# New trends in airport management

**Prof. dr. Sorin Eugen ZAHARIA**

**Director of UNESCO Chair "Engineering for Society" University POLITEHNICA of Bucharest**

# Content

1. Airport management challenges

2. Airport 4.0

3. The axes of work for digitalisation in the airport sector

4. Aviation's Environmental Impact Management

5. Management of Human Resources

# 1. Airport management challenges

- As **passenger volumes increase faster than new airports or terminals can be built**, demand is placed on airport management **for more complex and timely decision.**
- Cost must be controlled, **productivity must be improved and security enhanced.**
- And all of this must be done at the same time as meeting the **increased expectations of passengers** for smooth and efficient services which ensure hassle-free travel.

# Center on Interactions Among Passengers, Baggage, and Customer Groups



## Ground Handling

Cleaning, catering, cargo handling, aircraft maintenance, and fueling

Touch-down

Taxiing

Dispatch and Command

The designated stand

Cabin door opens

Collaborative Decision Making

Cabin door closes

Pushback

Take-off

Taxiing

**Airfield**

## Departure

Arrival, check-in, baggage drop, security check, waiting, and boarding

## Arrival

Deplane, customs clearance, baggage claim, transfer, and hotel

**Terminal area**

Travel plan

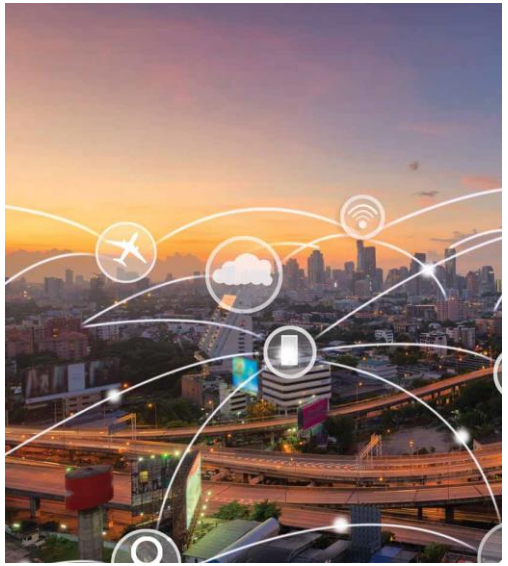
VIP services

**Public area**

# 2. Airport 4.0

## - digital airport -

- **A performant airport**
  - An airport focused to the customer
  - An airport innovant
- **An agile airport**
  - An airport connected by network(ACDM)
  - An airport flexible
- **A responsible airport**
  - A clean airport (using green energy)
  - An airport centered on human

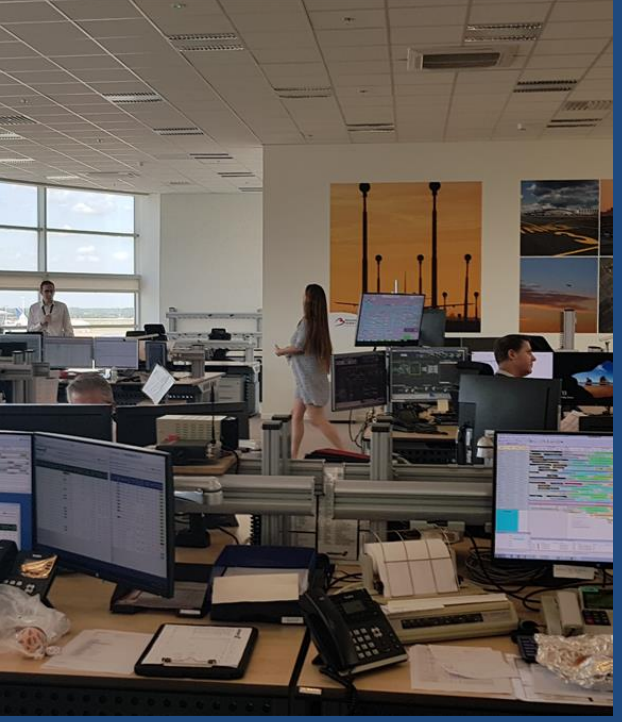


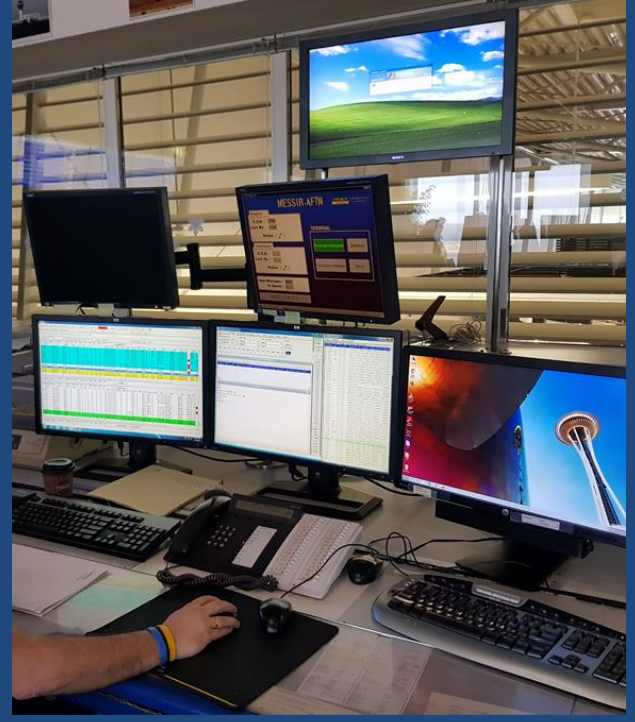
# Airport 4.0

- Digitalization
- Environment
- Intermodal transport
- Human resources

# The basic steps of digital transformations

- Airport environment assesment
  - A multidimensional review of airport's characteristics
- Airport plan and objectives
  - Agreement on the priorities and actions of specific digital plans
- Internal organisational review and requirements
  - An assessment of current organization and competencies versus what is needed to remain flexible and agile through the digital transformations.





# 3. The axes of work for digitalization in the airport sector

## 3.1 Increasing connectivity

Smart airport services (ACDM 2)

Connected airport (ACDM)

Connect humans

Lead airport ( APOC)

## 3.2 Development of software that communicates

Huawei

iAirport Operations

NIIT technologies

## 3.3 The virtual for supporting decisions

Development of appropriate models

Simulate the functionality of airport

Lead the airport

# The axes of work in the airport sector

## 3.4. **Changing of the workstation**

Reduce hardship

Human-machine interaction

Accompany the staff

A new organization of work

New skills required

## 3.5. **Security of data and processes**

# Airport missions:
# Ensure Safety First, Optimize Services, and Achieve Normal Flight Operations


Shorten incident response time and improve collaborative emergency response capabilities

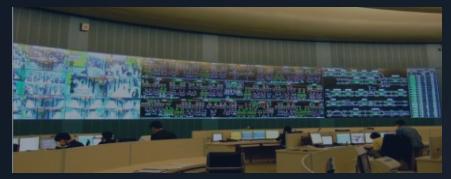

Cut aircraft turnaround time


Minimize passengers' time at customs and security checks to increase shopping/meal time

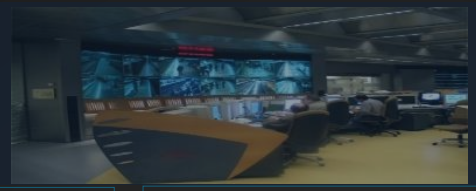
**Big Data** **AI** **Video** **IoT** **Cloud Computing** **Mobility**

## Continuous innovation in technology

# Huawei Smart Airport Solution: Situational Awareness, Cloud-and-Network Synergy, Application Enablement, and Visualized Businesses



APOC



**Comprehensive operations control**

- Flight info integration
- Apron vehicle mgmt.
- DCS
- Ground handling system

**Comprehensive security**

- Facial recognition/tracking
- Perimeter protection
- Runway FOD detection
- Airport environment monitoring

**Comprehensive services**

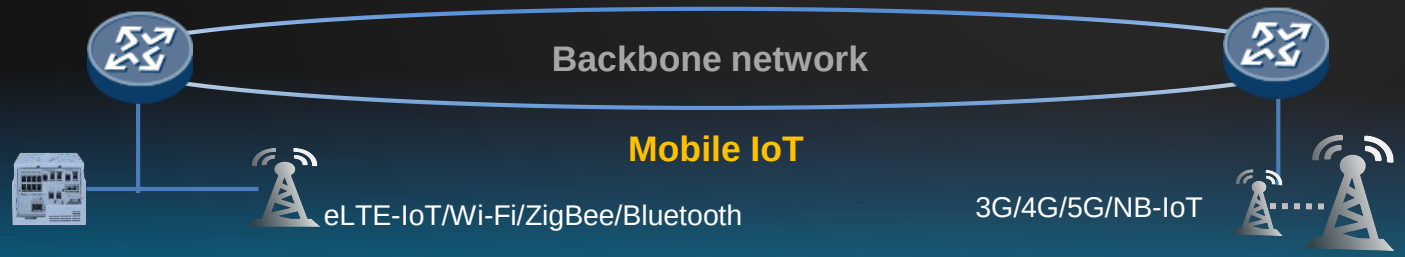
- Positioning and navigation
- Passenger self-service
- Self-service customs clearance
- Baggage reconciliation

A-CDM | AODB

IoT platform | Big Data analytics | Video surveillance | ICP

**Cloud platform**

Computing | Storage | Network | O&M




## E2E Visualization and Collaboration

**Integration + Verification**
**(Comprehensive operations control, security, and services)**

## Cloud, Big Data, AI, Data mining

**Integrate industry capabilities**
**(Platform + Ecosystem)**

## Cornerstone of Digital Transformation

**Mobility + IoT+ Smart processes**
**Virtual reality, Digital twin, Augmented reality**
**Video**
**(Wireless, wired, and chips)**




# 4. Aviation's Environmental Impact Management

# Environment management

CARBON MANAGEMENT

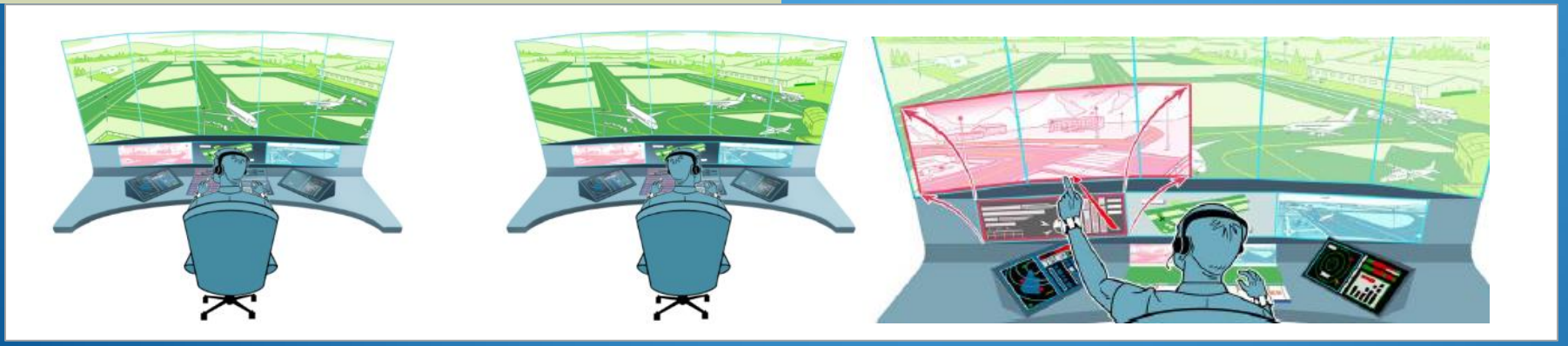
MEASURES FOR SUSTAINABLE WATER MANAGEMENT

CONTRIBUTE TO THE GOOD ECOLOGICAL AND CHEMICAL STATUS OF THE WATERCOURSES

# 5. Management of Human Ressources

## The changing nature of work

**BIG DATA & CONNECTED SYSTEMS**



**MULTI SENSORY INTERACTION**


**AUGMENTED REALITY**

# The changing nature of work
## *Emerging occupations (Examples)*

| ATC/ATM VIRTUALIZATION AND AUTOMATION | AUTONOMOUS SYSTEMS | SECURITY AND CYBER-SECURITY | ELECTRIC AND SUSTAINABLE AIRCRAFT |
|---|---|---|---|
|  |  |  |  |
| • Remote tower controllers<br>• AI engineers/VR experts<br>• Big data analysts<br>• Robotics engineering | • Drone operators<br>• Automated vehicle operators<br>• Designers of autonomous vehicles<br>• Safety officers for unmanned systems | • Software and AI engineers<br>• Big Data and analytics experts<br>• Security (& cyber security) experts<br>• Legal services personnel and ethics and privacy protection specialists | • Energy and maintenance engineer<br>• Electrical engineer/ Alternative Vehicle Developers<br>• Climate Change Reversal Specialist<br>• Consumer Energy Analysts<br>• Battery Technician<br>• Solar Flight Specialists |

# Interdisciplinary master “IT applied in aviation”

- The purpose of this advanced Master’s programme is to provide students with a broad range and depth of interdisciplinary knowledge;
- Will be organized by **modules, function of background of graduates;**
- Will use **new modes of delivery**:
  - **distance,** through new forms of personalized learning,
  - strategic use of **open educational resources, virtual mobility,**
  - **European internships** in the main air transport employers.

## Master Study Programme

# “ GREEN, SMART AND INTEGRATED TRANSPORT AND LOGISTICS”

United Nations Educational, Scientific and Cultural Organization

UNESCO Chair on Engineering for Society, University Politehnica of Bucharest, Romania

Master taught in English
- 2 years, 4 semesters, 120 ECTS
- 30 students subsidized,
- 20 with fees

Organized in the UNESCO Department **"Engineering for Society"**

In partnership with universities and aviation institutions abroad, in line with UNESCO's mission to provide education for sustainable development.

International interdisciplinary group of teachers and lecturers, combined with professionals from professional practice:

*Constantin BRĂTIANU, Mihnea COSTOIU, George FIRICAN, Cătălin RADU, Mihaela POPA, Dorinela Costescu, Florin Rădulescu, Pepina Miteva, François Marmier, Sorin Eugen ZAHARIA*

# Thank you for you attention!