HUMAN-CENTERED DESIGN OF PLANNING AND SCHEDULING TOOLS IN AEROSPACE MANUFACTURING

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INTRODUCTION

The aerospace manufacturing industry is facing **increasing demands** due to global air traffic growth, necessitating the management of **challenges** such as fluctuating raw material costs, supply chain bottlenecks, and new **technology integration** to maintain efficiency.

Planning and Scheduling (P&S) are critical processes, impacting efficiency and performance. Effective P&S ensures timely and efficient aircraft production by allocating resources, sequencing tasks, and coordinating activities, mitigating delays and cost overruns.

The role of **Human Factors in P&S** is increasingly recognized, particularly with AI-assisted systems, as humans bring essential adaptability and decision-making skills to dynamic environments**.**

OBJECTIVES

- Exploring planners and schedulers needs
- Understanding their perspective on artificial intelligent tools
- Examining the interaction between of human factors and operational needs in P&S

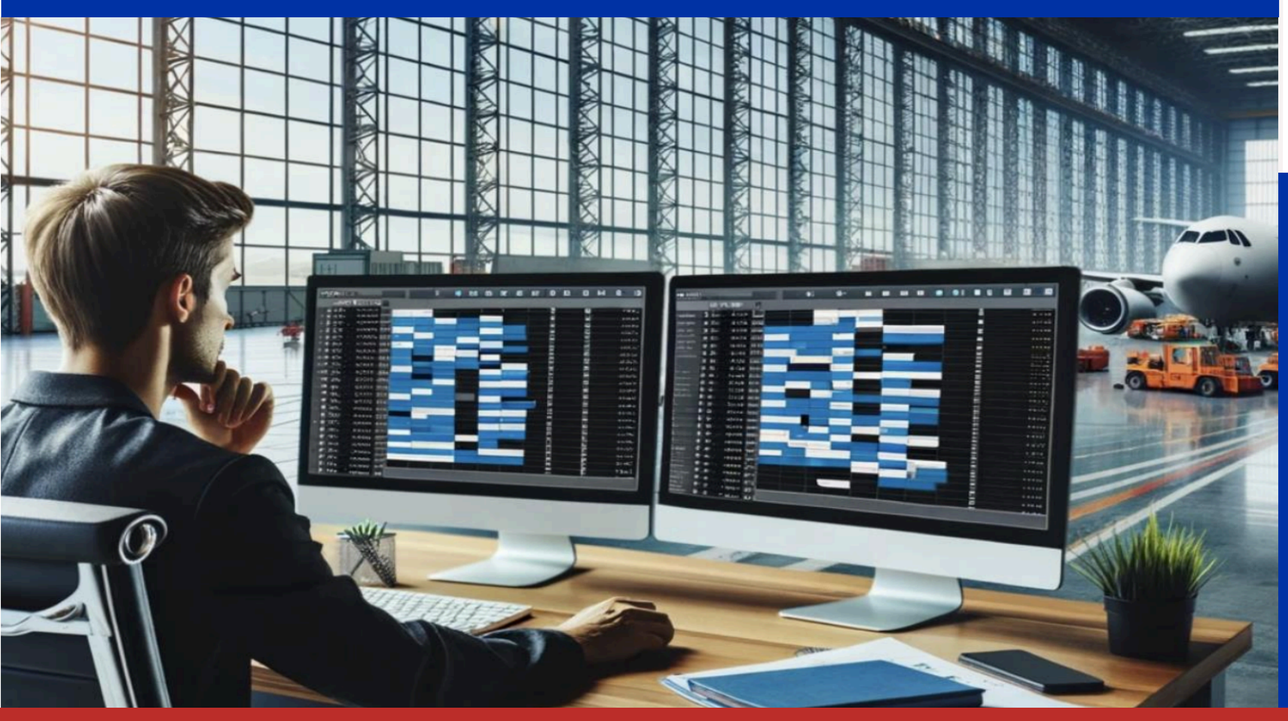
METHODS

Semi-structured Interviews

Card Sorting Technique

PARTICIPANTS

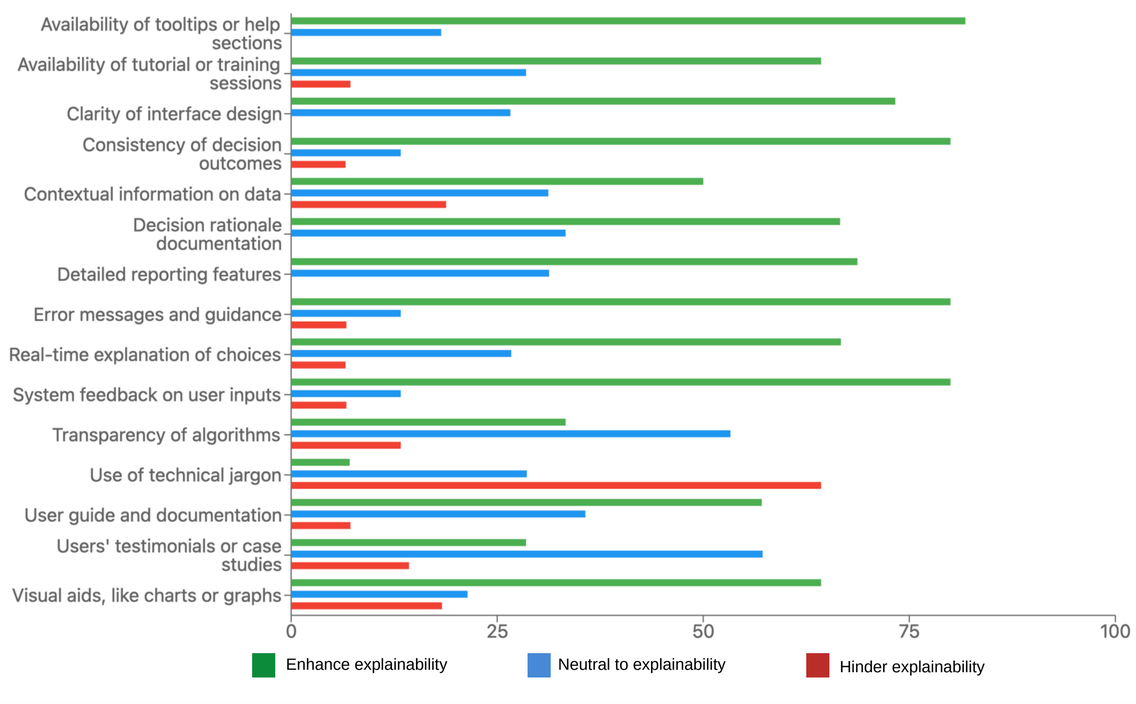
15 professionals (3♀, 12♂) from an European leading aerospace manufacturing organization, with > 4 years of experience in P&S



RESULTS

Themes	Dimensions	Definitions
Need to managing workforce and customers	Allocating human resources	The strategic distribution and redistribution of human assets to fulfill production needs
	Meeting customer requests	The management of high task volumes responding to client strict deadlines and expectations
	Handling workers' resistances	The management of team members' reluctance to use new technologies during their work
Need to prioritize	Task dependency	The criteria for scheduling tasks basing on task urgency and interdependencies
	Task criticality	The criteria for scheduling tasks basing on error susceptibility of the task themselves
	Revenue potential	The criteria for scheduling tasks basing on cost efficiency of the specific activities
Need to handle contingencies	Machinery availability	Possible disruptions related to the accessibility and functioning of equipment
	Time limitations	Handling production timings to meet customer demands, delays can severely disrupt operations
	Quality issues	Possible disruptions related to quality of components, not meeting the standards
	Human performance variability	Need to handle inconsistencies in human behavior that can lead to errors affecting operations
	Weather conditions	Disruption of tasks related to adverse weather conditions preventing to carry out specific tasks

"Please indicate if the following AI system features enhance, are neutral to, or hinder its explainability"



CONCLUSIONS

- Advanced P&S AI systems should prioritize human-centered design principles to ensure that these tools are intuitive and align with the users' needs and requirements
- Incorporating user feedback during the design phase can enhance both the usability and acceptance of these systems
- Integrating of human factors is crucial: the systems should be designed to accommodate human variability and adaptability, vital for improving overall efficiency
- Combining technology and human-centric strategies ensures that the sector can adapt to changing demands while fostering environments that support innovation and workforce well-being

The work is part of TUPLES project - Trustworthy Planning and Scheduling with Learning and Explanations.
The project has received funding from the European Commission' Horizon Europe Research and Innovation program under the Grant Agreement N° 101070149

Want to know more about the project?
Scan the QR code to visit the Tuples website!

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