Insight into the Acceptance and Adoption of Autonomous Systems by Military Personnel

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Need for Mission Critical Autonomous Systems to be Accepted and Adopted

- Mission critical environments = increasingly complicated with consequences becoming more difficult to isolate and understand
- Warfighters being contingent on systems with various levels of autonomy
- Autonomous system performance is dependable on the integrity of the operator and the autonomous system relationship

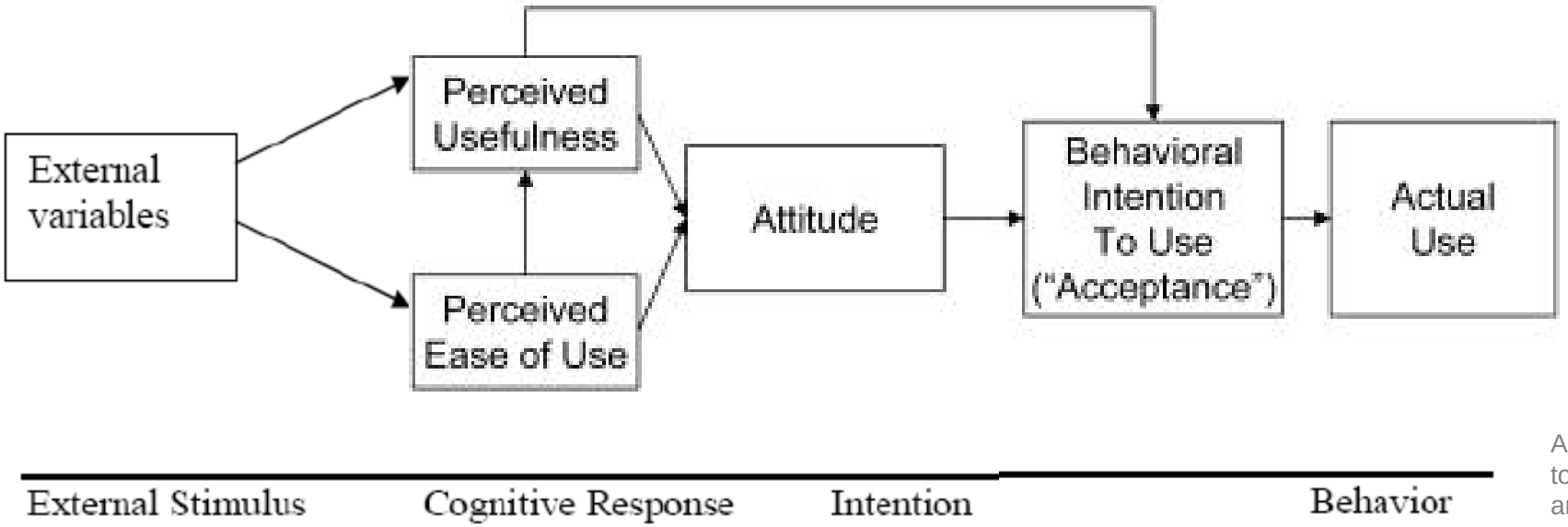
Autonomous System Definition

According to NATO, an autonomous system is:

"a system that decides and acts to accomplish desired goals, within defined parameters, based on acquired knowledge and an evolving situational awareness, following an optimal but potentially unpredictable course of action."

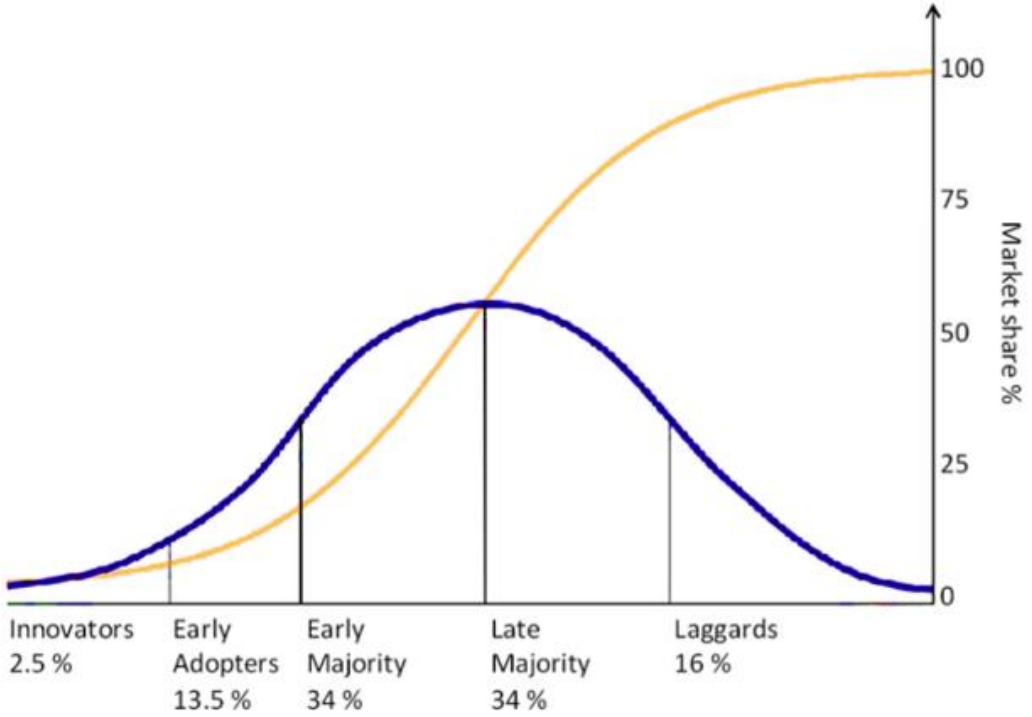
NATO. 2020. 'AAP-06 Edition 2020: NATO Glossary of Terms and Definitions'. NATO Standardization Office.

Acceptance – Operator attitude towards an autonomous system



According to Davis and Venkatesh, 1996

Adoption – Operator fully utilizes and embraces an autonomous system



According to Rogers, 2003

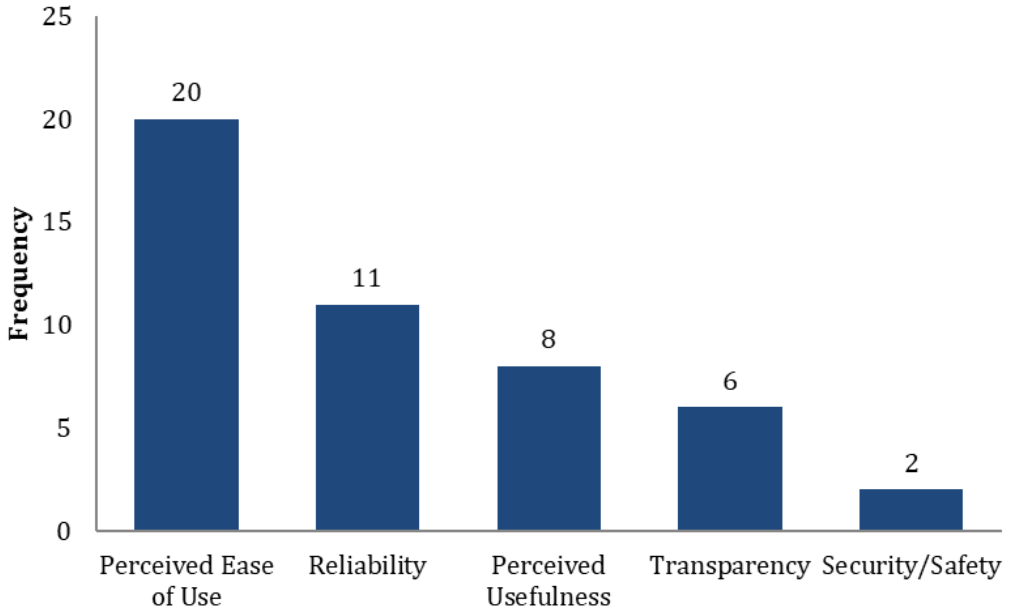
Purpose of our Research

To identify challenges concerning the acceptance and adoption of mission critical autonomous systems in the DOD including warfighters by using human factors and engineering approaches.

Challenges to the Acceptance and Adoption of Autonomous Systems

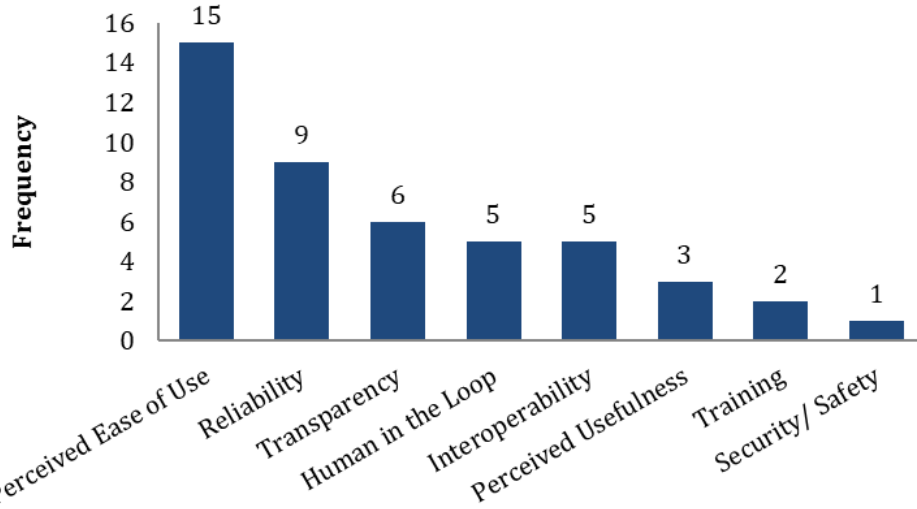
Factors Essential for the Acceptance and Adoption of Autonomous Systems (AS)

- Military branches align on what factors are essential to the acceptance and adoption of AS
- Perceived Ease of Use: Most essential factor for system design to support Human-Autonomy Teaming



Factors Essential for Future Autonomous System (AS) Design

- System Reliability: Most impact on operator reliance and trust in AS – can lead to complete rejection
- Potential disconnect between end-users and designers for military AS
  - Only 29% had been consulted during R&D phase of AS for military use
  - 93% indicated necessity to include end-user in consultation during R&D
- AS in military: mundane tasks, big data analytics, tracking/ early warning systems, cyber areas, logistics, UAS



Discussion

- Top essential factors to guide engineers and designers in the development/ presentation of autonomous systems for mission critical environments.
- Reduction in costs associated with scrapped systems or major system upgrades required to convince users to accept and adopt autonomous systems.
- Informs ongoing work on zero-trust systems engineering to produce more reliable and trustworthy autonomous systems.

QUESTIONS?

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