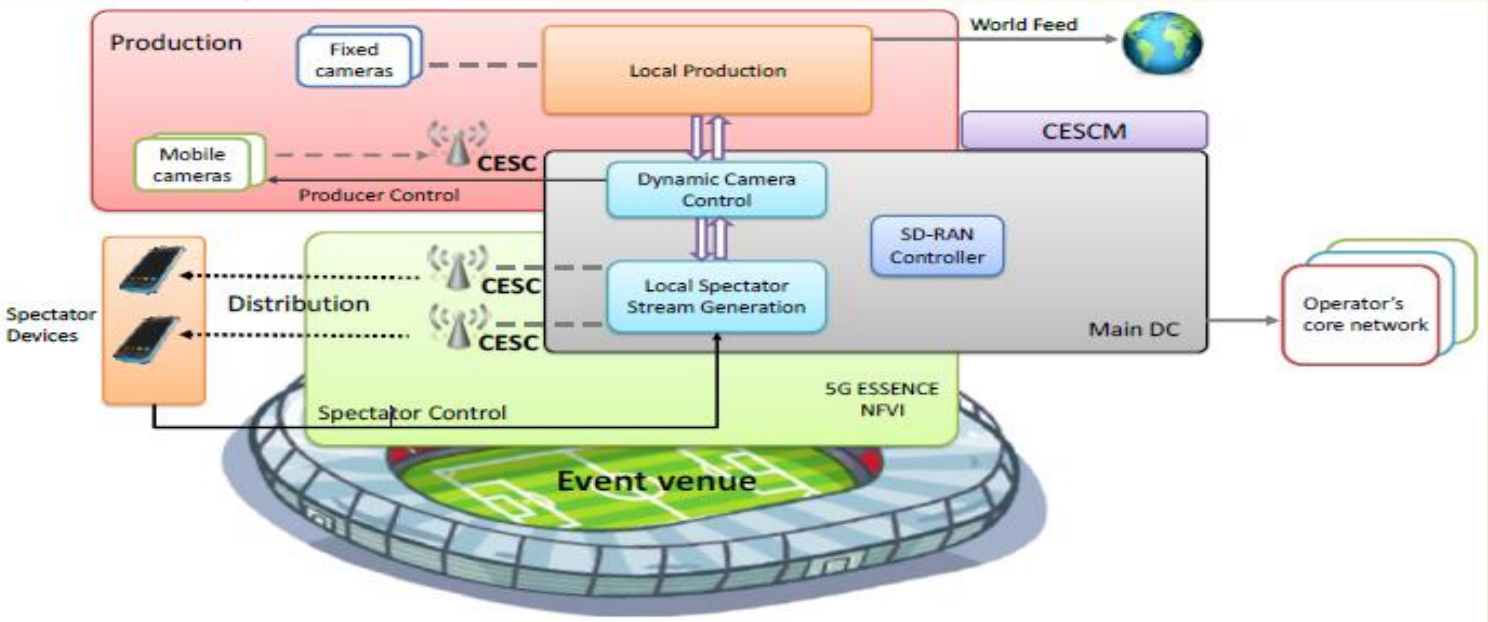






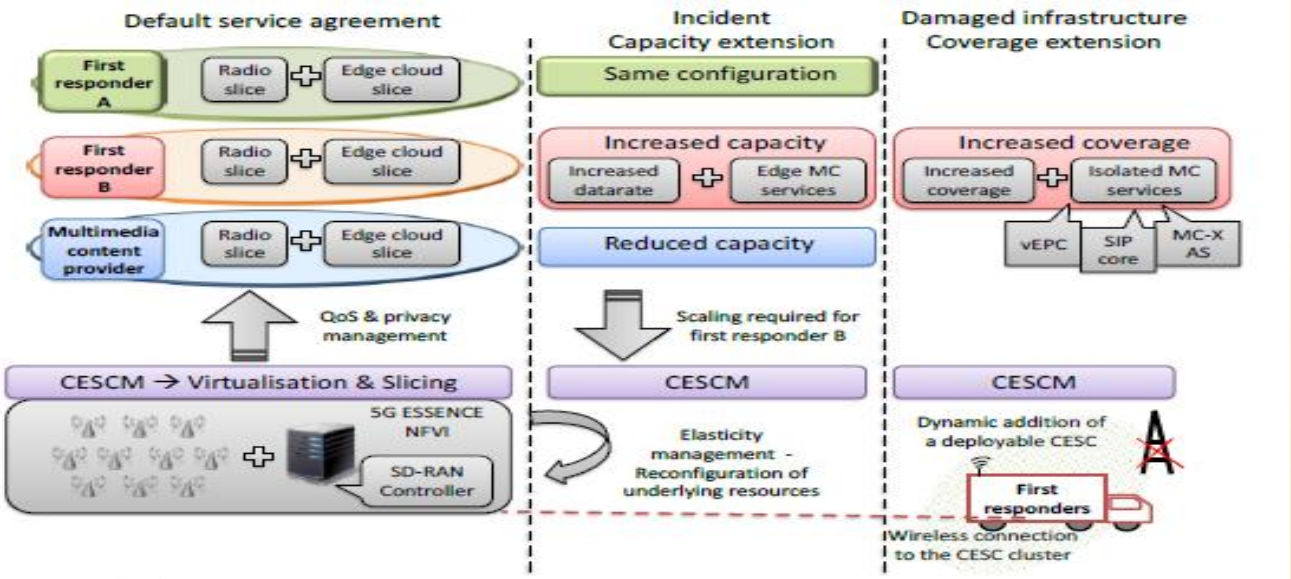
Use Case 1:
5G Edge Network Acceleration for a Stadium

- **Demonstration of a combined 5G-*based* video production and video distribution for delivering benefits to media producers and mobile operators,** *who will be able to offer enriched event experience to their subscribers.*
- This, coupled with value-added services and rich user context, **will enable secure, high-quality and resilient transmission, in real-time and with minimal latency**.
  - *Reception of live content from cameras located in the playing field, replays, and additional contextual information on mobile devices*



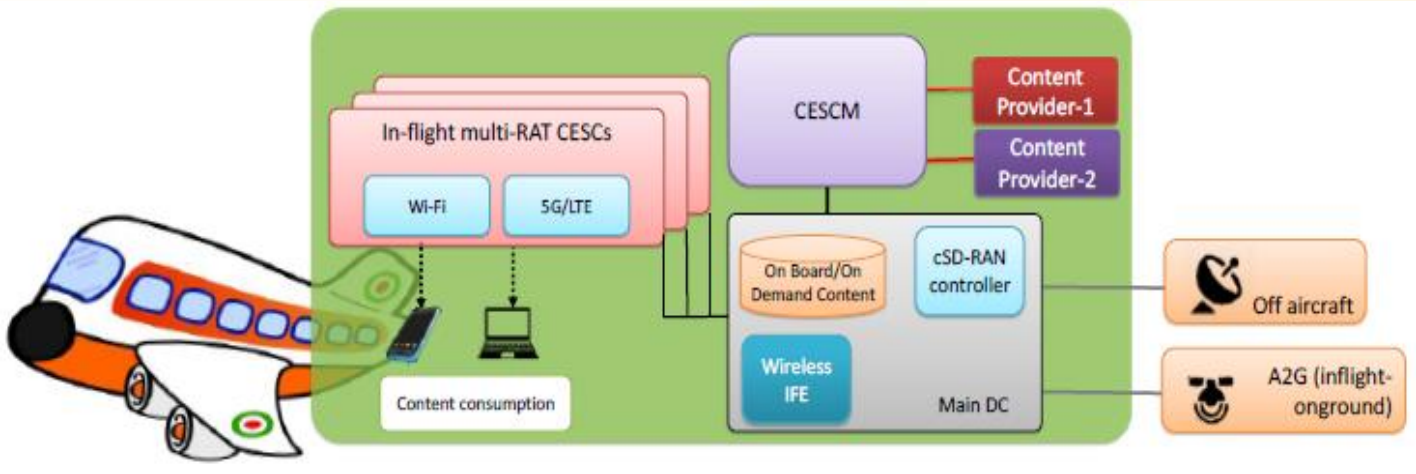
Use Case 2:
Mission Critical Applications for Public Safety

- **Involvement of one *-or more-* PS communications providers, to use the resources offered by a dedicated platform for the delivery of communication services to PS organisations in a country/region.**
  - *The 5G ESSENCE platform owned by either an M(V)NO or by a venue owner.*
- ✓ The infrastructure owner will exploit system capabilities to provide the required network/cloud slicing capabilities with dedicated SLAs to different types of tenants, *by prioritising the PS communications providers*.

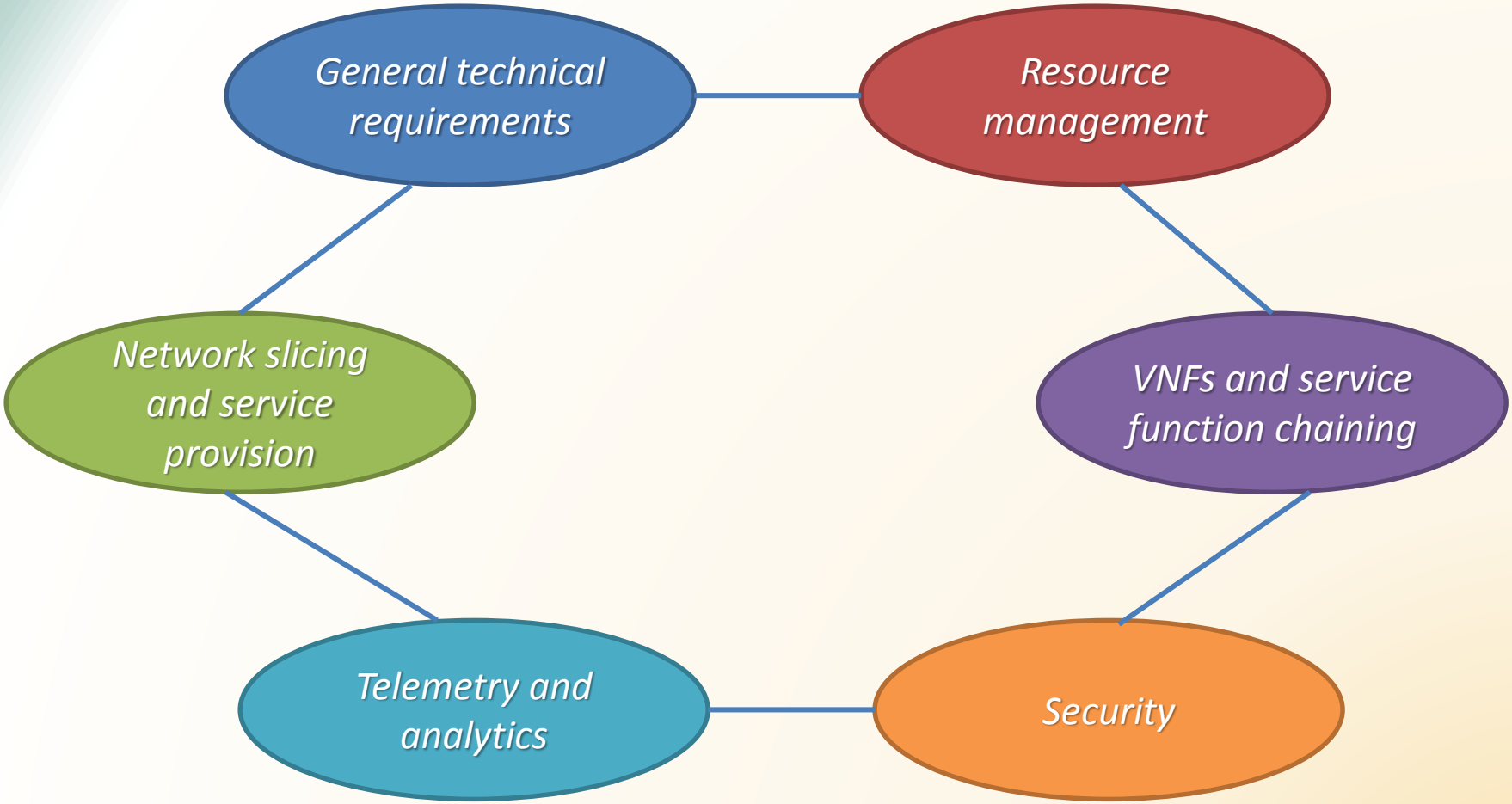


Use Case 3:
Next Generation In-Flight Entertainment & Communication (IFEC) Services

- **Testing and validation of the multi-tenancy enabled network solution for passenger connectivity and wireless broadband experience.**
- ✓ *Multi-RAT CESCs will be implemented as a set of integrated access points to be deployed on-board.*
- ✓ *CESCs will stream on demand multi-screen video content to the wireless devices, and rely on broadcast links to optimise the bandwidth usage.*



5G ESSENCE Requirements' Clustering



5G ESSENCE Business Model

- **5G ESSENCE technical inputs,** i.e.: performance, feasibility, etc. (measured in the technical domain).
- **Analysis of the following parameters:**
  - Value proposition
  - Market / customers
  - Cost and profit
  - Value chain / network
  - Competitive strategy
- **Provides Economic Outputs** (e.g.: value, price, profit)
  - measured in the economic domain

Business Model: Preliminary market analysis

Threat of new entrants

- Capital requirements
- Subscriber acquisition
- Switching cost
- Contracts with MNOs
- Access to content
- Access to distribution
- Regulatory decisions

Bargaining Power of buyers

- Mature market
- Standard product
- Undifferentiated product
- Brand
- Volume

Threat of substitutes

- Content in other media

Business Model: Preliminary market analysis (2)

Bargaining Power of suppliers

- Amount of VNOs
- Contracts with several VNOs
- Contracts with SPs
- Small virtual operators have less power

Rivalry among competitors

- Lack of service differentiation
- Brands
- Low switching costs
- Slow industry growth (mature market)
- Foreign alliances
- Low exit barriers

Business Model: Identification of deployment objectives

- **Value maximization**: Several key factors including revenue growth, cost management, customer satisfaction, and maintaining technological and operational capabilities will be considered.
- **Growing the user base:** Revenue growth can be directly tied to expansion of a VNO user basis, by expanding infrastructure or by upgrading capabilities that allow for higher service charges.
- **CAPEX Minimization:** Expanding or upgrading infrastructure is a capital expense *(i.e., an investment that depreciates over time)* for VNOs. Many factors must be considered *(i.e.: proximity/type of current infrastructure, geographical feasibility, market economics and competition).*
- **OPEX Minimization:** Operational expenses refer to costs associated with operating and maintaining an infrastructure. A variety of factors contribute to OPEX, including environmental factors *(e.g., power, cooling, etc.),* miscellaneous factors (e.g., taxes, repairs, etc.) and personnel costs.
- **Risk Minimization:** Any infrastructure or service expansion implies CAPEX and OPEX commitment. Any analysis of the opportunities for increased revenue through new user services adoption must be complemented by an analysis of the risks associated with deployment and operating costs.

Business Model for new mobile services

- ***New mobile services are typically expected to evolve according to well known patterns:***

Maslow's hierarchy of needs

1. Physiological needs *(e.g., sleeping)*
2. Safety needs *(e.g., health)*
3. Love/Belonging needs
4. Esteem
5. Self-actualization

"Maslow's hierarchy of needs" for mobile services:

1. Coverage
2. Capacity
3. Quality
4. Features

This guideline characterizes the evolution of mobile services

Conclusion

5G ESSENCE will offer fast and cost-effective access to a wide variety of new services and applications to European citizens, **through a flexible solution** that directly supports the specific users and user communities.

The **main benefits of 5G ESSENCE** include the **maximization of resource usage**, **the reduction of equipment and management costs**, and **QoS improvement**, *thus encouraging network innovation and the deployment of distinct network services.*

Thank you for your attention!

http://www.5g-essence-h2020.eu

For more information:

Dr. Ioannis P. Chochliouros

Head of Fixed Network R&D Programs Section
Research and Development Dept., Fixed & Mobile
Core Network DevOps & Technology Strategy Division, Fixed & Mobile
Coordinator of the 5G ESSENCE Project
E-Mail: ichochliouros@oteresearch.gr; ic152369@ote.gr;

Mrs. Eirini Vasilaki

Research and Development Dept., Fixed & Mobile
Core Network DevOps & Technology Strategy Division, Fixed & Mobile
E-Mail: evasilaki@oteresearch.gr;