

Designing scenarios: the challenge of a multi-agent context for the investigation of authority distribution in aviation

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Abstract

To better understand the issue of authority distribution between airborne (cockpit) and ground (air traffic control) side in the aeronautical domain, the design of scenarios and related a priori-evaluations is essential before implementing resource-intensive human-in-the-loop simulations. Currently used methods are considered more as “a bunch of guys sitting around the table” (BOGSAT). Describing the aeronautical domain as a complex multi-agent system with distinctive needs, the development of scenarios requires a structured multi-faceted procedure to meet defined success criteria as well as the variety of demands from different scenario users. We present a multi-stage process used in defining scenarios for the specific situations of separation and collision avoidance within the future air traffic management. Part of this process was the application of two Group Elicitation Method (GEM) sessions with a total of 12 domain experts to obtain the essential scenario elements based on experience. A categorization allowed a systematic assignment of collected viewpoints to structural categories, which supported the description of both declarative and procedural perspectives. The methodological relevance of such an integrated approach through combining the advantages of qualitative and quantitative methods will be discussed.

Introduction

Scenarios for developing the future ATM

Within the air traffic management (ATM) domain, the demand has been noted to improve the technologies and systems currently in use through implementing European-wide initiatives in the Single European Sky Aviation Research (SESAR) program. The essential question is how we can adapt today’s ATM services to deal with future air traffic increases, which according to EUROCONTROL STATFOR (2006) are estimated to multiply by a factor between 1.7 and 2.1 until 2025. Due to profound technological changes, an in-depth change of the role of human actors can be expected, which will consequently impact the ways of sharing or distributing authority. There is, however, a clear statement that the human operator will remain

In D. de Waard, F.O. Flemisch, B. Lorenz, H. Oberheid, and K.A. Brookhuis (Eds.) (2008), *Human Factors for assistance and automation* (pp. 359 - 371). Maastricht, the Netherlands: Shaker Publishing.