



Human-Machine Teaming

711th Human Performance Wing

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Integrity ★ Service ★ Excellence



Automation and Autonomy



Automation

The system functions with no/little human operator involvement; however, the system performance is limited to the specific actions it has been designed to do.

Typically these are well-defined tasks that have predetermined responses (i.e., simple rule-based responses).

Autonomy

Systems which have a set of intelligence-based capabilities that allow it to respond to situations that were not pre-programmed or anticipated in the design (i.e., decision-based responses).

Autonomous systems have a degree of self-government and self-directed behavior (with the human's proxy for decisions).



AFRL Autonomy Vision & Goals



Ensure operations in complex, contested environment



Demonstrate highly effective human-machine teaming

Intelligent machines seamlessly integrated with humans - maximizing mission performance in complex and contested environments

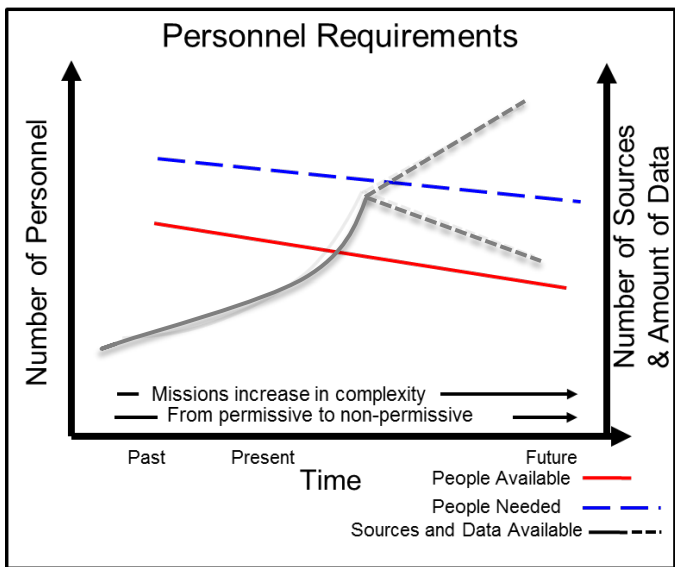
Create actively coordinated teams of multiple machines



Ensure safe and effective systems in unanticipated & dynamic environments



The PED Cell



“We have roughly, let’s say, 6,000 analysts across the DCGS enterprise—by about 2015, [we’ll] need over 100,000 analysts,” ...“And obviously, **we’re not going to do that because we don’t have those people.**” Outgoing AF/A2*



* Lt Gen Larry D. James quoted in “Focusing ISR,” Air Force Magazine, Oct 2013, pg 47

** Air Fore ISR 2023: Delivering Decision Advantage, signed by Lt Gen Robert P. Otto, 2013, pg 14



Human-Machine Teaming for Autonomous Systems



HUMAN DECISIONS
GUIDE MACHINE BEHAVIOR

HUMAN AND MACHINE TEAM
TOGETHER TO MAKE DECISIONS



Current Status

Future Status

Bi-Directional Flow of Information



Human-Machine Teaming Augmentation Framework



- Extraction of objective human measures to inform empirical studies
- Implement a controlled feedback cycle

