Performance assessment in ATM– towards better collaborative methods
Cook, A.J.


The WestminsterResearch online digital archive at the University of Westminster aims to make the research output of the University available to a wider audience. Copyright and Moral Rights remain with the authors and/or copyright owners.

Whilst further distribution of specific materials from within this archive is forbidden, you may freely distribute the URL of WestminsterResearch: ([http://westminsterresearch.wmin.ac.uk/](http://westminsterresearch.wmin.ac.uk/)).

In case of abuse or copyright appearing without permission e-mail repository@westminster.ac.uk
Performance assessment in ATM – towards better collaborative methods

07 February 2018
SJU, Brussels
Overview

• Background (three aligned perspectives)
• Objectives
• The bigger picture
• The smaller picture
• Wrap-up and next steps (1640ish)
Background
Background

SJU perspective

• SESAR1
  - 100% bottom-up, from projects to MP
• SESAR 2020
  - bottom-up and top-down
  - Initially ER ‘performance projects’ and PJ.19-04; widened ...
• Planning underway from Sept. 2017
• Already an achievement
Background

SESAR 2020 Scientific Committee, Task Force 3

• First meeting 14-15FEB17
• 10 members, plus observers from ECTL, PC and DG MOVE
• Task Force 3: Performance Measurement
• Focus on horizon scanning (e.g. defining new indicator requirements beyond 2035) and refining/repairing existing indicators
Background

SESAR 2020 Scientific Committee, Task Force 3

- Objectives
  - identify key challenges in performance measurement in wider context of air transport, especially regarding missing indicators for future system
  - establish performance measurement ‘scoping framework’ to capture state of the art re. existing & new indicator development
  - use scoping framework to inform the Scientific Research Agenda TF
  - select indicators for future work; identify initial solutions for developing missing indicators, outlining specifications for potential further research

- Wider context of ‘scoping framework’: horizontally (beyond 2035) and vertically (including the intermodal context)
- Differentiation from PJ.19-04 “performance framework”
  - activities complementary & mutually aligned

Very much in listening mode today
Background

SESAR 2020 KTN – Engage

www.engagektn.net
Background

SESAR 2020 KTN – Engage

Advanced Logistics Group (ALG)
AGIFORS - Airline Group of the International Federation of Operational Research Societies
Air Traffic Controllers European Unions' Coordination (ATCEUC)
airBaltic
Airport Regions Conference (ARC)
American Airlines
ANS Czech Republic
Association for the Scientific Development of ATM in Europe (ASDA)
Autoridade Nacional de Aviação Civil (ANAC)
Barcelona Supercomputing Center (BSC)
Belgacom
Boeing Research and Technology Europe (BR&T-Europe)
Bundeszentralamt für Flugsicherung (BfS)
Civil Aviation Authority (CAA)
COOPANS Consortium
Department for Transport (UK)
Direktorat Civil aviation of the Republic of Serbia (DCV)
European Maritime and Port Services Network (EUNMSTNET)
European Parliament (EP)
Executive Airlines
Ferrovial Agrupación
Finair
FlightGlobal
Flughafen München / Munich Airport
Gatwick SL
Helisat
HEILMAY - High Endurance Multipurpose Aerial Vehicles
Honeywell Aerospace
HungaroControl
Icelandair
IFSTTAR - Institut Français des Sciences et Technologies des Transports, de l’Aménagement et des Réseaux
INFOM - Institut für Operations Research und Management GmbH
International Air Transport Association (IATA)
International Federation of Air Traffic Controllers Associations (IFATCA)
Irish Aviation Authority (IAA)
LFV - Luftfartsverket
London Luton Airport
Lufthansa Systems
Manchester Airport
Monarch Airlines
NATS
Navair
Network Manager - nominated by the European Commission
NEXTOR II Consortium - University of California, Berkeley and University of Maryland
PACES Aerospace Engineering & Information Technology
Pegasus Airlines
QinetiQ Ltd
Raytheon UK
Sabre Airline Solutions
SWISS - Swiss International Air Lines
Thomas Cook Airlines
TÜBİTAK – The Scientific and Technological Research Council of Turkey
Turkish Airlines

Performance Assessment Work Forum, SJU, Brussels, 07FEB18
Background

SESAR 2020 KTN – Engage

Adapted from SJU (2018)
Background

SESAR 2020 KTN – Engage

‘exploratory’  ↔  ‘industrial’ (more-applied)

Brick wall? Conspiracy? Mechanism & motivation ... dialogue
Objectives
Objectives

Agenda (1/2)

• Increase awareness of ER projects working on performance
  • exchange of materials, slides this morning
• Discuss issues and needs related to evolution of the performance framework to ensure alignment with stakeholder expectations, future policy objectives, and development of (e.g. decision-support) tools
  • initiated by presentation from PJ.19-04
  • interactive sessions this afternoon (stakeholder focus)
• Identify potential direct uptake by PJ.19-04 of results (e.g. KPIs, open models, datasets, tools, etc.) from ER performance projects
  • interactive sessions this afternoon
  • not constrained by funding and time just yet – focus on what
  • budgets etc. in follow-up
    (indicative funding in a moment)
Objectives

Agenda (2/2)

- How to exploit results of ER performance projects in Wave 2
  - wider perspective than PJ.19-04 (unconstrained brainstorming)
  - ‘barriers and enablers’ in ER slides
- Identify research needs that could be addressed by ER4 projects to:
  (i) drive evolution of performance f’work: better aligned stakeholders’ expectations
  (ii) support gaps identified by PJ.19-04 where further support beneficial
  - push-pull, dialogue
  - mutual complementarity
- 3-hour session this afternoon
  - planned scope for ample dialogue and debate
  - something to add? (cookaj@westminster.ac.uk)
  - next steps
Objectives

Forthcoming funding

• ER4
  • expected call: Q1 2019
  • expected start: early 2020
  • overall planned budget: appx. €40M
  • budget per project? – views today; exploiting ER in Wave 2
    (previous ER contributions: typically €600k-1M)

• Engage KTN
  • catalyst funding, 16 (appx.)
  • first call: (appx.) Oct. 2018
  • up to €60k, ‘light touch’
  • submit your ‘thematic challenge’ ideas by 09 March!

www.engagektn.net
The bigger picture
The bigger picture

Innovation Investment Package

Ten partnerships with the industry and Member States were proposed as part of the Innovation Investment Package, and one more followed. The EU’s contribution of €9 billion to the package will unlock a €10 billion investment from the private sector and €4 billion from Member States.

Public-Private Partnerships

Most of the funding will go to Joint Technology Initiatives (JTIs). These are run as Joint Undertakings that organise their own research agenda and award funding for projects on the basis of open calls.

The new Joint Technology Initiatives are active in a number of areas of strategic importance for the EU:

- **Innovative Medicines 2 (IMI2):** to develop next generation vaccines, medicines and treatments, such as new antibiotics (website | factsheet)
- **Fuel Cells and Hydrogen 2 (FCH2):** to accelerate market introduction of clean and efficient technologies in energy and transport (website | factsheet)
- **Clean Sky 2 (CS2):** to develop cleaner, quieter aircraft with significantly less CO2 emissions (website | factsheet)
- **Bio-based Industries (BBI):** to use renewable natural resources and innovative technologies for greener everyday products (website | factsheet)
- **Electronic Components and Systems for European Leadership (ECSEL):** to boost Europe’s electronics manufacturing capabilities (website | factsheet)
- **Shift2Rail:** to develop better trains and railway infrastructure that will drastically reduce costs and improve capacity, reliability and punctuality (website | factsheet)

A related type of initiative is

- **Single European Sky ATM Research (SESAR) 2020:** to develop the new generation of European Air Traffic Management system that will enhance the performance of air transport (website | factsheet)
The bigger picture

Triple bottom line approach
The bigger picture

Complementarity and gaps

Interdisciplinary

H2020/national Pjs

Policy, regN, ambition
The smaller picture
The smaller picture

Planning for this afternoon

• Please note your stakeholder group
  • stars (*) and hats (^)
  • please bear in mind during the presentations
  • room allocations
  • each group will need a spokesperson (*) and a timekeeper (^?)

• We will reconvene in Beluga, after lunch, for a briefing
  • then disperse into the breakout groups

• *Please* do try to get back from lunch promptly – thank you!
Over to Jose Manuel ...
Wrap-up and next steps
Next steps

This was just the start ...

- Write up results of today (including discussions this morning)
- Add a brief synthesis of the slides (action points and ideas)
- SC and SJU to discuss best way(s) forward and identify actions
- Will be considered in planning for ER4
- Please e-mail me if you think of anything (polite!) on way home
Performance assessment in ATM – towards better collaborative methods

Thank you very much!
Stand-bys
The level of achievement and consequent maturity at each level is described below:

**Exploratory Research covers:**

Pre-TRL1 Scientific Research: **Fundamental exploratory research** investigating relevant scientific subjects and conducting feasibility studies looking for potential application areas in ATM, concentrating both on out-reach to other disciplines as well as educating within.

TRL 1 Basic principles observed and reported: Exploring the transition from scientific research to applied research by bringing together a wide range of stakeholders to investigate the essential characteristics and behaviours of applications, systems and architectures. Descriptive tools are mathematical formulations or algorithms.

TRL 2 Technology concept and/or application formulated: Applied research. Theory and scientific principles are focused on very specific application area(s) to perform the analysis to define the concept. Characteristics of the application are described. Analytical tools are developed for simulation or analysis of the application.

**Industrial Research & Validation (outside the scope of this Call) covers:**

TRL 3 Analytical and experimental critical function and/or characteristic proof-of-concept: Proof of concept validation. Active Research and Development (R&D) is initiated with analytical and laboratory studies including verification of technical feasibility using early prototype implementations that are exercised with representative data.
ER reviews & gates

ATM Excellent Science and Outreach
(Concept outline and identification of potential benefits and risks)

ATM Application Oriented Research
(Initial Concept Description, VALR)

Industrial Research and Validation
(OSED, VALR, VALP)

Gate ER/IR

Gate V1

ER Initial Delivery
ER Final Delivery
V1 Final Delivery

VALP/R/S: Validation plan / report/ strategy
OSED: Operational service and environment definition

Courtesy of SJU (2018)
AWP 2016

‘exploratory’

ER: exploratory research
IRV: industrial research and validation (‘Wave 2’)
VLD: very large-scale demonstrations

‘industrial’

SESAR 2020

(i)
(ii)

Exploratory research area
(i) Excellent science & outreach
Automation, robotics and autonomy
Complexity, data science and Information Management
Environment and meteorology
Performance, economics, regulation and legal
ATM’s role in intermodal transport
(ii) Application-oriented research
High performing airport operations
Optimised ATM network services
Advanced air traffic services
Enabling aviation infrastructure

SESAR AWP 2016 (2015)

Performance Assessment Work Forum, SJU, Brussels, 07FEB18