

Rethinking Hybrid Intelligence from a Team Perspective



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Why Hybrid Intelligence from a Team Perspective?

Human-AI Teams	Hybrid Intelligence systems
1+ humans and 1+ AI	1+ humans and 1+ AI
Focus: human-AI collaboration	Focus: integration of human and artificial intelligence
Unique members and roles	Human-AI complementary skills
AI agency, inspired by human teams	AI agency not strictly required
Team members have shared goal	Humans and AI have shared goal
Collaboration and teamwork	Collaboration
Complementary team performance	Achieve goals unreachable by either humans or machines alone

Team-oriented design approaches show that **hybrid teams outperform both agents taken alone or fully automated solutions.**

Team perspective highlights requirements of **ethical, responsible, trustworthy and socially acceptable AI in human-centered environments.**

Team perspective promotes research on ethical, responsible and explainable HI systems, **beyond technology-centric AI research.**

Assessing team perspective for Hybrid Intelligence

Results from the application of the (human-)Team Diagnostic Survey (TDS) to hybrid human-AI teams

Category	Feature of effective (human) team (from TDS)	Is important for HI	Is well understood for H-AI teams	H-AI teams with average score		
				>=3	>=3.5	>=4
Essentials	Real Team - Bounded	5 (100%)	Yes	H-Robot, H-Netflix, H-Elicit		
	Real Team - Stable	4 (80%)	Yes	H-Netflix, H-Elicit	H-Elicit	
	Real Team - Interdependent	5 (100%)	Yes			
	Compelling Direction - Clear	5 (100%)	Yes	H-Robot, H-Elicit	H-Robot	H-Robot
	Compelling Direction - Challenging	4 (80%)	No	H-Robot, H-Netflix, H-Elicit		
	Compelling Direction - Consequential	5 (100%)	Yes	H-Netflix, H-Elicit	H-Netflix	
	Right People - Diversity	5 (100%)	Yes	H-Robot	H-Robot	
	Right People - Skills	4 (80%)	No	H-Netflix		
Enablers	Sound Structure - Whole Task	3 (60%)	No	H-Robot, H-Elicit	H-Elicit	
	Sound Structure - Autonomy and judgment	5 (100%)	Yes	H-Robot, H-Elicit	H-Robot, H-Elicit	
	Sound Structure - Knowledge of results	4 (80%)	No			
	Sound Structure - Team Size	5 (100%)	Yes	H-Netflix, H-Elicit	H-Netflix, H-Elicit	H-Netflix, H-Elicit
	Sound Structure - Team Norms	5 (100%)	Yes	H-Robot, H-Elicit		
	Supportive Context - Rewards and recognition	3 (60%)	No			
	Supportive Context - Information	5 (100%)	No	H-Robot, H-Elicit	H-Robot	H-Robot
	Supportive Context - Education and consultation	4 (80%)	No	H-Robot, H-Elicit	H-Robot	
	Supportive Context - Material Resources	5 (100%)	No	H-Robot, H-Elicit	H-Robot	
	Coaching - Availability	3 (60%)	No	H-Robot		
Coaching - Helpfulness	3 (60%)	No				
Key Task Processes	Effort	3 (60%)	No	H-Robot		
	Strategy	5 (100%)	No	H-Robot		
	Knowledge and skills	5 (100%)	No	H-Elicit		

Table: A group of 5 HI experts evaluated 3 hybrid human-AI teams w.r.t. each feature (different group of participants for different Category). Teams concerning 3 domains: warehouse management (**Human-Robot** team), entertainment (**Human-Netflix**), and research assistance (**Human-Elicit**). Participants assigned a score of 3 or 4 to a team to indicate that the team reflected the feature moderately, or very well, respectively. A Yes in the *Is well understood for H-AI teams* column indicates that no participant reported difficulties in understanding the feature.

Importance of measures of effectiveness of human teams for measuring effectiveness of HI systems (15 participants)



Current and Future Work

- What is HI and how to measure it? Towards a unified vision on Hybrid Intelligence.
- Requirements and guidelines for designing and evaluating Hybrid Intelligence systems.
- Assessment of the level of Hybrid Intelligence of solutions from consortium members, and of existing HI systems.