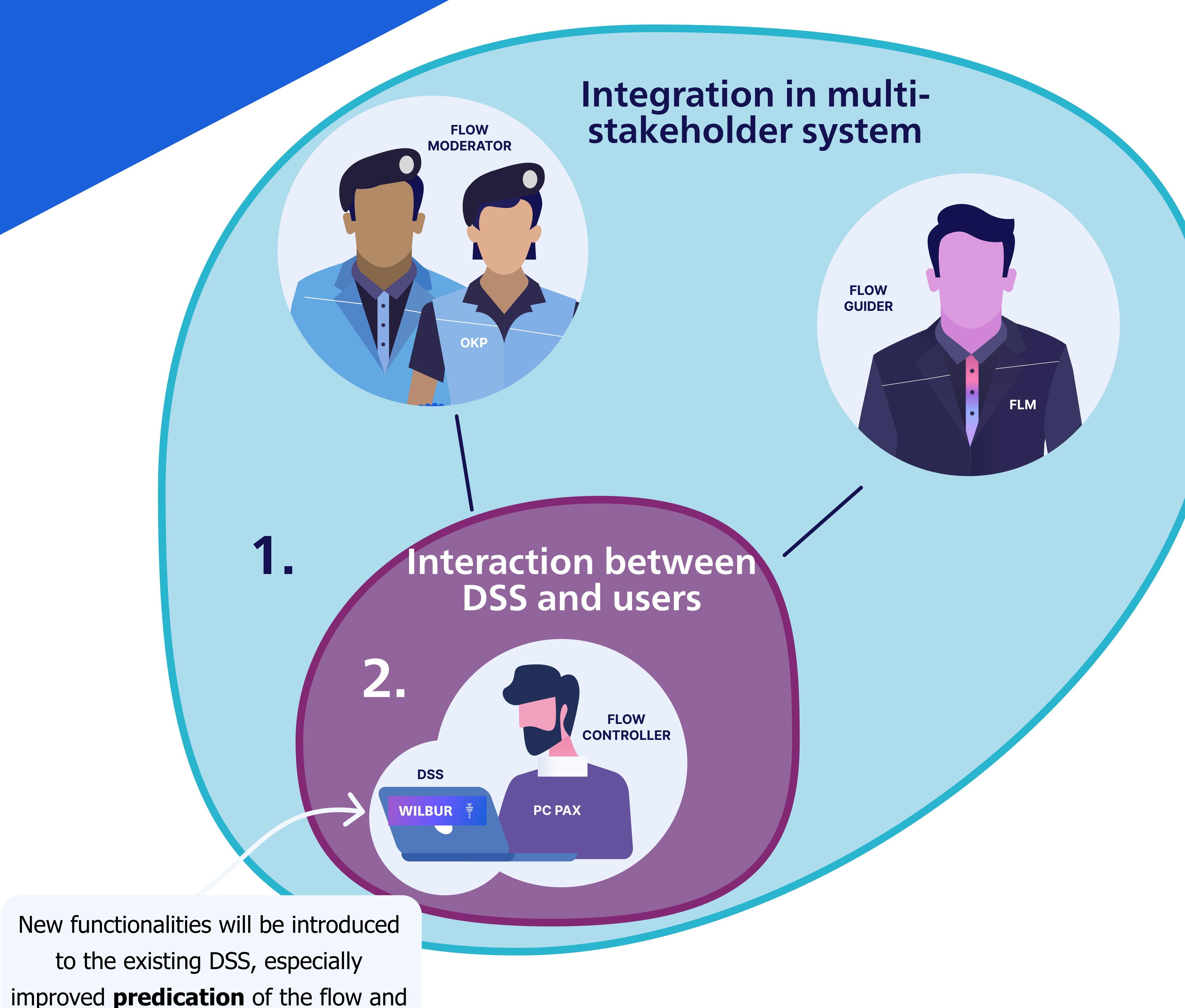
Schiphol

AI-generated recommendations for

decision-making

Investigating the adoption of decision support systems in a multi-stakeholder system

A case study in flow control at Schiphol Airport



Context

Schiphol aims to automate decision making processes in their operation. But adoption issues can be foreseen within the multistakeholder system that it will be implemented in. Interactions between the decision support system (DSS), users and their environment influence the adoption [Sitorius, 2016]. Research regarding adoption in a multi-stakeholder system mention the effects of introducing a DSS on stakeholder interactions, f.e. lack of transparency [Bodelier, 2024; Suresh, 2015], disruption of (power) relations [Haque, 2024], and an increased need for communication [Pontefract, 2018; Figueras, 2024]. But research still lacks actionable guidelines for considering this in the design of a DSS.

Approach

Through conducting observations and an interview study (n=11), the current interactions occurring in the decision-making process were identified. Both between the DSS and the flow controller and between the flow controller and the flow moderator and flow guider. Afterwards, the effects of the introduction of the DSS are discussed and both opportunities and adoption barriers were identified. Based on these, design guidelines are formulated for the interactions on two levels, both between DSS and user and between stakeholders.

Potential adoption barriers for DSS in the multi-stakeholder system:

1 Possible deterioration of interactions between flow controllers, flow moderators and flow guiders

In the current decision-making process, tensions are present between flow controller, flow moderator and flow guider due to **a lack of mutual understanding and a lack of transparency**. Although, flow controllers do have a **large dependency on the interactions** with the other parties in the decision-making process. 2. Flow controllers experiencing difficulties combining subjective insights with recommendations given by DSS

In the current decision-making process, flow controllers use a **combination of different sources of information** for their decision-making, from the DSS, camera images and input from both the flow guiders and flow moderators. As information in the current DSS is **not** always accurate and does not represent the complete situation.

1. Guidelines for integration in multistakeholder system

Have transparency in decision making

Flow moderator and flow guider should be able to know which decisions are made and what the reason for these decisions is, to enable them to pursue their operational goals.

Have formalized interactions with the flow controller

Flow moderator and flow guider should have standard interaction

2. Guidelines for user interaction design

Plan decisions ahead

The DSS should enable decision makers to make an initial decision plan and record this in the DSS before the critical moments, that can be adjusted in case of large changes in...

Receive alert in case of change

DSS should filter changes in information according to relevance on previously made plan and only alert decision maker in case

Receive explanation of recommendations

DSS should provide explanations to decision makers that explain why decisions are taken, based on the effect these decisions on the situation.

Gather subjective insights alongside predictions

The DSS should stimulate decision makers to gather subjective insights, either from their own experience or