

Sharing awareness and problem solving: introducing the concepts of embodied knowledge, epistemic and pragmatic action...

Track 4: Cognitive and social issues

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Ideas developed in this communication
do neither commit
the French ministry of Defense
nor the French Air force



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Various concepts...

- Situation awareness is coined by Mica Endsley as the combination of a perception of elements in the current situation environment and of a perception of the future status of the situation.
- **Situation awareness remains an equivalent to situation assessment...**
- Fiore and Salas explain that situation “assessment” is the term used to describe the processes (e.g. attention, pattern recognition, communication) engaged to concretize the end product of a situation “awareness”.



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Contents...

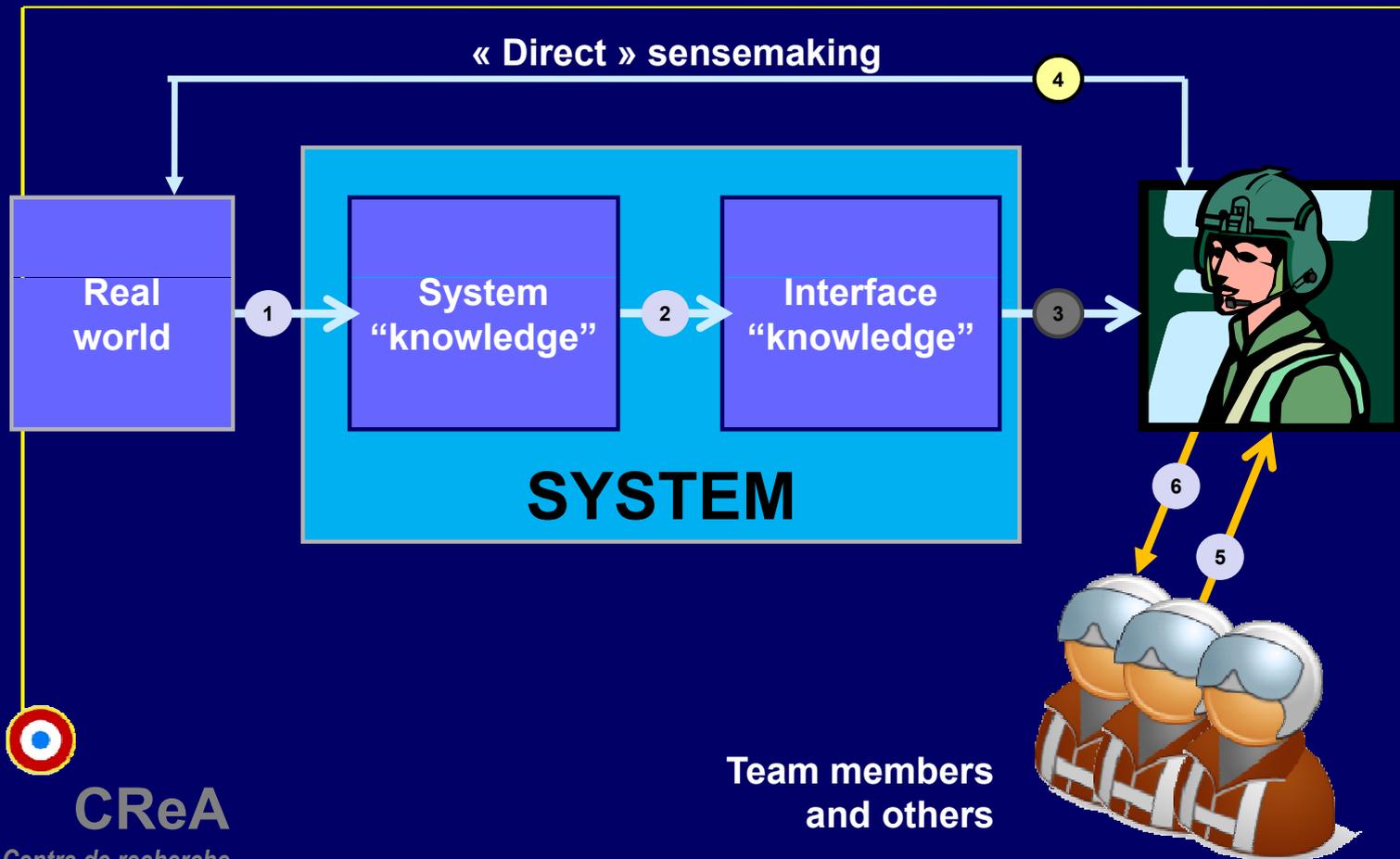
- Against the mechanist view of Situation awareness (SA)
- Introducing the concept of embodied knowledge and team coordination to refine the SA concept into Situational awareness



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Mechanist view on SA processes



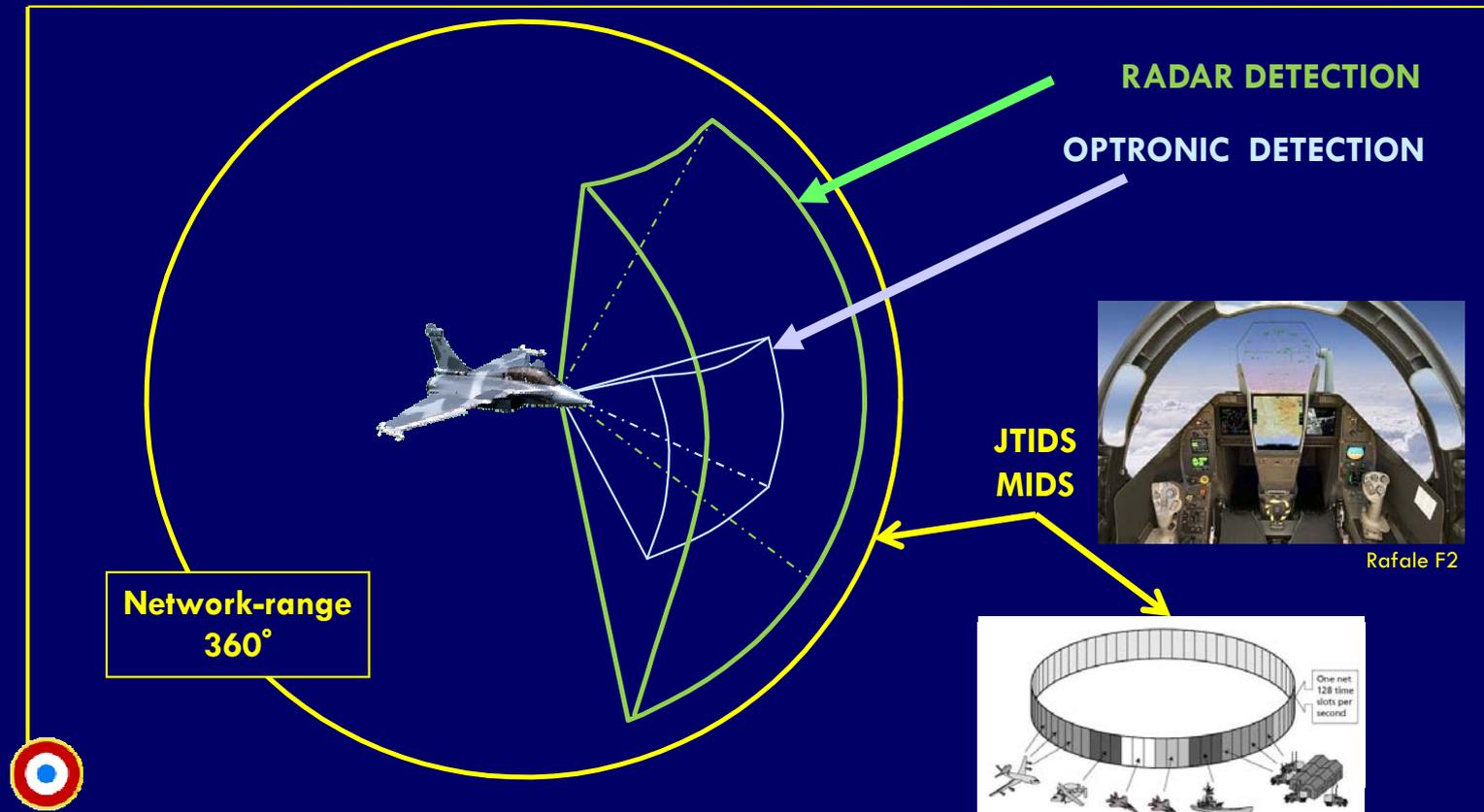
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Team members
and others

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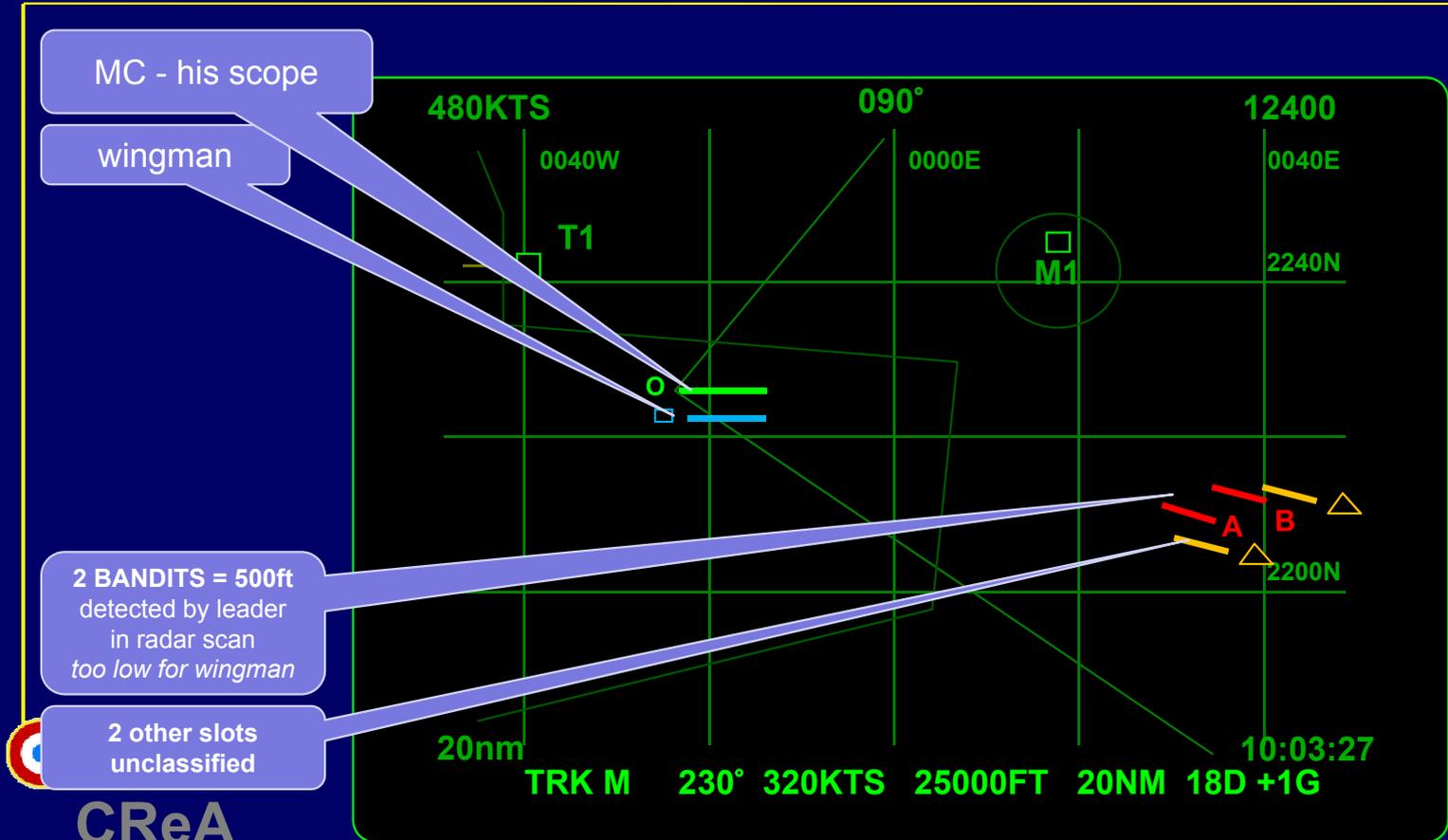
Network enabled SA



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Leader's SA - onboard sensors only



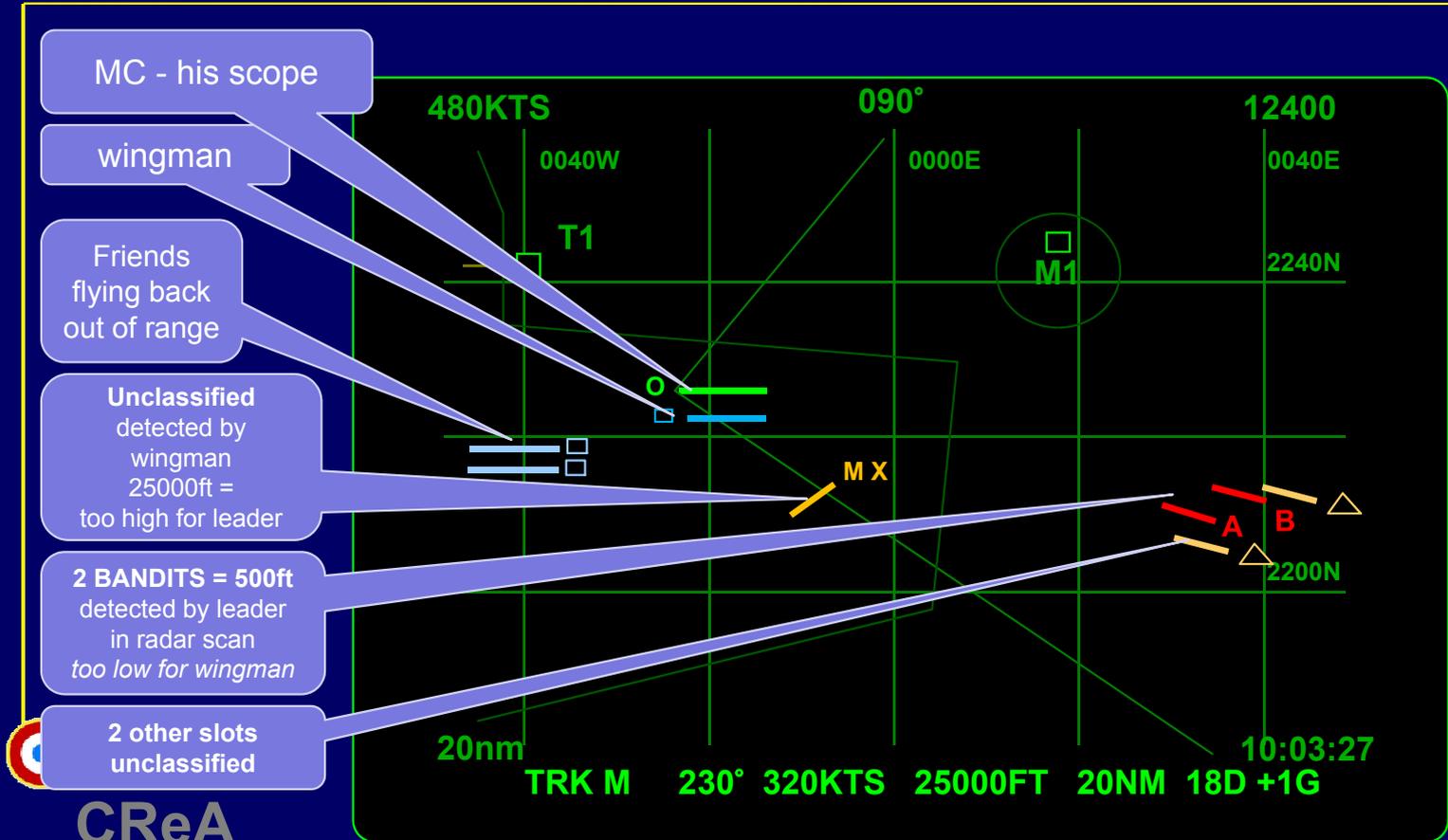
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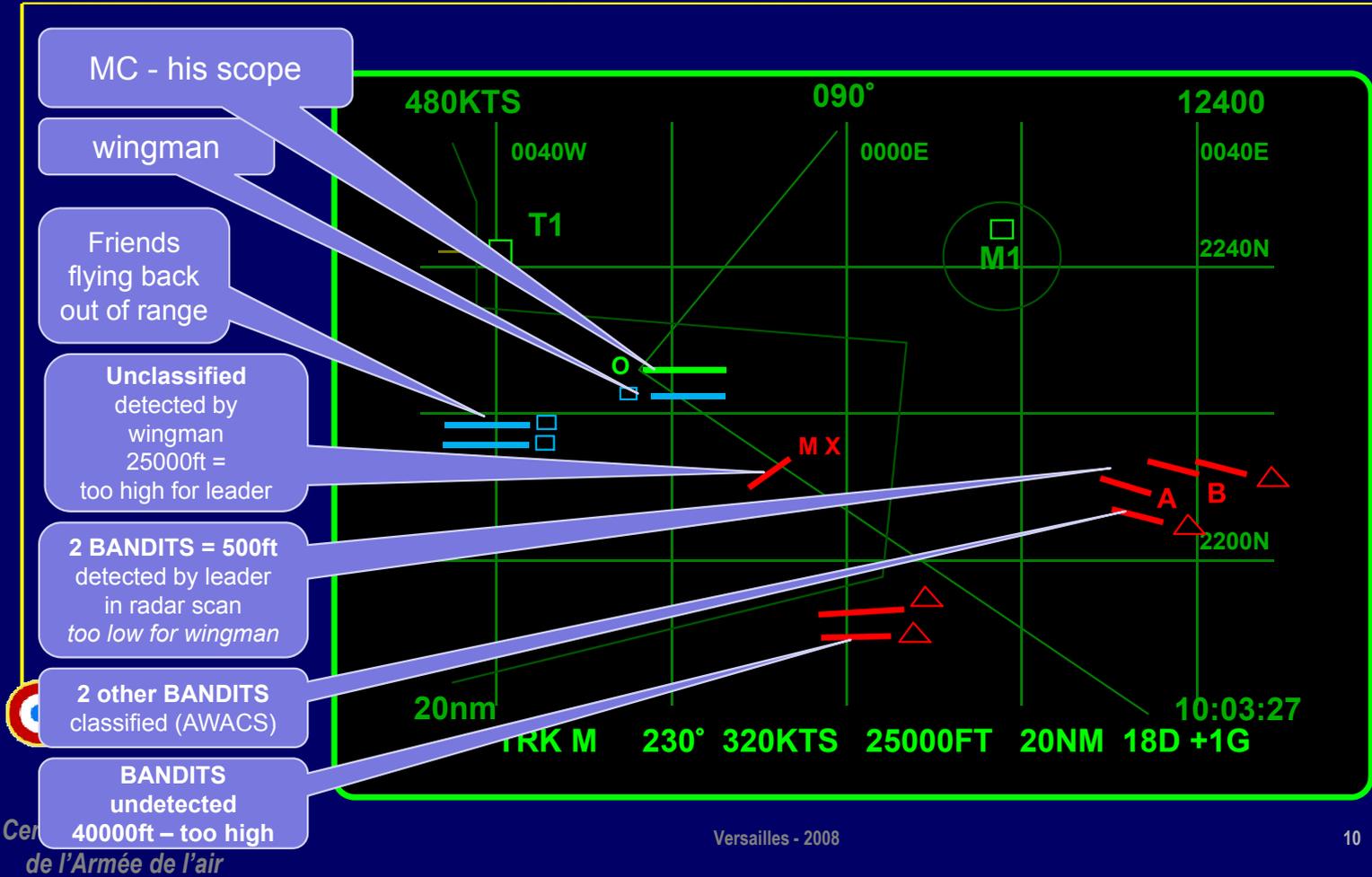
Leader + wingman's SA without JTIDS



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Network enabled SA : SA with JTIDS



SA and understanding...



Common
understanding

Requires the same vision of the external world (tactical situation) for all contributors to an operation

Mutual
understanding

Requires **together consistent** visions of the external world (tactical situation) to an operation

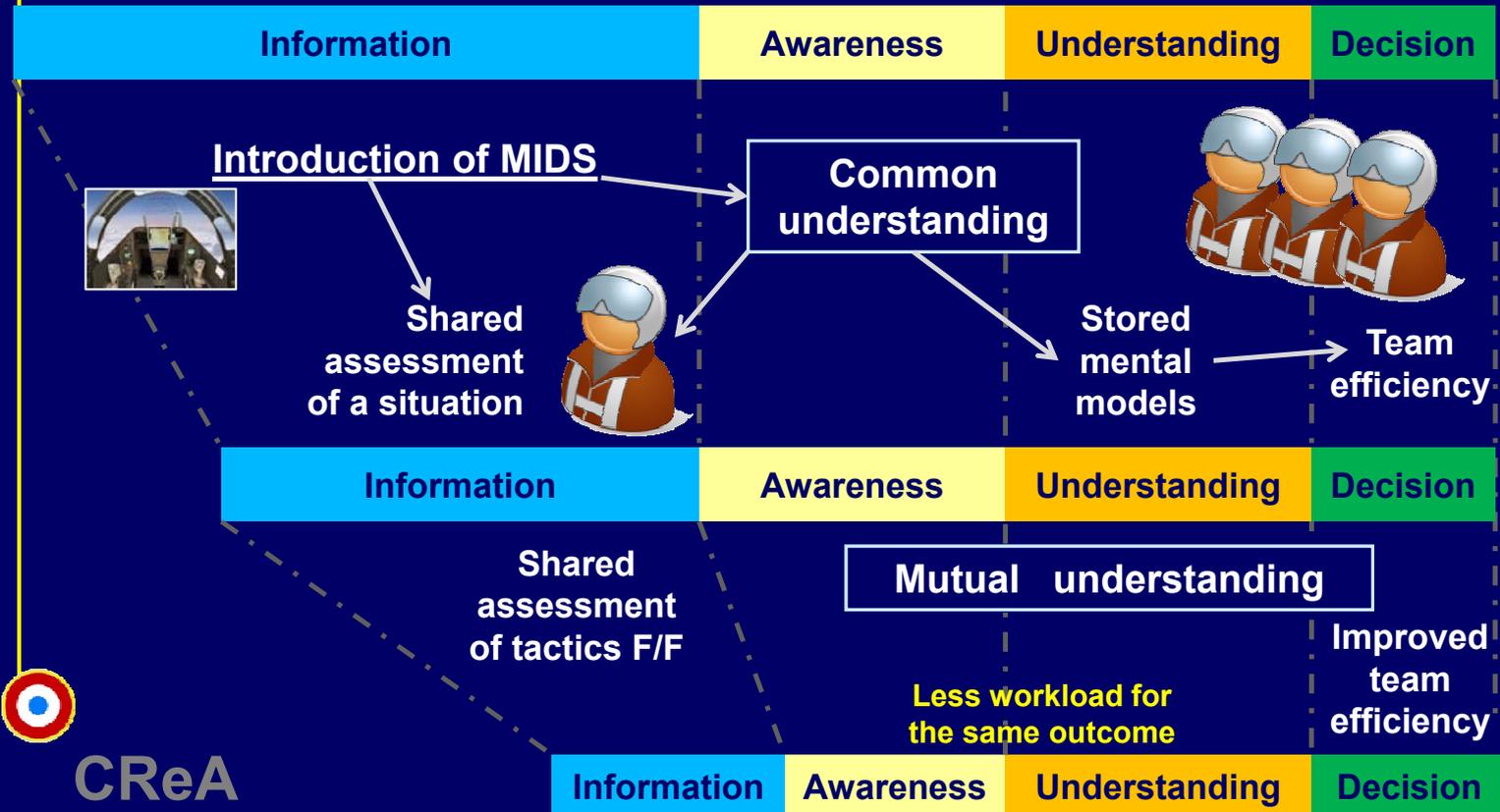


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Understanding and team building

Individual cognitive workload...



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Team efficiency...

At the level of the team led by a Mission commander, it becomes therefore possible to considerate...

- The relevance of a new repartition for roles and functions (actually for virtual roles as well)
- The possibility of new tactics (e.g. “over the shoulder” tactics)
- The team’s agility
- The team’s plasticity



- In one word:

SUBSIDIARITY rules



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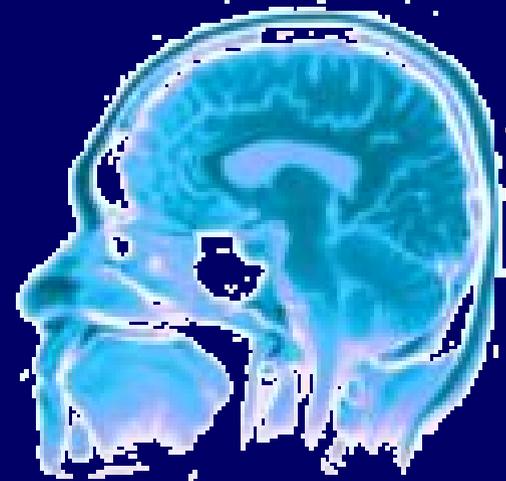
3 Forms of knowledge

K

Abstract
symbolic

Narrative

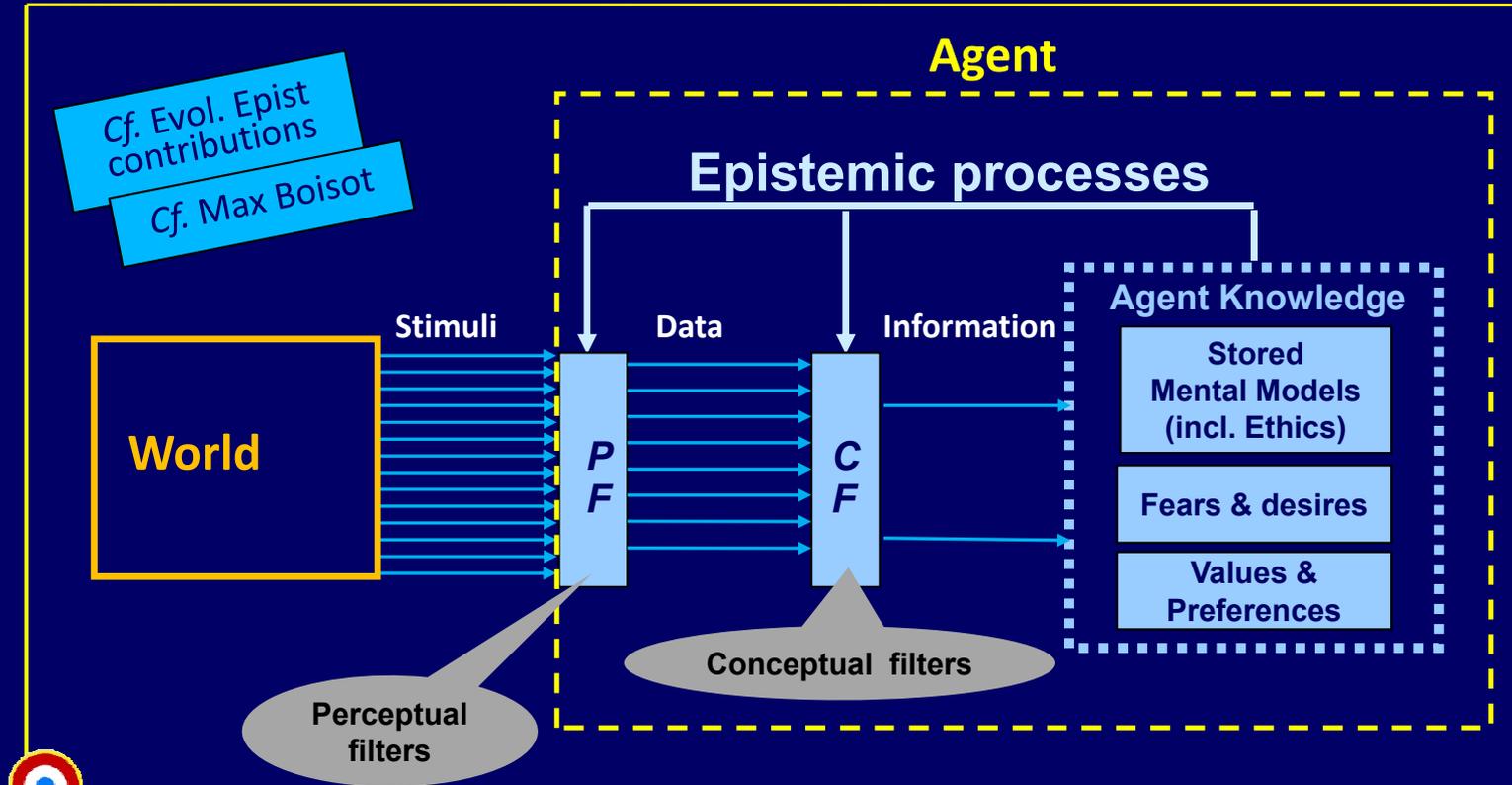
Embodied



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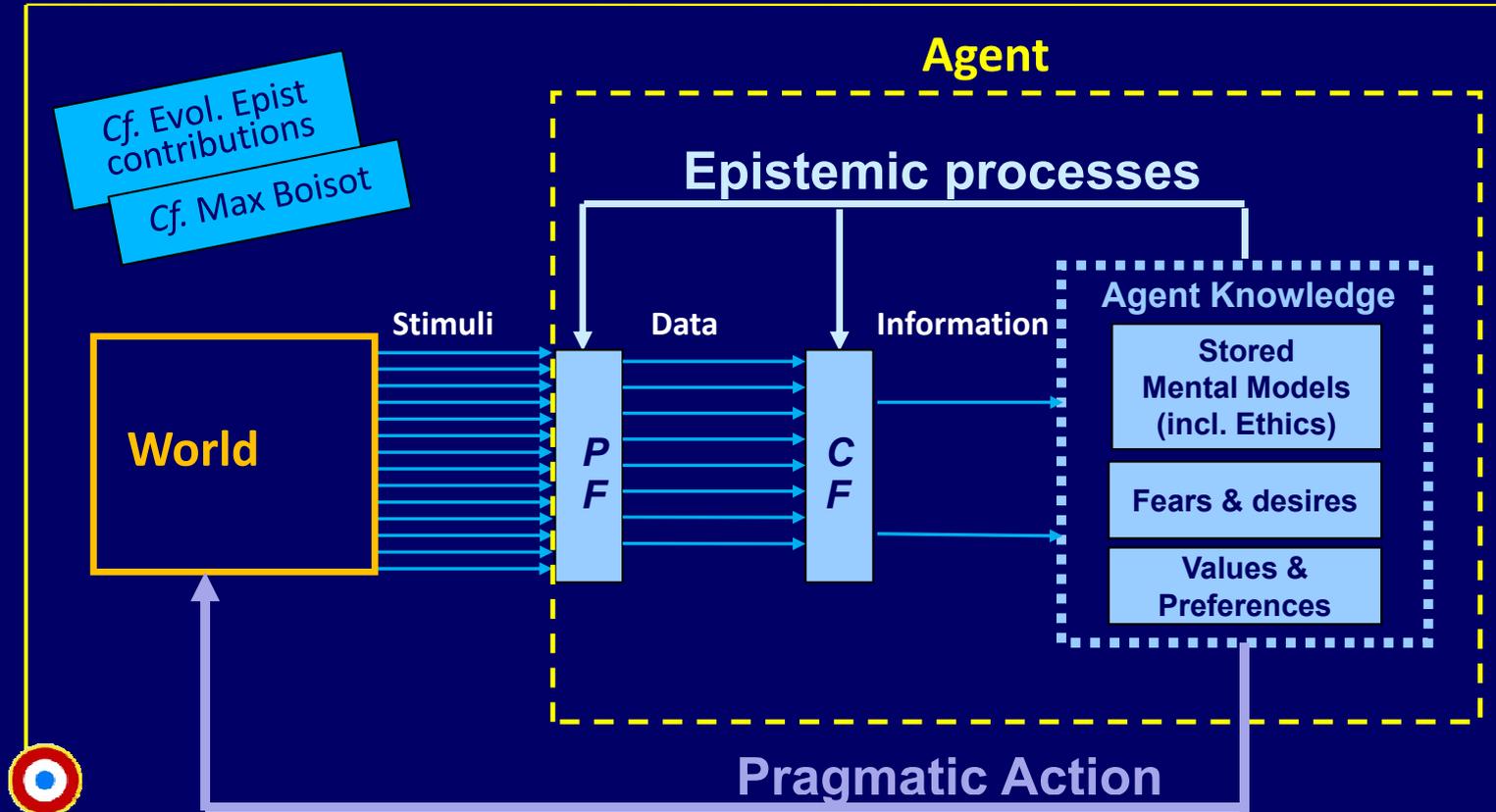
Cognitive process



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Cognitive process



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Redefining SA at the individual level

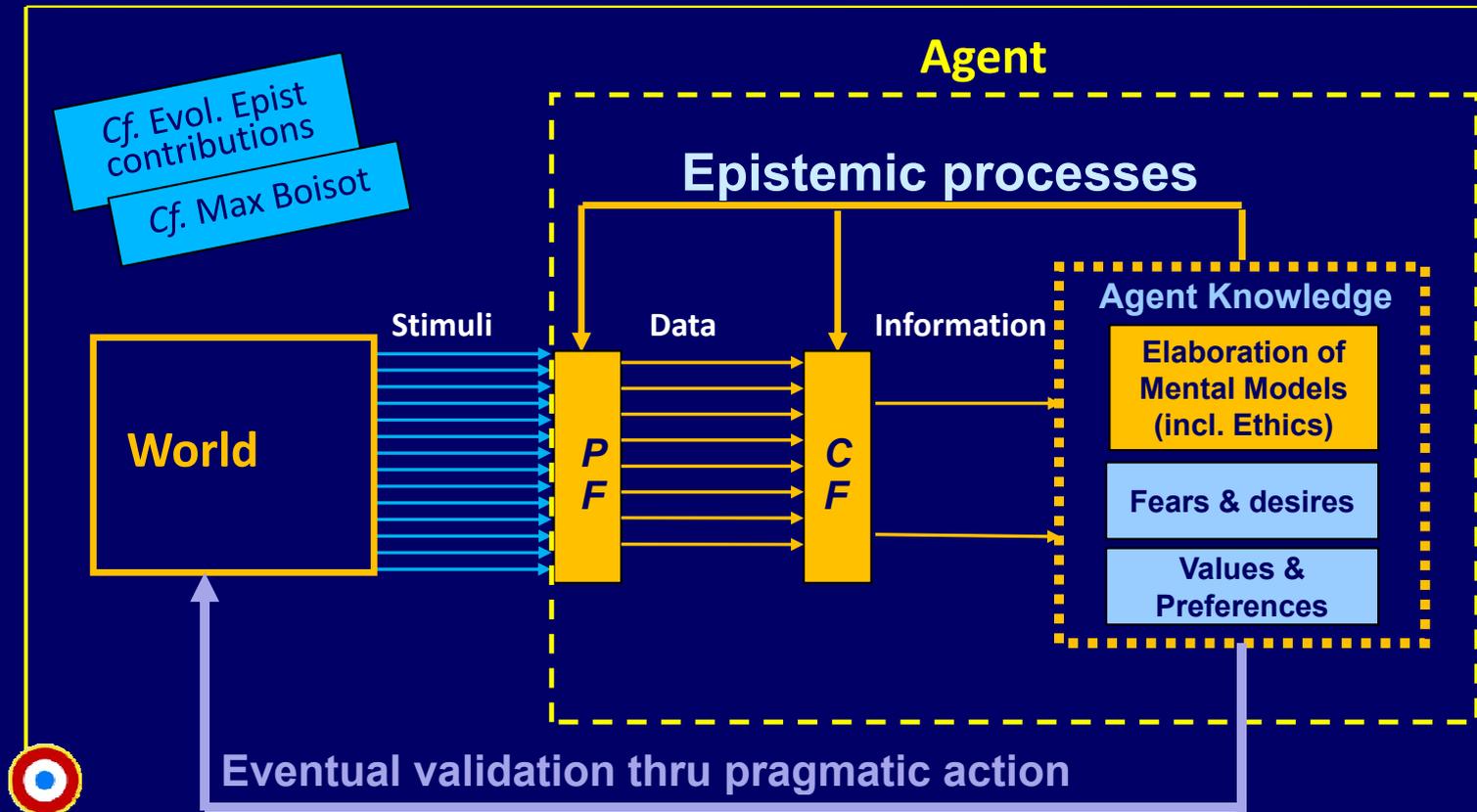
- Effective individual situational awareness could be thought of an error-correcting procedure for bringing the agent's knowledge box into alignment with the real-world
- Stimuli relevant for the reference to embodied knowledge emerge through the calibration of the individuals' perceptive filters.
- The individual knowledge process refers to the individual contribution to collective action
- Situational awareness relies to the assessment of shared references enacting team-based consistent actions.



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Cognitive process : K elaboration



Cf. Evol. Epist contributions
Cf. Max Boisot

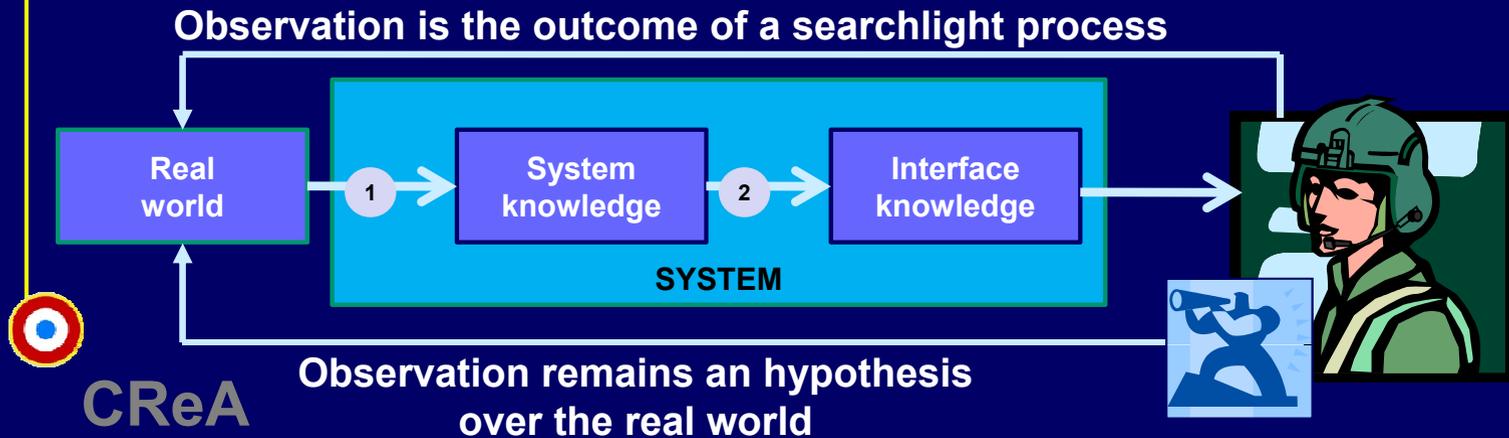


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Searchlight vs. bucket theory of K...

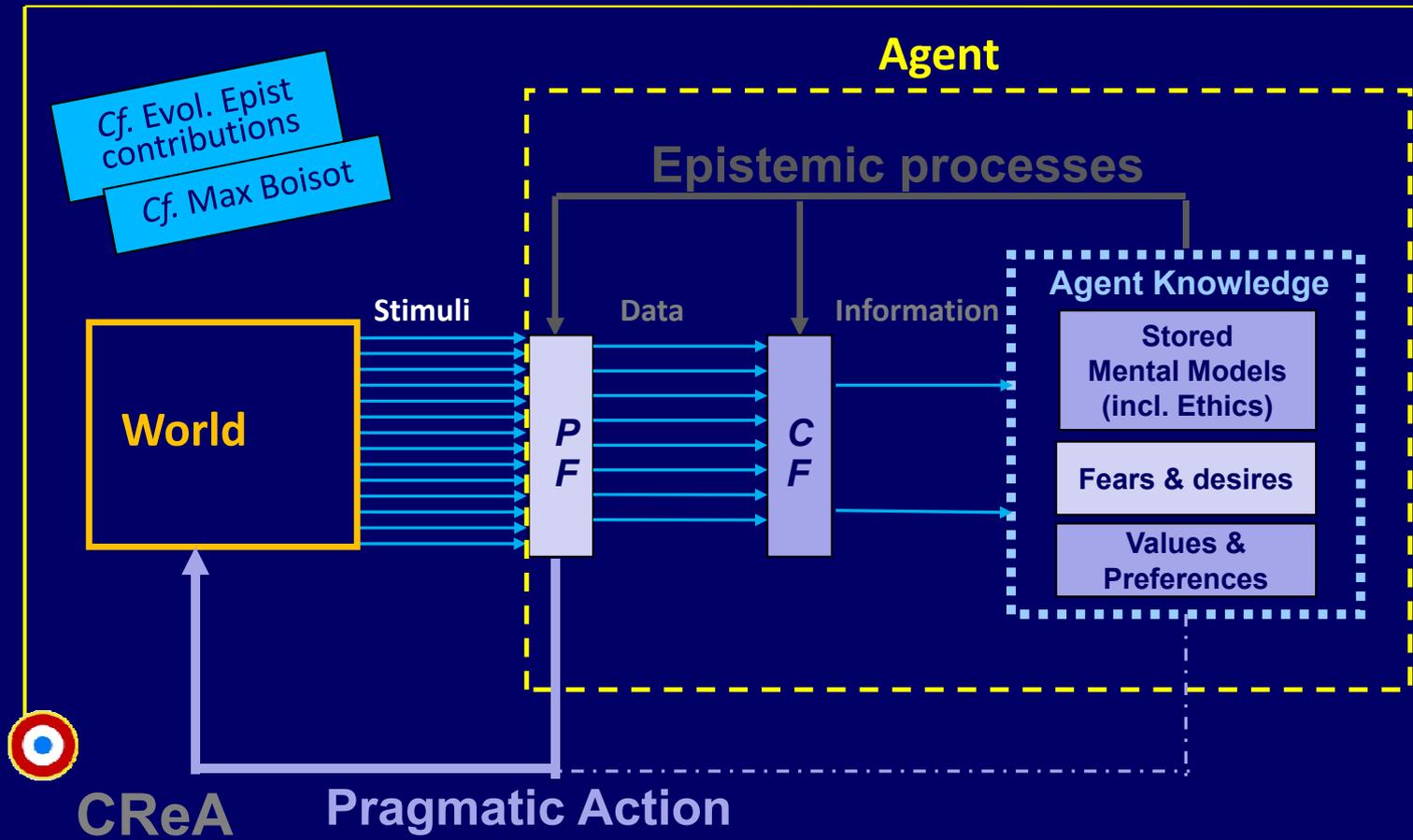
Stimuli emanating from the world only ever become data for an agent (ie, « given ») **when they register with him perceptually** – ie, after filtering.



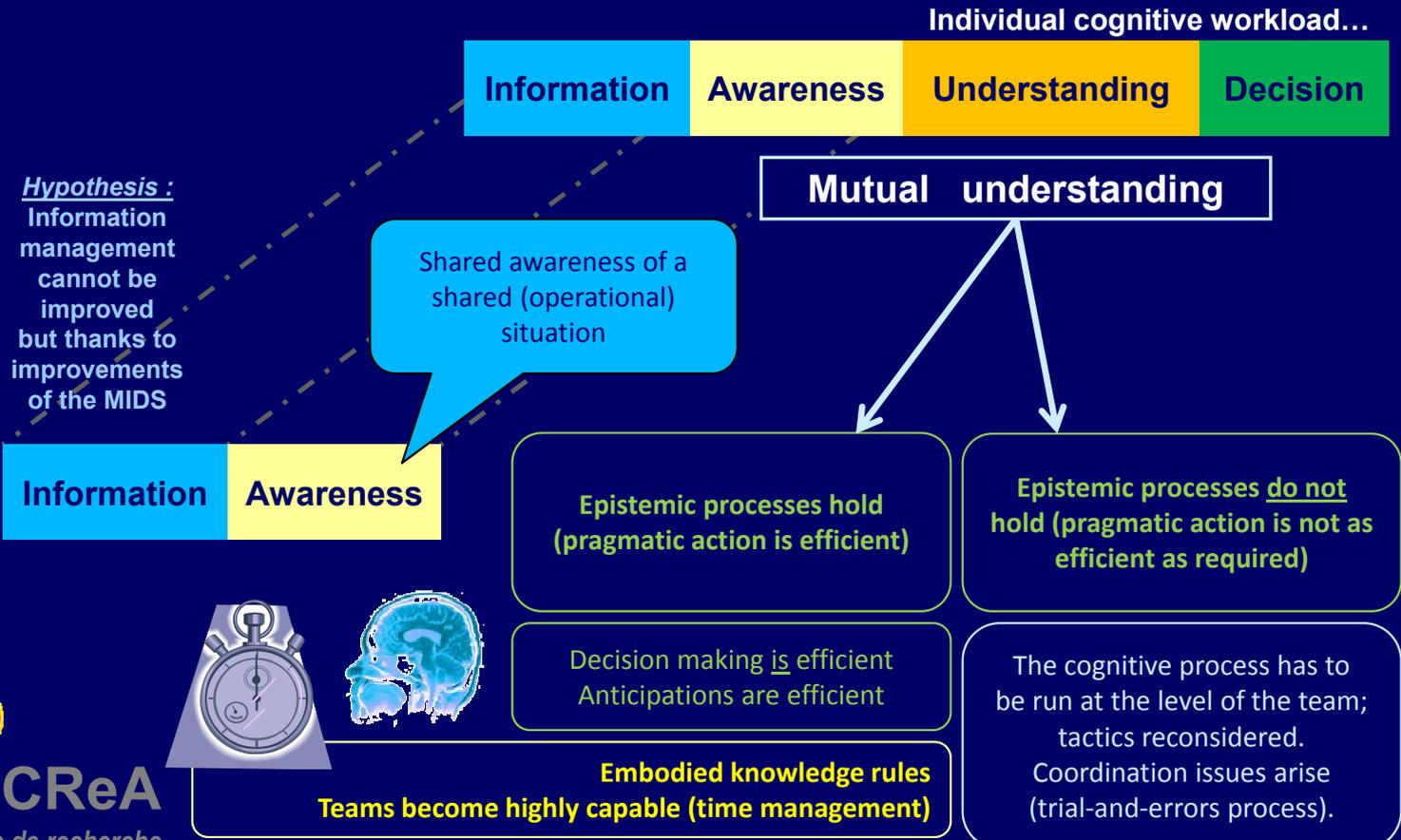
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Cognitive process : Embodied K



Understanding and team building



Hypothesis :
Information management cannot be improved but thanks to improvements of the MIDS



Enactment

- Agents enact their environment.
- SA is only a part of the enactment of the tactical / operational situation.
- **The agents, through judiciously chosen pragmatic action, aligns his representation of the World with the content of his knowledge box.**
- **Effective situational awareness should be thought of as an error-correcting procedure embodied both in the soldiers' brains and in (tactical) doctrine ruling as a coordination pattern.**



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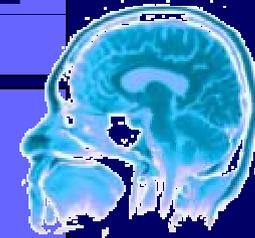
Conclusion...

LOGICAL
PROGRESSION

PROFESSIONAL EDUCATION



CALIBRATION OF PERCEPTIVE
AND CONCEPTUAL FILTERS



EDUCATION OF
EMBODIED KNOWLEDGE &
ABSTRACT / SYMBOLIQUE
KNOWLEDGE



MUTUAL UNDERSTANDING

SITUATIONAL AWARENESS
& TEAM EFFICIENCY



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