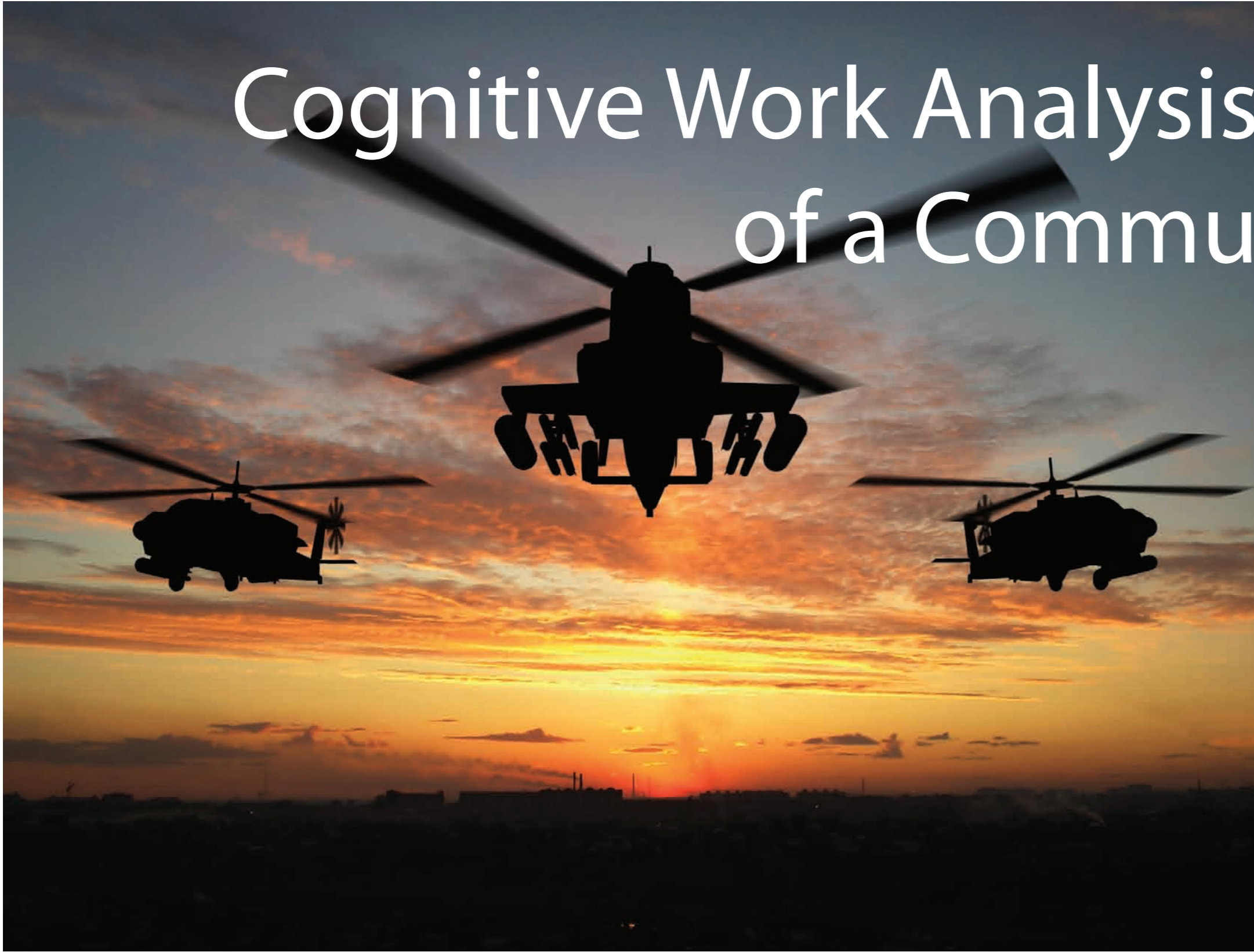


Cognitive Work Analysis (CWA): Driving the Design of a Communications Planning System



Communications planning is an essential part of flying any military aircraft and can be an intensive process. Although the Mission Planning System (MPS) software tool analysed was developed to support this process, its interface is not intuitive and may be considered more hindrance than help.

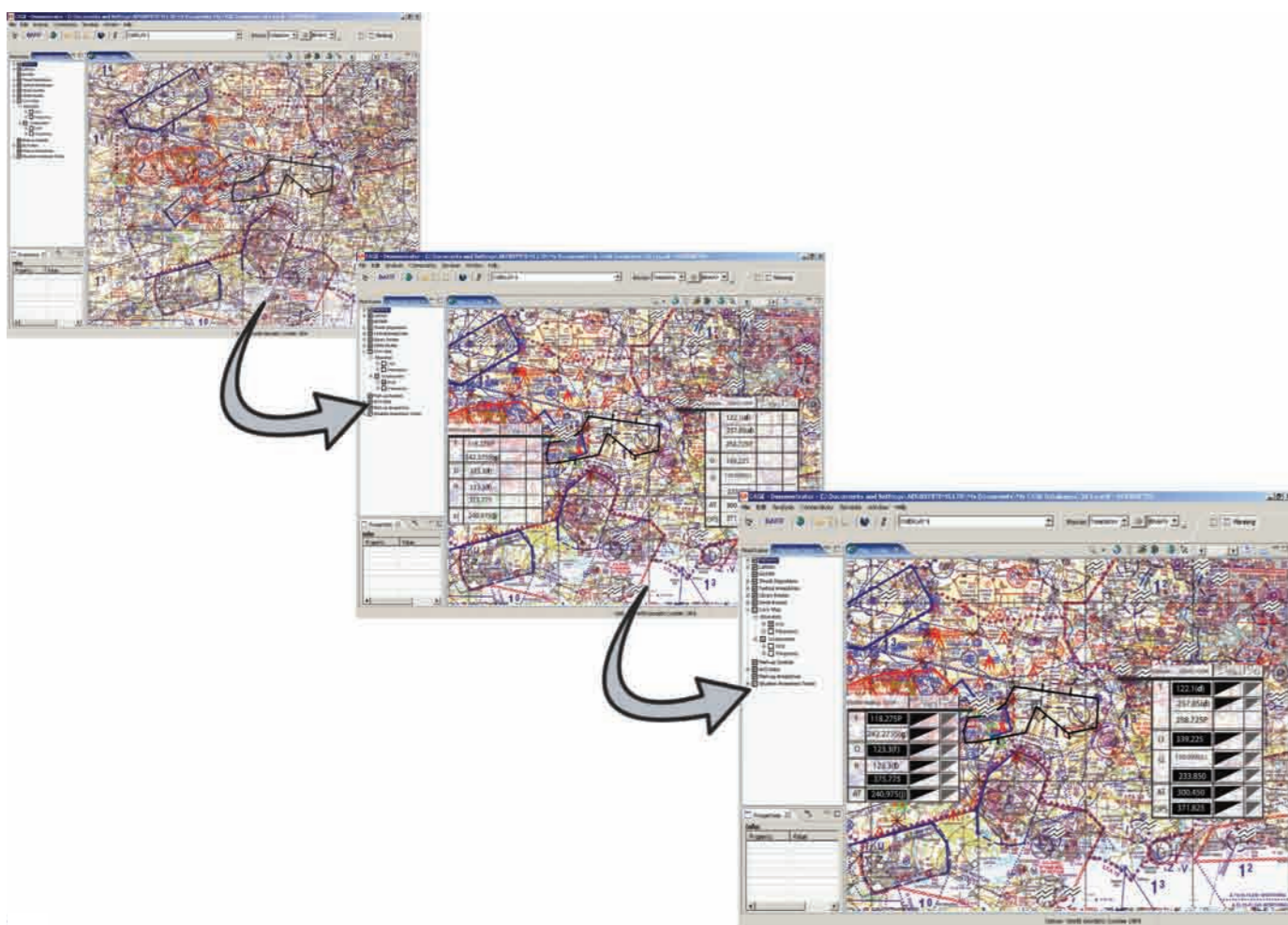


Fig. 1 The Proposed Interface Design.

Activities	Propagator Support Activities	Template Development	Mission Specific Activities	Reinitialisation of Current Plan	Activities	Propagator Support Activities	Template Development	Mission Specific Activities	Reinitialisation of Current Plan
Air to air comms					Air to air comms				
Air to ground comms					Air to ground comms				
Updates / check frequencies					Updates / check frequencies				
Route relevant frequencies					Route relevant frequencies				
Route relevant operating parameters (power)					Route relevant operating parameters (power)				
Route relevant operating parameters (altitudes)					Route relevant operating parameters (altitudes)				
Secure comms and encryption					Secure comms and encryption				
Zone construction and membership					Zone construction and membership				
Team construction and membership					Team construction and membership				
Concurrently active A/C information (plan/alt)					Concurrently active A/C information (plan/alt)				
Identification of self					Identification of self				
Identification of others (intentions)					Identification of others (intentions)				

Pilot
 Template Administrator
 Ops Staff
 Engineer

MPS Specific Possible System

Fig. 2 Comparing Activity Between the Current and Proposed Systems.

Using CWA a thorough analysis of the system was undertaken, driven by repeated meetings with subject matter experts and an extensive research project focusing on novices' interactions with the system. From the outputs it was made clear that the system does not align to the cognitive processes pilots apply during the communications planning activity. New interfaces were developed with the aim of matching the communications planning interface to the way the pilot intuitively thinks about the problem.

Although the development of map-based planning was the most crucial step forward in better supporting pilots, tabular based presentations of frequencies are still required. However, in the current MPS system, hierarchy of data is not recognised, and terms used are often inconsistent. Repeated insertion of the same information, often in differently labelled fields, is a common requirement. To combat this, the proposed system not only recognises the need for consistency, but the need for automated reproduction of data.

The final stage of the process was to compare the current system with the proposed system, specifically with relation to activity. The Social Cooperation and Organisation phase of CWA allows for the description of activity within a system in terms of what, where and who. By comparing the contextual activity templates (CATs) from the current and proposed system it is clear to see the shift of work from last minute planning by the pilot, to advance preparation by those in more administrative roles. Not only does this allow the pilot to spend more time flying, and less time managing data, but it reduces chance for error, speeds up preparation time and reduces workload for all involved.

Military Benefit:

Through in-service experience it is recognised that the current generation of complex systems may be sub-optimal and would benefit from Human Factors in re-design. The successful re-design of the communications planning aspect of the MPS software is just one example of the advantages brought by CWA; other possible future applications include the Instruction Control Console for the Merlin helicopter, and P BISA found in Challenger 2 main battle tanks.

