REDUCING RISK IN THE SESAR R&I PROCESS THROUGH HUMAN FACTORS

Think

THE PROBLEM

- Validation exercises demand a heavy investment to develop prototypes, secure a sim facility and foot the bill for ATCO participation. This puts a lot of pressure of the data generated through each activity, which may not be of much value if unsuitable metrics or collection methods are chosen.

- Many soft skills contribute to extracting useful feedback and ideas from your participants. A positive relationship with the project team and controllers is required in order to gain the key insights into a concept's benefits and drawbacks.

- Inevitably with human-in-the-loop exercises and complex protypes, things go wrong. Adaptive skills and experience are needed in order to react to unforeseen circumstances and take advantage of opportunities to salvage the required outputs.

- If deliverable contributions are incomplete or incorrectly structured, substantial effort can be lost to review cycles; potentially exceeding project budgets. High familiarity with the templates and consolidation process is needed to avoid this.

THINK can help

WHO ARE THINK?

Think Research is an Air Traffic Management and Airports consultancy based in Bournemouth, UK.

We are a data centric consultancy – all our advice is evidence based and validated using appropriate analytical techniques.

We work with our clients to develop concepts and technologies from initial idea to implementation using a range of services to mature, validate, standardise and deploy solutions that meet future performance requirements:

- We are seasoned SESAR R&I Experts, with the required capabilities to contribute to, or lead, all SESAR solutions.
- We are simulation specialists – with a range of fast and real time simulation tools and experience.
- We understand validation, we know how to design simulations to produce the necessary evidence.
- We understand the SESAR approach to Human Performance Assessment (HPA).
- We can plan and execute HF activities such as workshops, interviews and demonstrations.
- We can take advantage of extensive prior experience to ensure that risks are understood, and the process remains on schedule and within budget.

This brochure explains how we can reduce the risk of SESAR R&I projects, from a HPA perspective

Author: Jonathan Twigger, ATM Consultant

Jonathan is an ATM consultant specialising in Human Performance and human-in-the-loop concept validation. He has coordinated several validation projects for NATS R&D and developed expertise within the SESAR 2020 R&I programme. Most recently, Jonathan has held the role of Solution Lead for PJ.02-01 in Wave 1.

Author: Diana Toma, ATM Consultant

As well as being a Human Factors specialist, Diana has extensive experience working with various ATC stakeholder representatives, ANSP's and has also been involved in key SESAR R&I projects during her career. She has significant technical knowledge and experience running projects from concept development through to validation.

IN THIS BROCHURE...

REDUCING RISK IN SESAR R&I

Participating in a SESAR R&I Solution is a significant undertaking and does not carry guarantee of success.

THE GAMBLE

Validation exercises demand a heavy investment to develop prototypes, secure a simulation facility and ATCO participation. This puts a lot of pressure of the data generated through each activity, which may not be of much value if unsuitable metrics or collection methods are chosen.

STARTING OFF ON THE RIGHT FOOT

Many soft skills contribute to extracting useful feedback and ideas from your participants. A positive relationship with the project team and controllers is required in order to gain the key insights into a concept's benefits and drawbacks.

BOUNCING BACK

Inevitably with human-in-the-loop exercises and complex protypes, things go wrong. Adaptive skills and experience are needed in order to react to unforeseen circumstances and take advantage of opportunities to salvage the required outputs.

STUCK IN A LOOP

If deliverable contributions are incomplete or incorrectly structured, substantial effort can be lost to review cycles; potentially exceeding project budgets. High familiarity with the templates and consolidation process is needed to avoid this.

THINK'S HISTORY IN SESAR R&I

SESAR 1 (2008-2016)

As E-OCVM and simulation experts, we were well-positioned to assist contributors when SESAR R&I began. We helped multiple clients to extract maximum value from their validation exercises and progress their concepts' maturity.

P04.07.02
P04.07.08
P05.04.02
P05.06.03
P05.07.02
P05.07.03
P06.08.01
P06.08.04

BUDDING SPECIALISTS

We applied our deep expertise in validation and concept development across eight projects, covering controller team organisations, separation management and coupled AMAN/DMAN.

SESAR 2020 WAVE 1 (2016-2019)

Throughout Wave 1, we were approached by ANSPs across Europe to contribute our knowledge of the SESAR R&I process and deliverables. Our Wave 1 activities tackled a range of topics including wake turbulence sepearation optimisation, ADS-C and generic controller validations.

PJ.31 VLD
PJ.10-01C
PJ.10-02a
PJ.10-02b
PJ.10-06
PJ.02-01
PJ.01-01
PJ.01-02
PJ.18-02a

BRANCHING OUT

Building on experience, in SESAR 2020, we have extended our capabilities to support partners in Human Performance Assessments, CBAs and solution management.

Think

SESAR R&I HF DELIVERABLES

HISTORY IN SESAR

The Think team have been involved with SESAR R&I from the beginning and supported over a dozen solutions during Wave 1.

KNOW THE PROCESS

Having supported validation, HF, concept and solution management contributions; we have the knowledge to enable us to succeed in SESAR R&I.

FRONT OR BACK SEAT

Whether its supporting one exercise or leading the solution through the maturity gate, we can slot into any role within the wider solution effort.

HP Assessment Plan (HPAP):
- Concept assumptions
- HP Arguments, Issues and benefits described
- HP activities planned

Validation Exercise:
- Evidence collected
- Further understanding of solution
- Approach adapted, if needed

HP Assessment Report (HPAR):
- Actual Evidence described
- Requirements and Recommendations provided
- HP maturity assessment

HP Log:
- Concept assumptions defined
- Relevant HP arguments identified
- HP Issues and benefits tracked
- Expected/Actual Evidence logged
- HP requirements and recommendations register
- HP maturity assessment performed

PART OF THE TEAM

We believe in a collaborative approach and will fully engage with the project team the develop ideas and provide assurance to stakeholders.

GETTING STUCK IN

While we're in the sim room, we're thinking on the fly and adapting our approach to extract the maximum value from each exercise.

DIY

If you're investing in the longer term development of HF capabilities, we can deliver bespoke training or act in a supportive role to your in-house HF specialists.

Think

WIDER SESAR R&I DELIVERABLES

VALIDATION PLAN (VALP) PART I

Human Performance objectives and success criteria are represented within the exercise plan experimental design. The planned approach to data collection methods and analysis are defined.

SPR-INTEROP/OSED PART I

The OSED contains concept descriptions and a large dataset of functional requirements, some of which are categorised as ‘Human Performance’. The HP contributor ensures that these are properly documented and maintained.

VALIDATION REPORT (VALR)

The objectives defined in the validation plan are reported against once the exercises have been executed. This report discusses HP findings in a narrower scope compared to the HPAR.

CONTEXTUAL NOTE

This document provides a condensed view of the solution data pack for external stakeholders who may be looking to implement the concept. The HP implications of which are summarised for accesibility.

RTS DATA COLLECTION

SELECTION OF METRICS

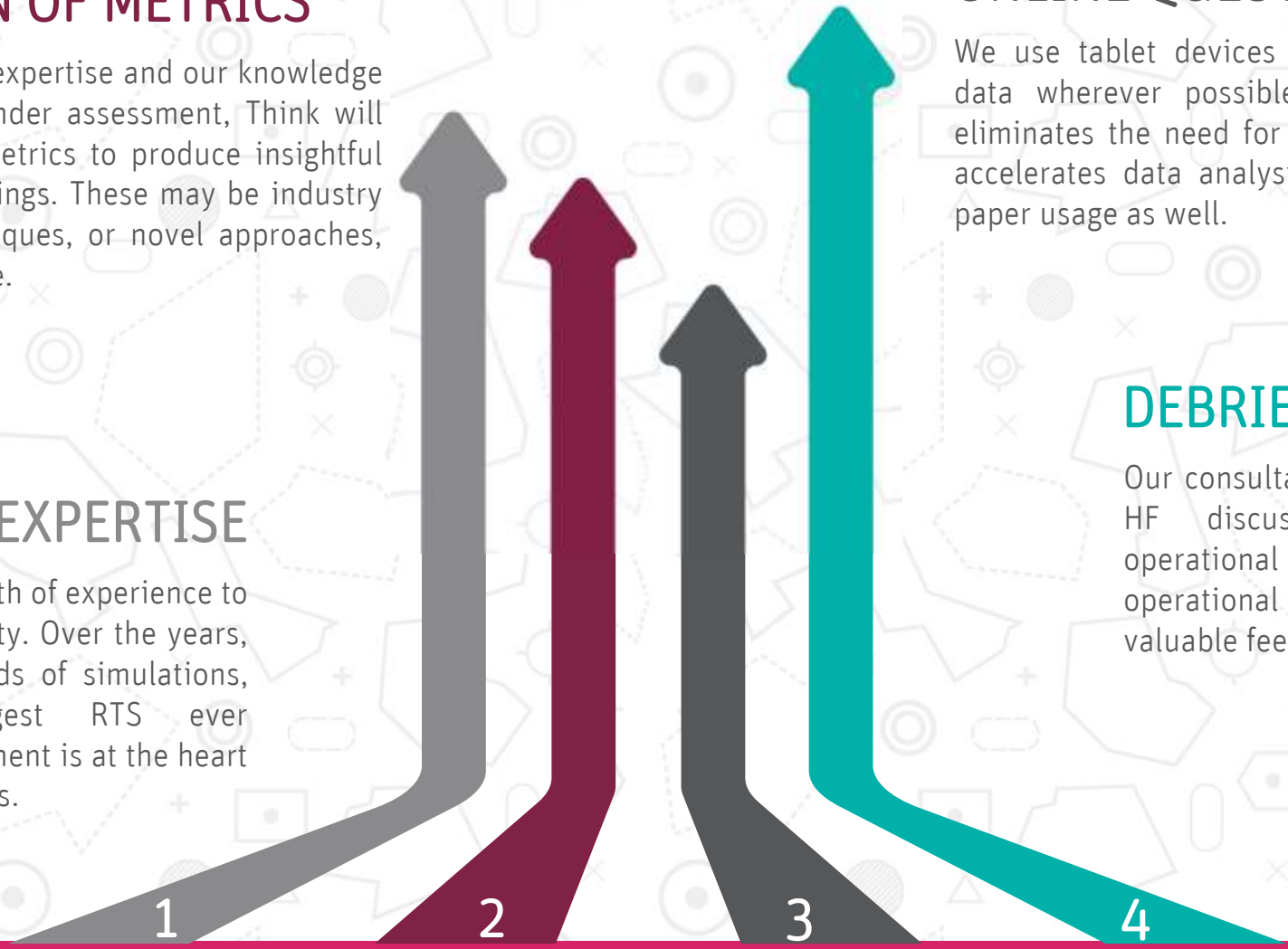
2

Based on our HF expertise and our knowledge of the concept under assessment, Think will select the best metrics to produce insightful and valuable findings. These may be industry recognised techniques, or novel approaches, where appropriate.

SIMULATION EXPERTISE

1

Think can bring a wealth of experience to every validation activity. Over the years, we have lead hundreds of simulations, including the largest RTS ever performed. HP assessment is at the heart of each of our exercises.



ONLINE QUESTIONNAIRES

3

We use tablet devices to gather survey data wherever possible. This not only eliminates the need for transcription and accelerates data analysis, but minimises paper usage as well.

DEBRIEF SESSIONS

4

Our consultants are comfortable leading HF discussions with groups of operational staff. We have the operational knowledge needed to extract valuable feedback and prompt debate.

Think

iSA DATA COLLECTION

WORKLOAD ASSESSMENT

Workload assessment is essential when introducing new technologies.

Optimum workload is a key enabler of increasing capacity through achieving peak human performance.

WHAT'S ISA?

ISA was first developed for use in Human-In-The-Loop Real Time Simulations for ATC research and development simulations.

The purpose of the ISA technique is to continually ask a user the same question (e.g. "How do you rate your workload?") and get their opinions over time on a scale.

BACK IN THE DAY

Traditionally, an analyst would request a workload rating either verbally, or using flashing lights on a workload scale display.

However, these methods are intrusive and distractive. Also, it is not practical to assign one analyst per user for parallel session.

THINK'S iSA

Our iSA is a portable, electronic version of the commonly used ISA.

Using this, you will get an indication of the effect of the test conditions on the user's perceived workload.

Think

RUNNING SESAR R&I EFFICIENTLY

Through each of our prior contributions, we've developed ways that help us to deliver SESAR R&I in a highly-efficient way while improving quality.

EXECUTION PHASE:

- Think consultants are used to working alongside technical support experts to keep simulations running smoothly and on schedule.
- Traffic samples are almost impossible to get right. We pay close attention to participant feedback and make small adjustments where needed.
- Similarly, if unexpected opportunities present themselves or ATCOs put forward valuable ideas, we'll work to make these a reality.

REPORTING PHASE:

- We're able to pair metrics together and dig deeper to create valuable data insights for out reports.
- Through our approach, we can generate a snapshot of key KPA outcomes with a short turnaround following the end of the exercise.
- We have great familiarity with the SESAR R&I deliverables. As such, our contributions can be easily consolidated at solution level, reducing effort and the risk of delays.

PLANNING PHASE:

- We proactively engage with stakeholders to be certain that everything is covered in the planning documents.
- We build contingency into our planning to ensure resilience for unforeseen obstacles.
- We like to do the work ahead of time to establish and trial our approach to data processing before the exercise takes place. This allows us to hit the ground running.

Think

IN SUMMARY

How we can uniquely support our clients in Wave 2

Summary of what Think can offer in Wave 2:

- We are seasoned SESAR R&I Experts, including in the HPA process.
- We have the required capabilities to contribute to, or lead, all SESAR R&I deliverables.
- We are RTS specialists, both from a validation and a human factors perspective.
- We can plan and execute HF activities such as workshops, interviews and demonstrations.
- We can take advantage of prior experience to ensure that the process remains on schedule and within budget.

Each of these advantages contribute to a reduction in risk for our clients. This provides assurance that participating in SESAR R&I will be beneficial to your organisation.

Trajectory Based Operations

Remote and Digital Tower

Wake and Time Based Separation

Airport CDM

Performance Based Navigation

Flexible Use of Airspace

Unmanned Aerial Systems

Runway Optimisation

Virtual Centre

Enterprise and Airspace Architecture

Airspace Change

ATCO Team Organisation & Training

Think
ATM & Airports Consultancy

Think Research Ltd
3 Branksome Park House, Bourne Valley Road
Bournemouth, UK, BH12 1ED

+44 (0) 1202 765 654
info@think.aero
www.think.aero