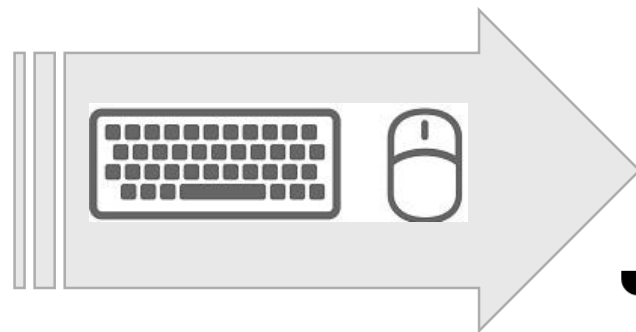




Speech recognition in tower environment

Ramona Santarelli – ENAV Research Activities unit, Engineer





Progress status of SESAR activities



- **MALORCA**, Machine Learning of Speech Recognition Models for Controller Assistance
- **PJ16.04**, CWP HMI

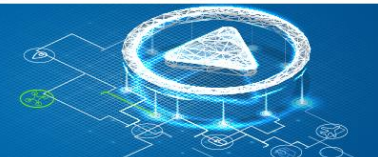
SESAR W1
validations

Recommendations
for W2

- Use of **Machine Learning**
- **Validate** ASR with command prediction in **Tower environment**
- **Update requirements** in consideration of results
- CBA
- ...

- **PJ.05-W2-Sol.97-2**, ASR at the TWR CWP supported by **AI/Machine Learning**
- **PJ.10-W2-Sol.96** Validations in ENR environment

SESAR W2
validations



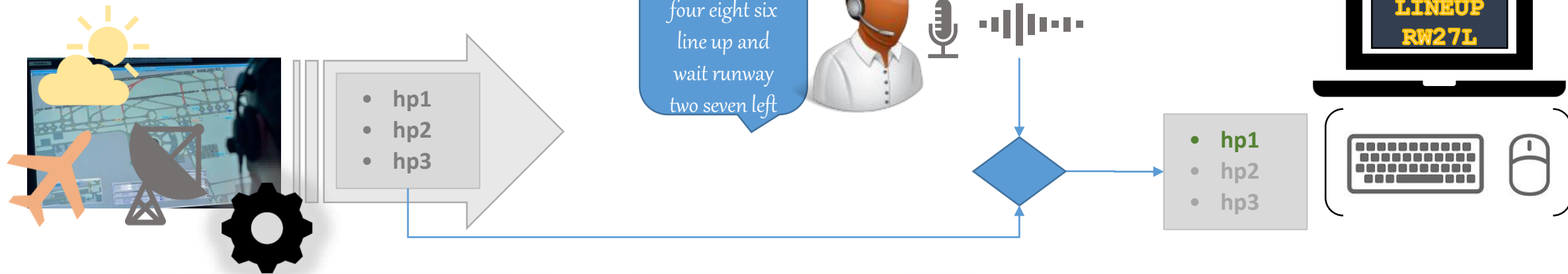
Concept

Command Prediction

- Contextual information
- Prediction model

ASR function

- **Audio** signal from CWP
- Ontology
- Transcription of recognized **words** (speech to text)
- **Concept** extraction (text to concept)



Technical Validations

EXE-004-TRL4-ASR (RTS)

- INDRA and HUNGAROCONTROL

EXE-006-TRL4 (RTS)

- DLR (AT-One) with B4 and COOPANS

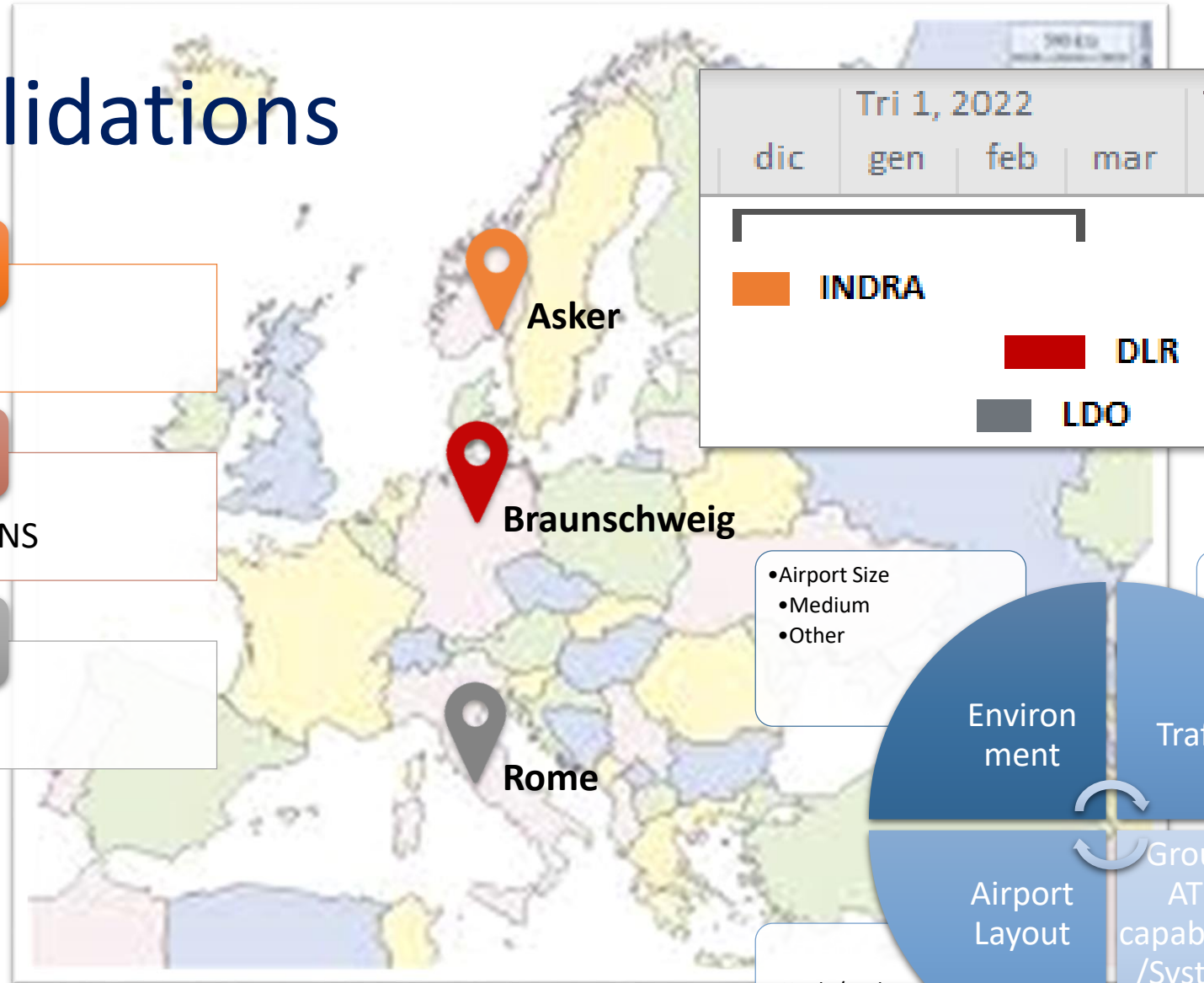
EXE-007-TRL4 (RTS)

- LEONARDO

TRL 2

TRL 4

Final TVALR and CBAT by June 2022



CHANGES ARE EXPECTED IN
PROCEDURES AND INTERFACES,
NOT IN ROLES AND
RESPONSIBILITIES

Use Cases

TWR
Clearance
Delivery
ATCO



AFR2486
LINEUP
RW27L

HIGHLIGHTING OF
RECOGNISED (MULTIPLE)
CALLSIGN

TWR
Ground
ATCO



AFR2486
LINEUP
RW27L

SHOWING FULL RECOGNISED
(MULTIPLE) **COMMAND** IN
HMI

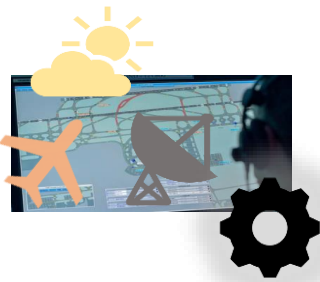
TWR
Runway
ATCO



MANUAL **MANIPULATION** OF
AN ASR OUTPUT



AUTOMATIC **ACCEPTANCE** OF
ASR OUTPUT

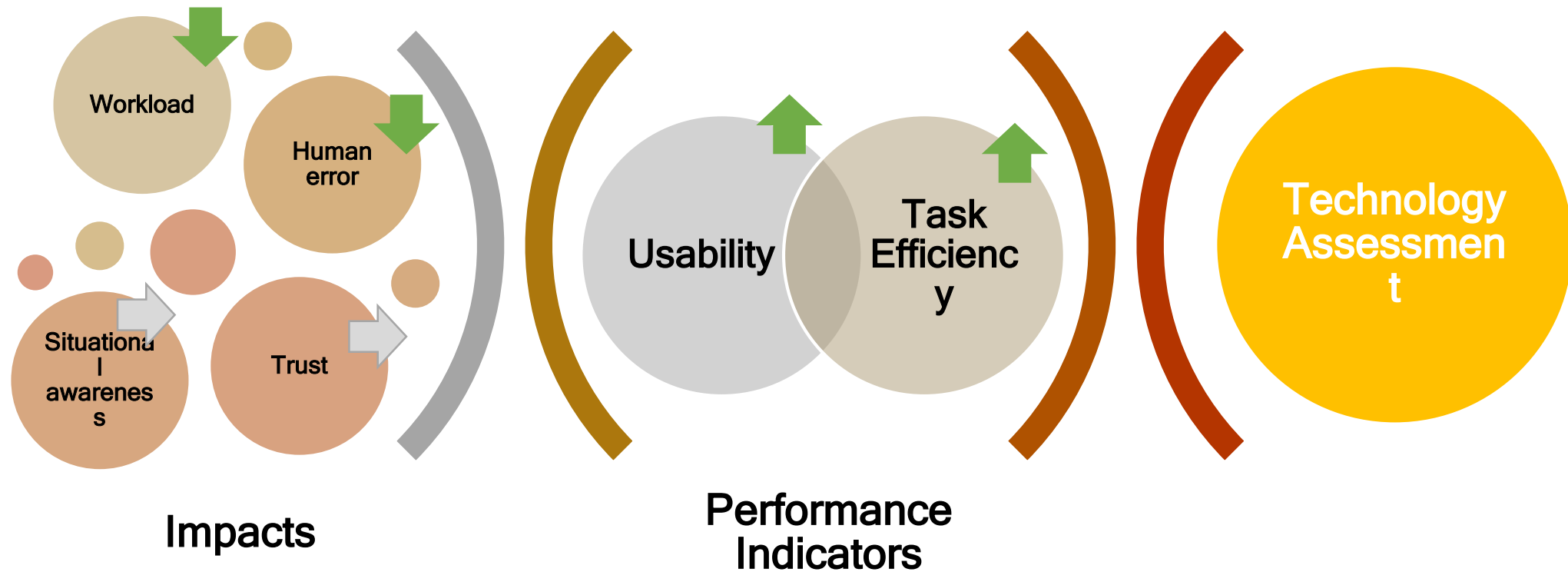


PHRASEOLOGY

Callsign	Command-Name	2nd part of cmd	Value	Unit
	CLEARED	TAKEOFF	runway	
	CLEARED	TOUCH_GO	runway	
	PUSHBACK			
	STARTUP			
	TAXI	Preposition	TX-Point(s)	
	VOID AT		TX-Point	



Expected benefits





For more info:

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<https://www.remote-tower.eu/wp/project-pj05-w2/solution-97/>

