

Rethinking Decision Making in Complex Work Settings: Beyond Human Cognition to the Social Landscape

Overview



- Qualitative Study
- Findings
- Reflections

Typical view of organizational decision making

Decision

— A choice of action (to solve a problem)



Decision Making

- Is a choice making process
- Is a sequential activity
- Is a mental activity

Decision Theory

- Rational Choice (choosing 'best' option from a set of alternative solutions)
- Bounded Rationality (choosing a 'satisficing' option from a set of alternatives)
- Naturalistic (generate & evaluate solution sequentially)

Decision making in a social setup

- Complex work setting is a cooperative arrangement (CSCW)
 - Distributed setup, strong interconnections, joint working
 - Decision making in a cooperative arrangement
 - distributed between multiple actors
 - requires input/involvement from others
 - cooperate and coordinate with each other to manage distribution and interconnections in decision making ('articulation work')
- Decision Theory
 - Models provides limited account of distribution and interconnections in decision making
 - consensus forming, sharing information, sharing mental models
 - Influence of traditional perception
 - choice making process, sequential activity

Shifting perceptions about decision making

DC	<i>If they want any maintenance work to be done they need the permission of the Apron Control first. The airline operator (handling agent) or the maintenance operator (engineer) will call the Apron Control. Say for example if that aircraft want to do a 'compass swing'. They say 'Yeah, you can do it at that time. Giving you permission'.</i>
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- Another facet of decision making during everyday work performance:
 - cannot be explicitly and clearly identified
 - embedded within work practices and social interactions (Brown 2005. Alby and Zuccermaglio 2006)
 - embodied in actions (Lepora and Pezzulo, 2015)
 - process of deciding involves a host of activities that are interactive and parallel (Hoffman and Yates 2005)

Research Question

How is decision making articulated during work performance in a complex work setting?

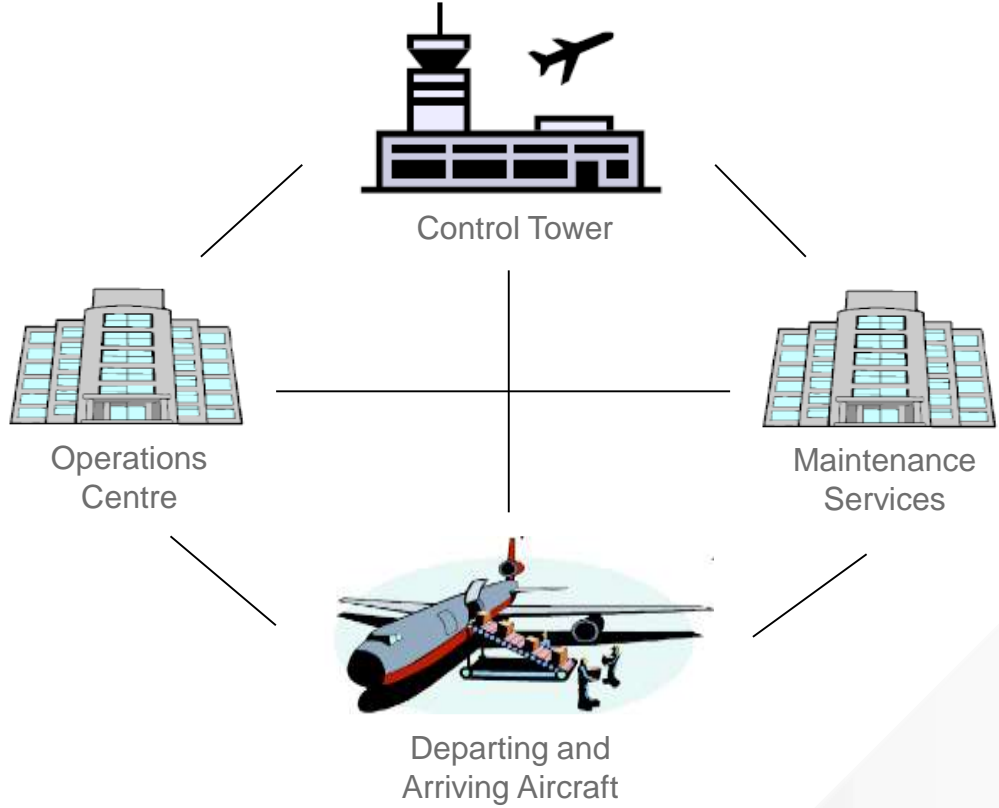
Qualitative Approach

- Field studies in an airport

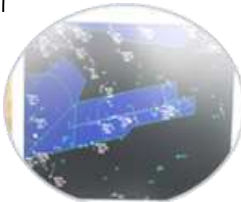


1. <http://www.geograph.org.uk/photo/2994263>

Airport ATC Operations



Supporting Technological Artefacts



Radar



Telephone



Flight Information Systems

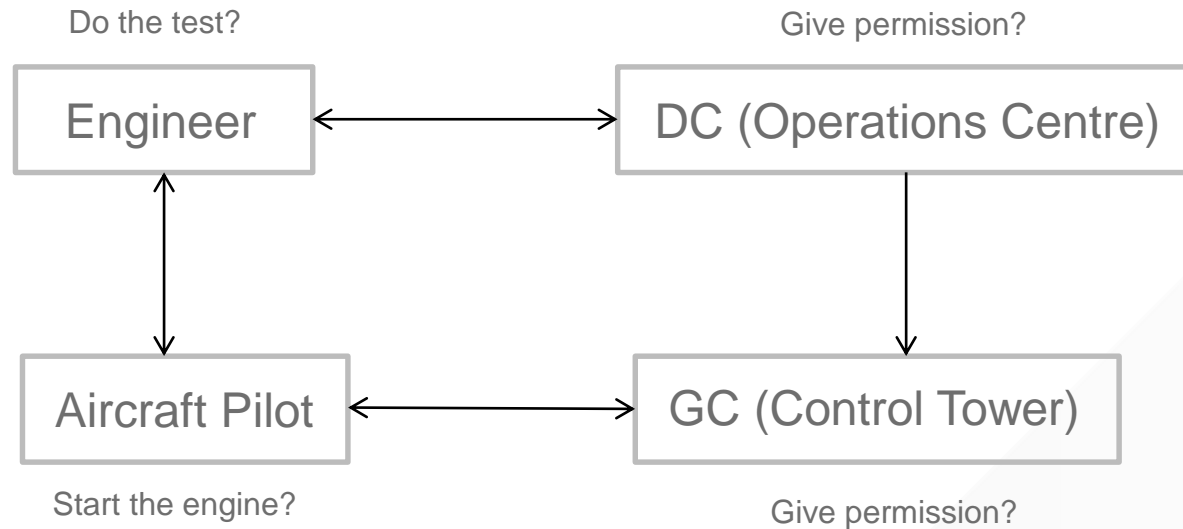


Electronic Flight Progress Strip

Articulating decision making

- **Decision making in the cooperative arrangement is a process of managing dependencies between work activities.**
 - Interconnections in decision making manifest in the form of dependencies
 - Dependencies need to be managed
- **Dependencies in decision making**
 - Information
 - Actions
 - Decision
- **Strategies for managing dependencies in decision making** (categories from data analysis)
 - Associative Structuring
 - Temporal Structuring
 - Explicit Orientation
 - Implicit Orientation

Example Scenario from Data – Aircraft Maintenance Operation



DC That's an **engineer** asking permission to turn an aircraft, turn the engine on its stand. They can do it only after they get the permission from us (**DC - operations centre**). So I now put that information there (EFPS), (Standard form) - Stand 1. In the remarks column put the engine run, idle power. Title is aircraft. When they (**aircraft pilot**) call **ground (GC - Control Tower)** for permission, then the controller looks for the strip and that's it.

Interview Transcript

Conclusion

- In the cooperative arrangement of complex work settings:
 - The process of managing dependencies structures participation and contribution to decision making.
 - Decision making is integrated with work performance activities.
- An approach for exploring distribution and interconnections in decision making in the cooperative arrangement of complex work settings.
- A framework to address the social embeddedness of decision making in the cooperative work arrangement

References

- Simon, H. A. (1956). "*Rational Choice and the Structure of the Environment*". *Psychological Review*. 63 (2): 129–138
- Simon, Herbert A. (1979). "*Rational decision making in business organizations*". *The American Economic Review*. 69 (4)
- Lepora NF, Pezzulo G (2015). "*Embodied Choice: How Action Influences Perceptual Decision Making*". *PLoS Computational Biology* 11(4)
- Klein, G. A. (1993). "*A recognition-primed decision (RPD) model of rapid decision making*". In G. A. Klein, J. Orasanu, R. Calderwood, & C. E. Zsombok (Eds.), *Decision making in action: Models and methods* (pp. 138–147). Norwood, NJ: Ablex.