

The Orientation step of the OODA loop and Information Warfare

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Overview

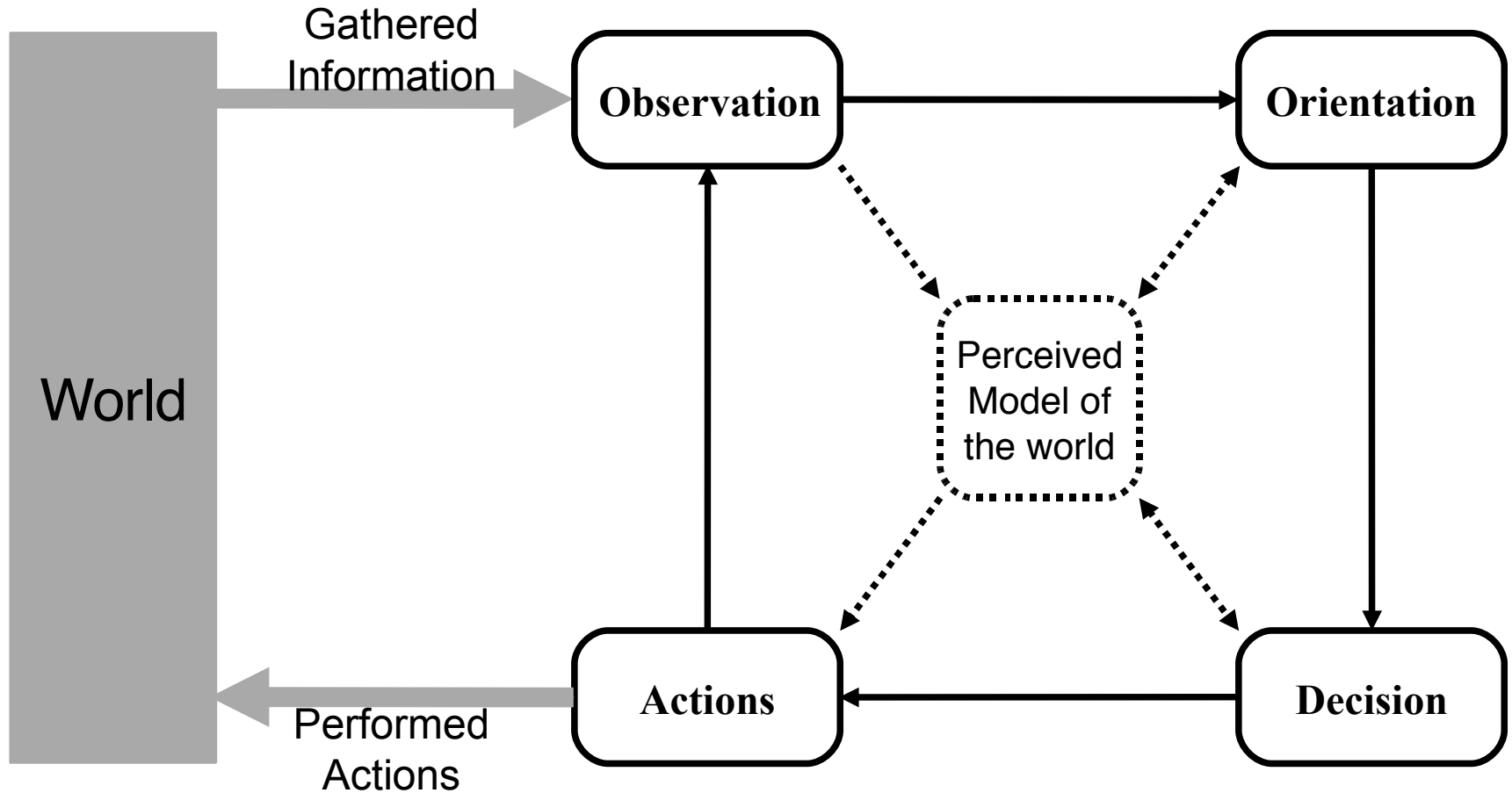
- Boyd's OODA loop model
- Expanded model of the Orientation step
- Information Warfare and Orientation
- Case studies of Deception and Self-deception

Boyd's OODA loop model



- Name originates from the loop's steps
 - Observation
 - Orientation
 - Decision
 - Action
- Describes the decision-making process of an individual or organisation
- Models a feedback loop between the decision-maker and their environment

Boyd's OODA loop model





Orientation step

Contains a method that combines

- New information
- Previous experience
- Cultural traditions
- Genetic heritage
- Analysis and synthesis methods

to produce an updated model of the world.

Orientation step

A decorative graphic at the top of the slide consists of two groups of three circles. The first group, on the left, has a solid light purple circle on the left, a white circle with a light purple outline in the middle, and a solid light purple circle on the right. The second group, on the right, has a solid light purple circle on the left, a white circle with a light purple outline in the middle, and a solid light purple circle on the right.

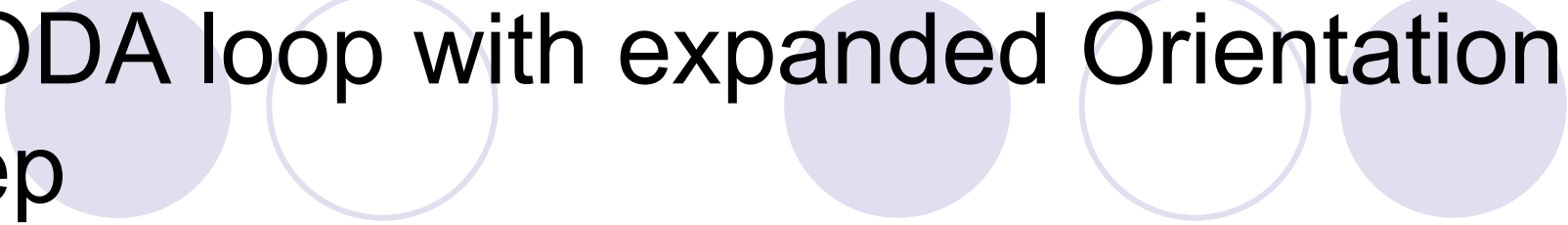
- However there is no description of how this process operates
- We now describe a model of the internal processes of the Orientation step



Proposed Orientation Step Actions

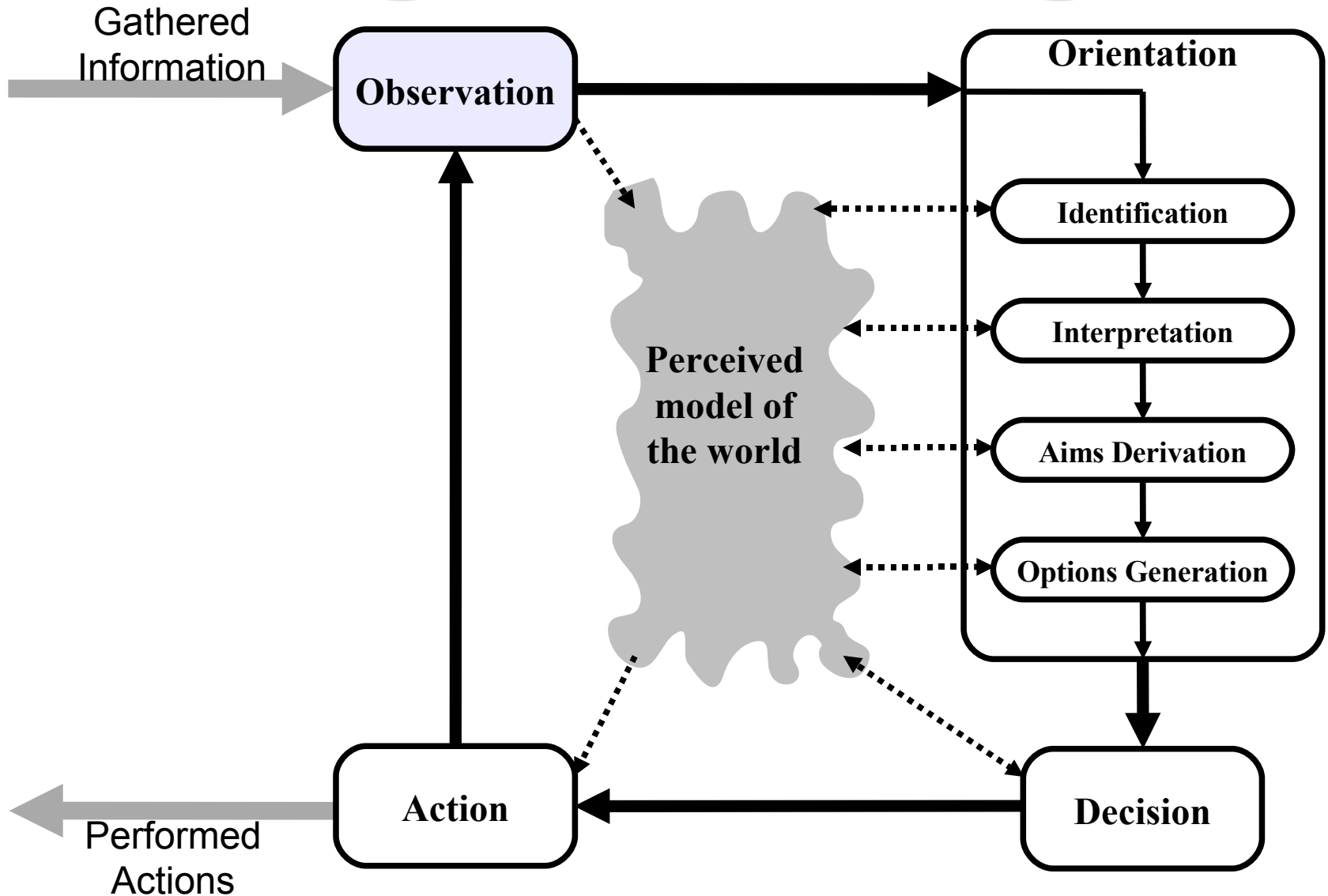
- Recognise known objects, events and relationships
- Analyse new information with known processing methods
- Evaluate the completion of aims and develop new aims
- Determine what actions may be performed how they will affect the world

OODA loop with expanded Orientation step

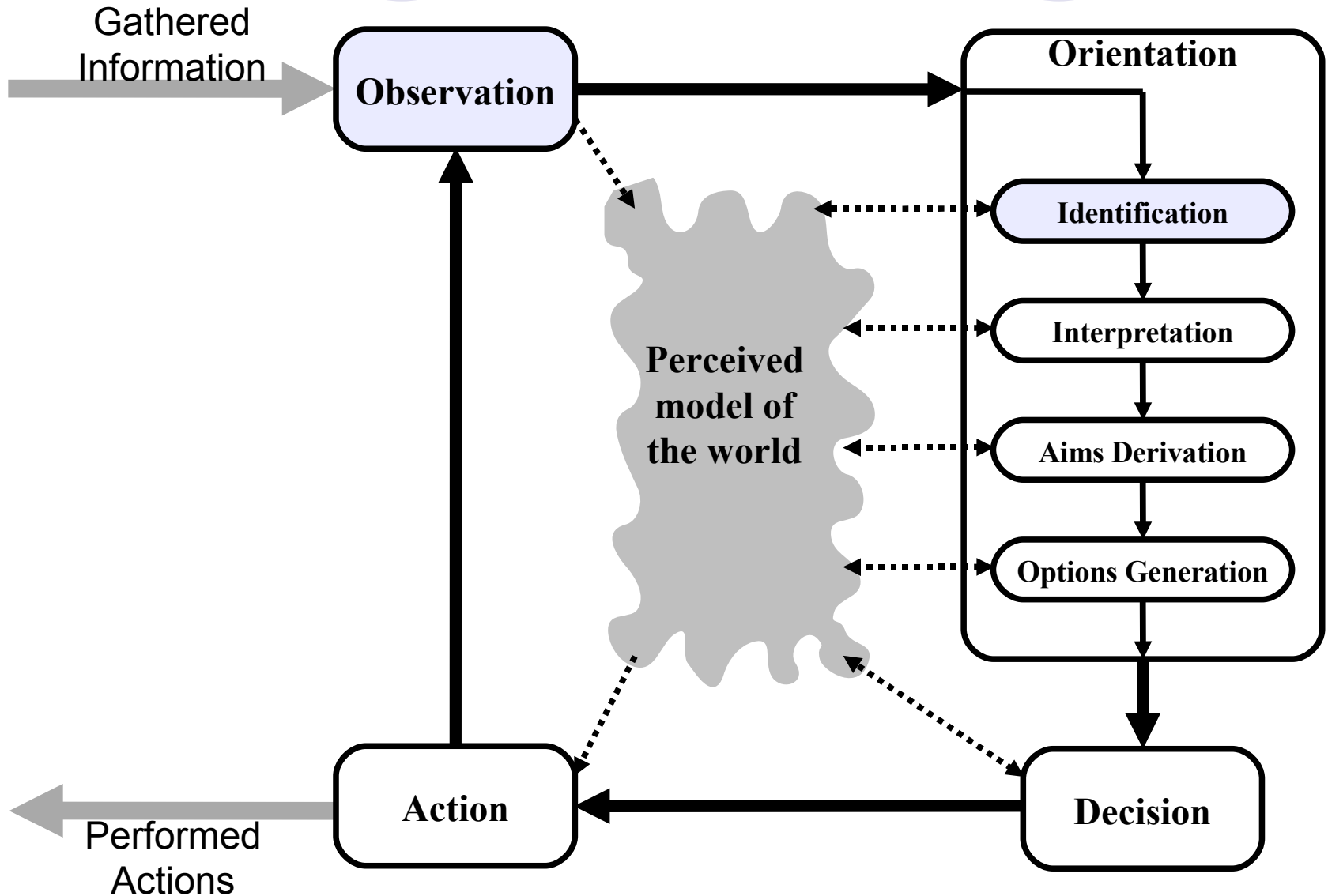


- Observation
- Orientation
 - Identification
 - Interpretation
 - Aims Derivation
 - Options Generation
- Decision
- Action

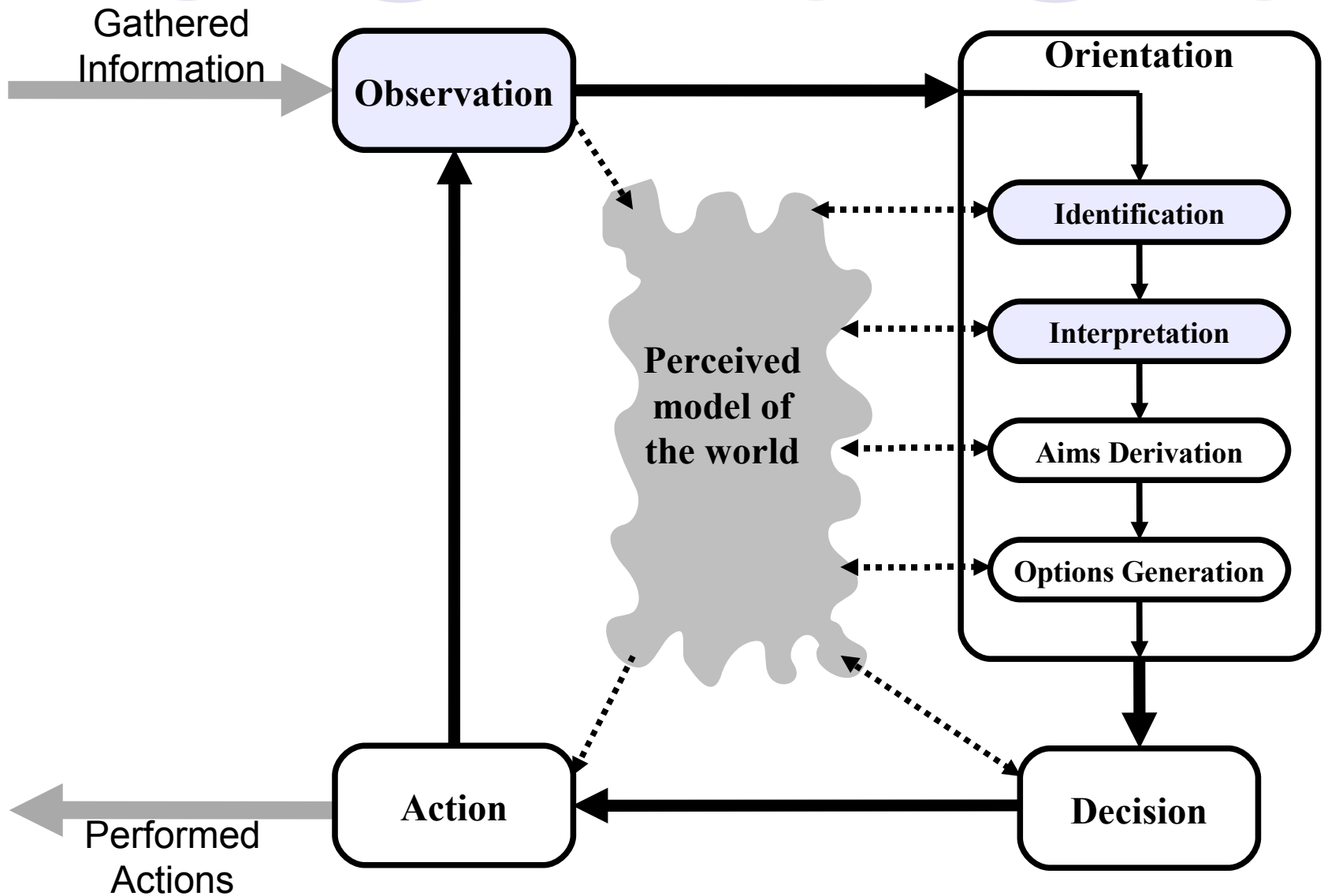
Expanded Orientation step



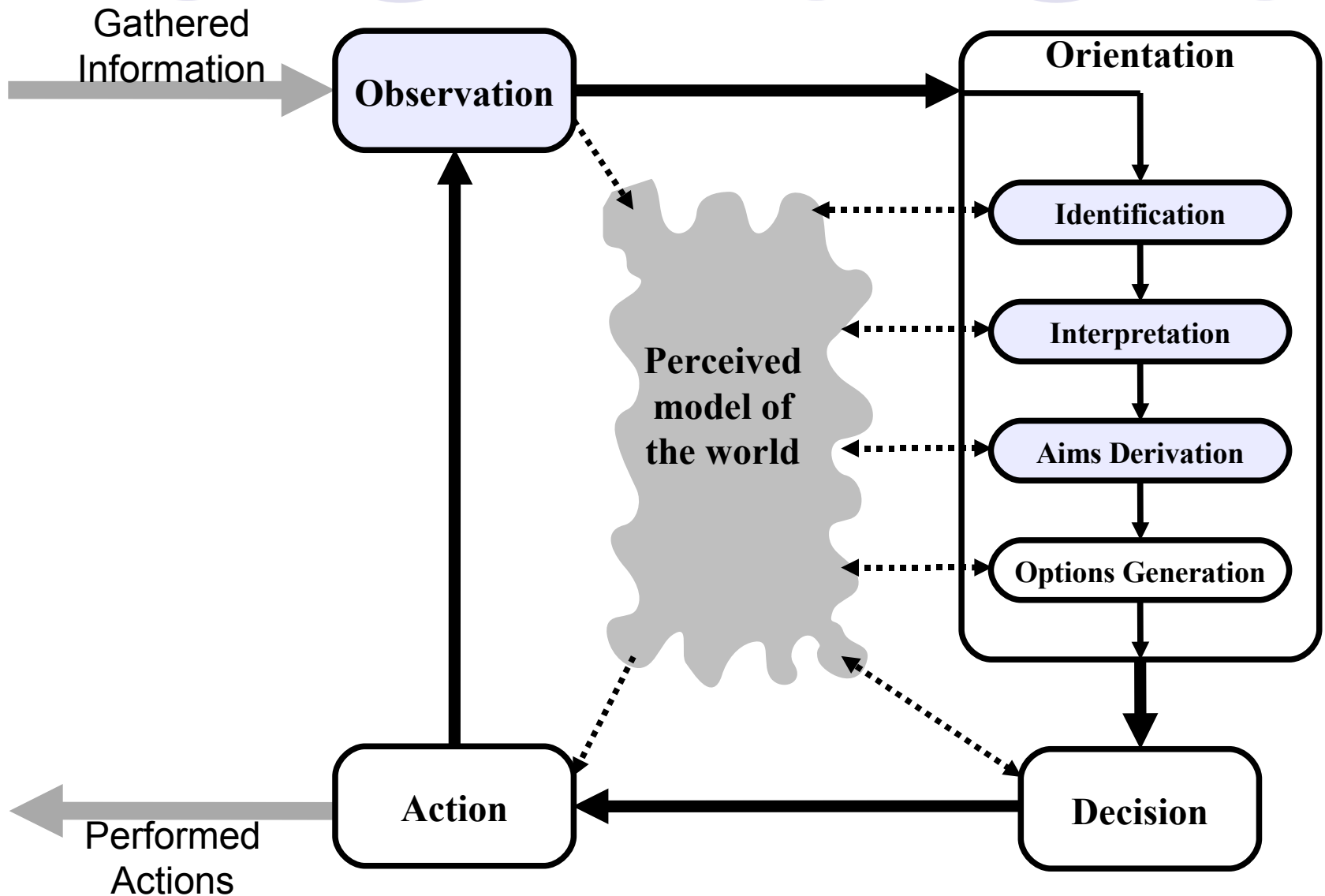
Expanded Orientation step



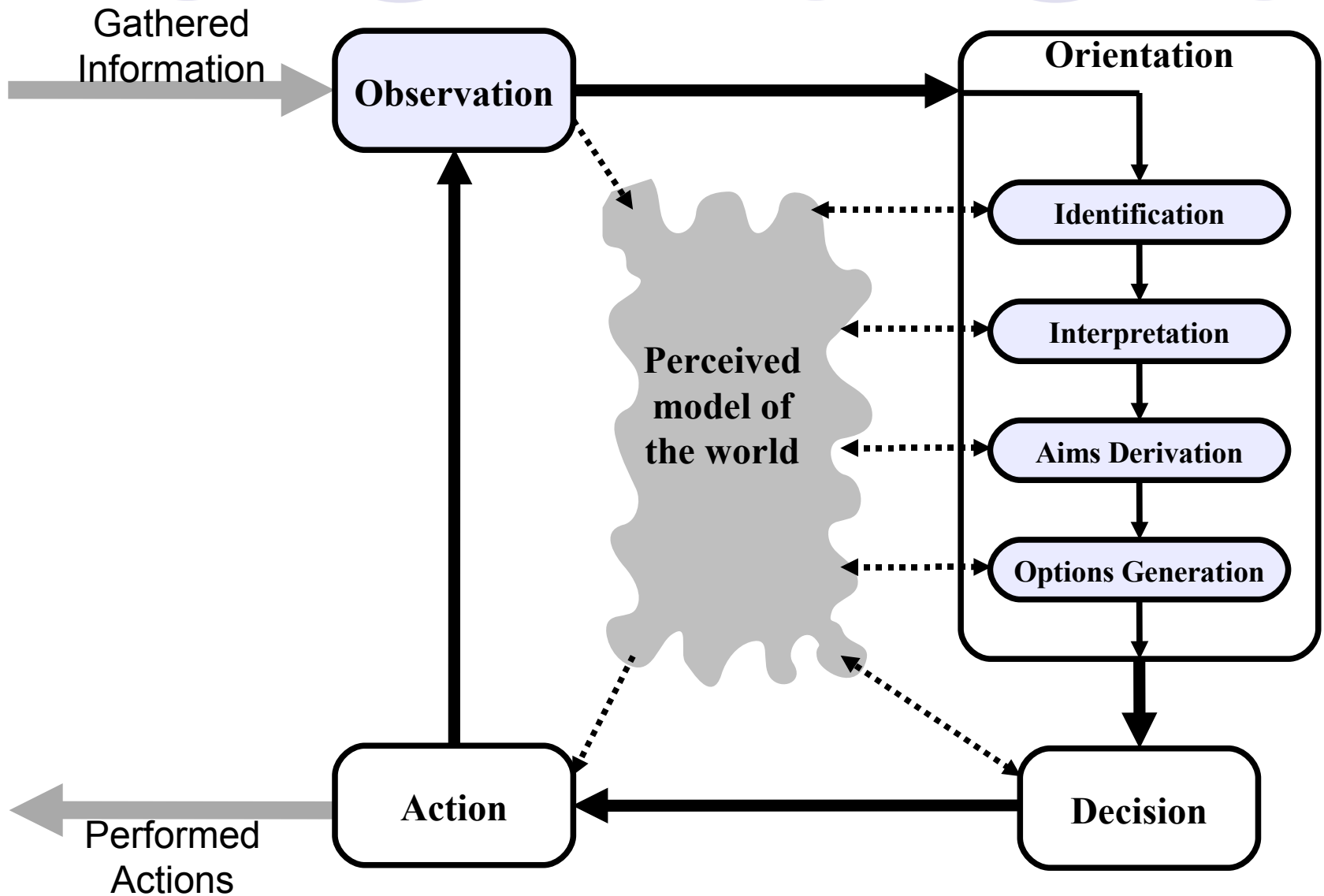
Expanded Orientation step



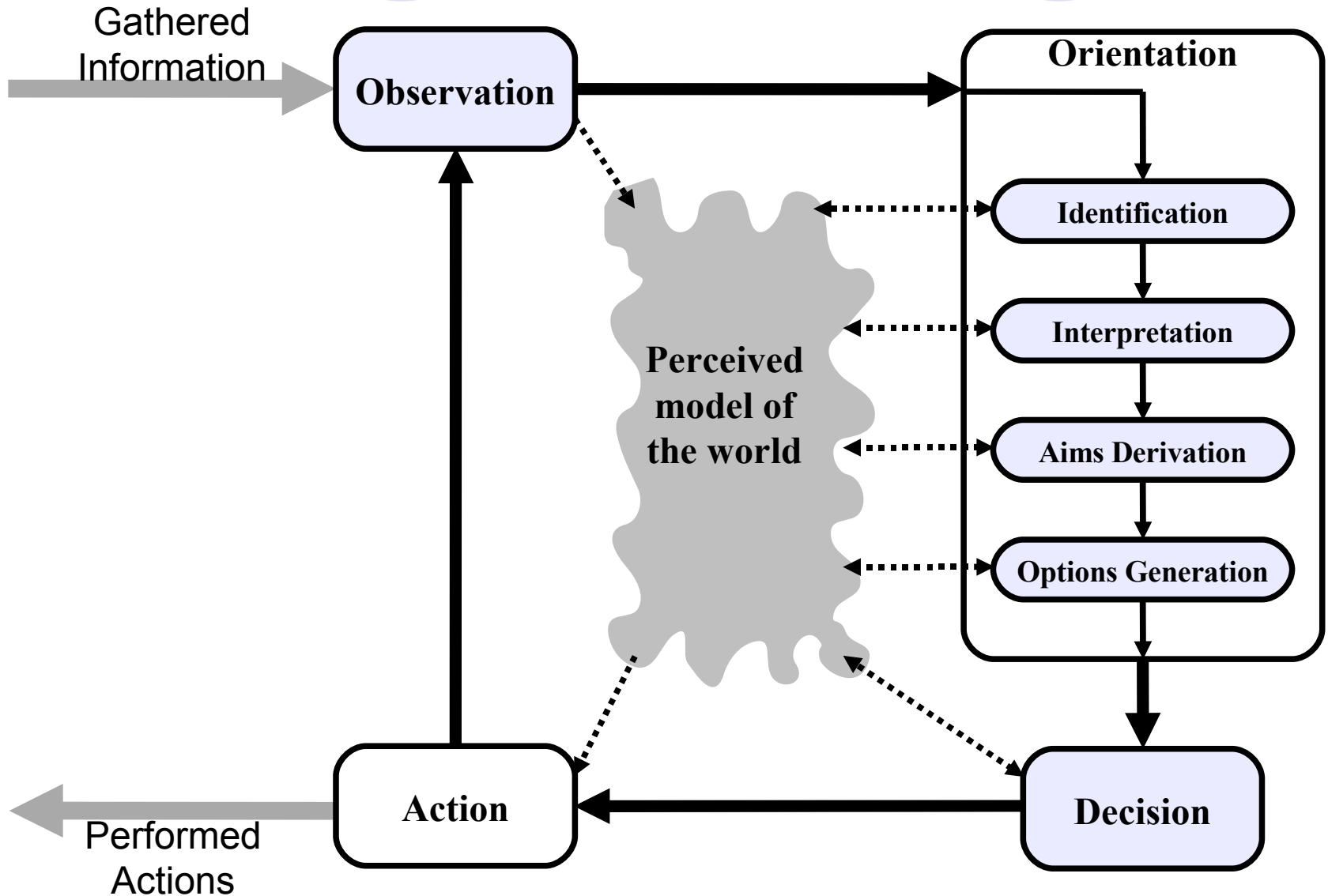
Expanded Orientation step



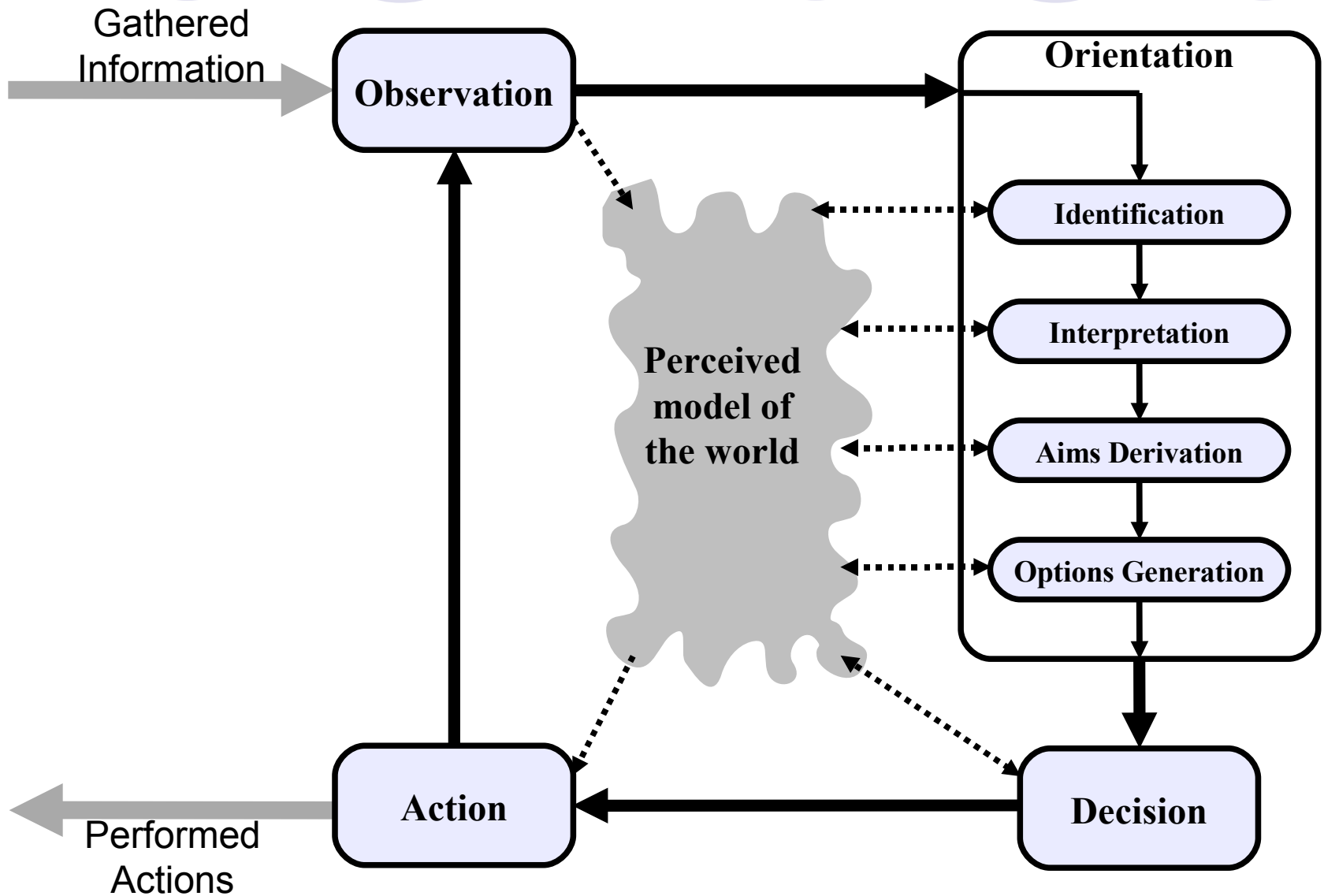
Expanded Orientation step



Expanded Orientation step



Expanded Orientation step





IW attacks that affect Orientation

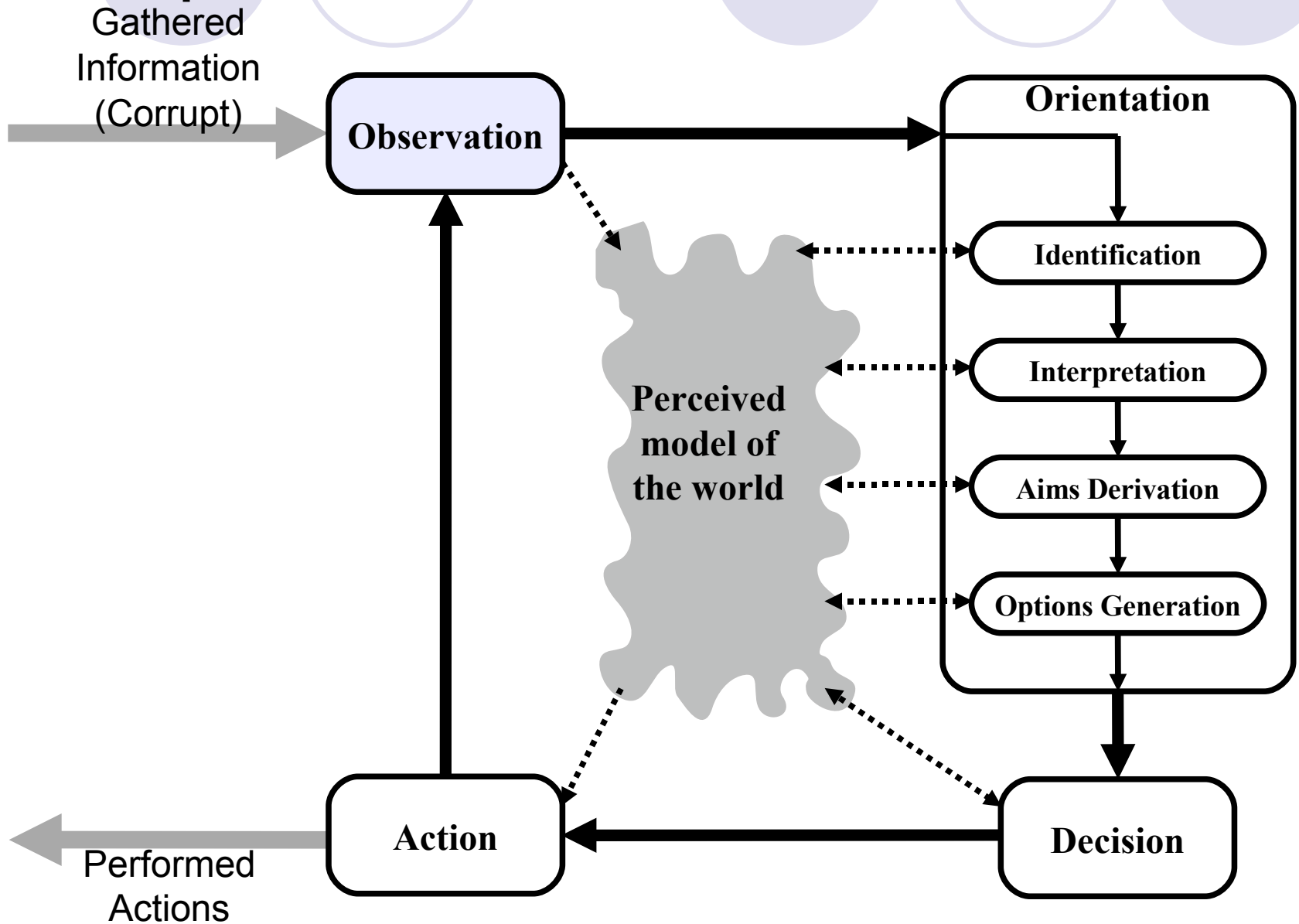
Deception

- Deception attacks provide false information that is accepted as true, before being used as input to decision-making

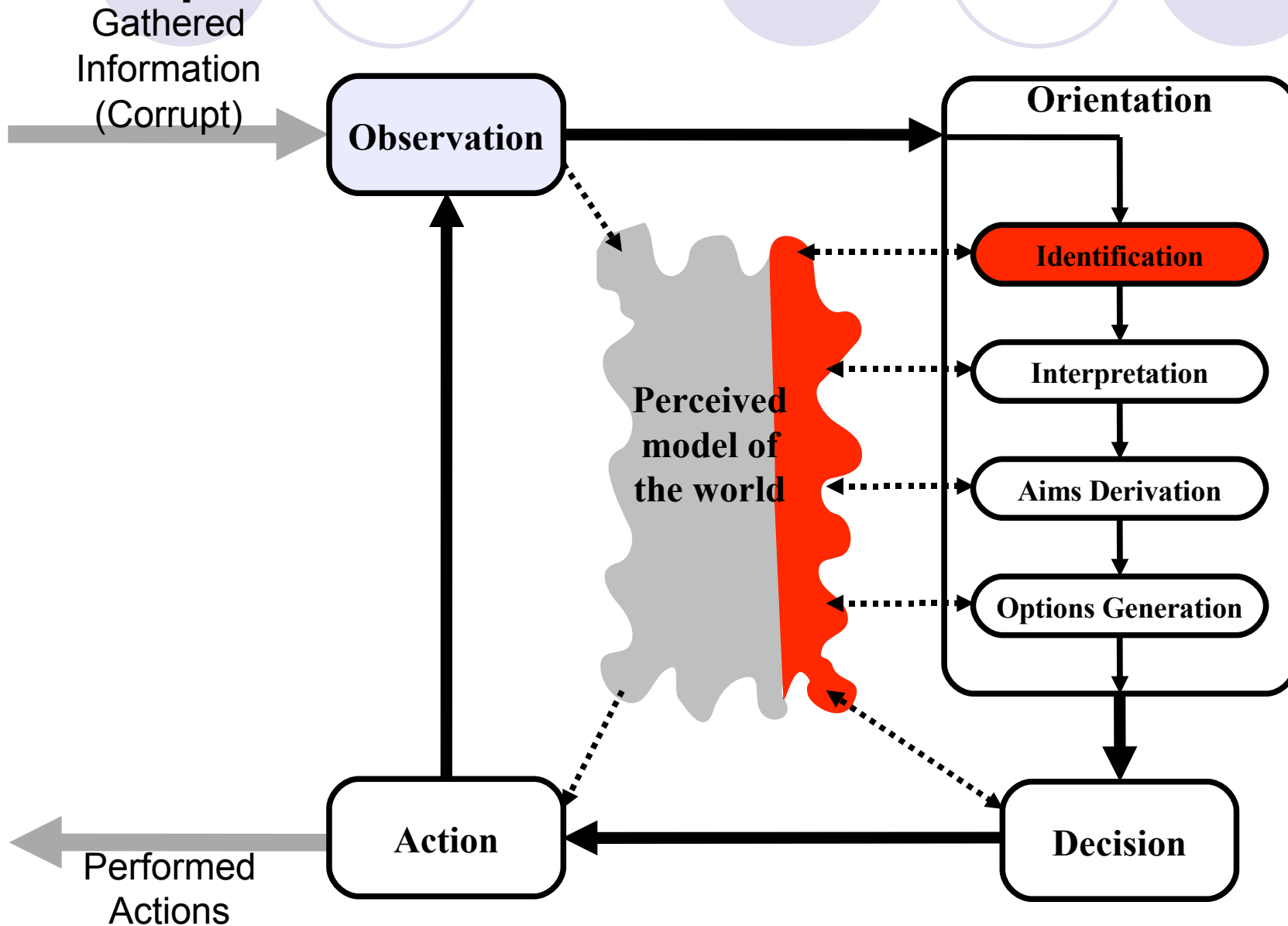
Self-deception

- Self-deception occurs when an individual believes something to be true, despite evidence that disproves it

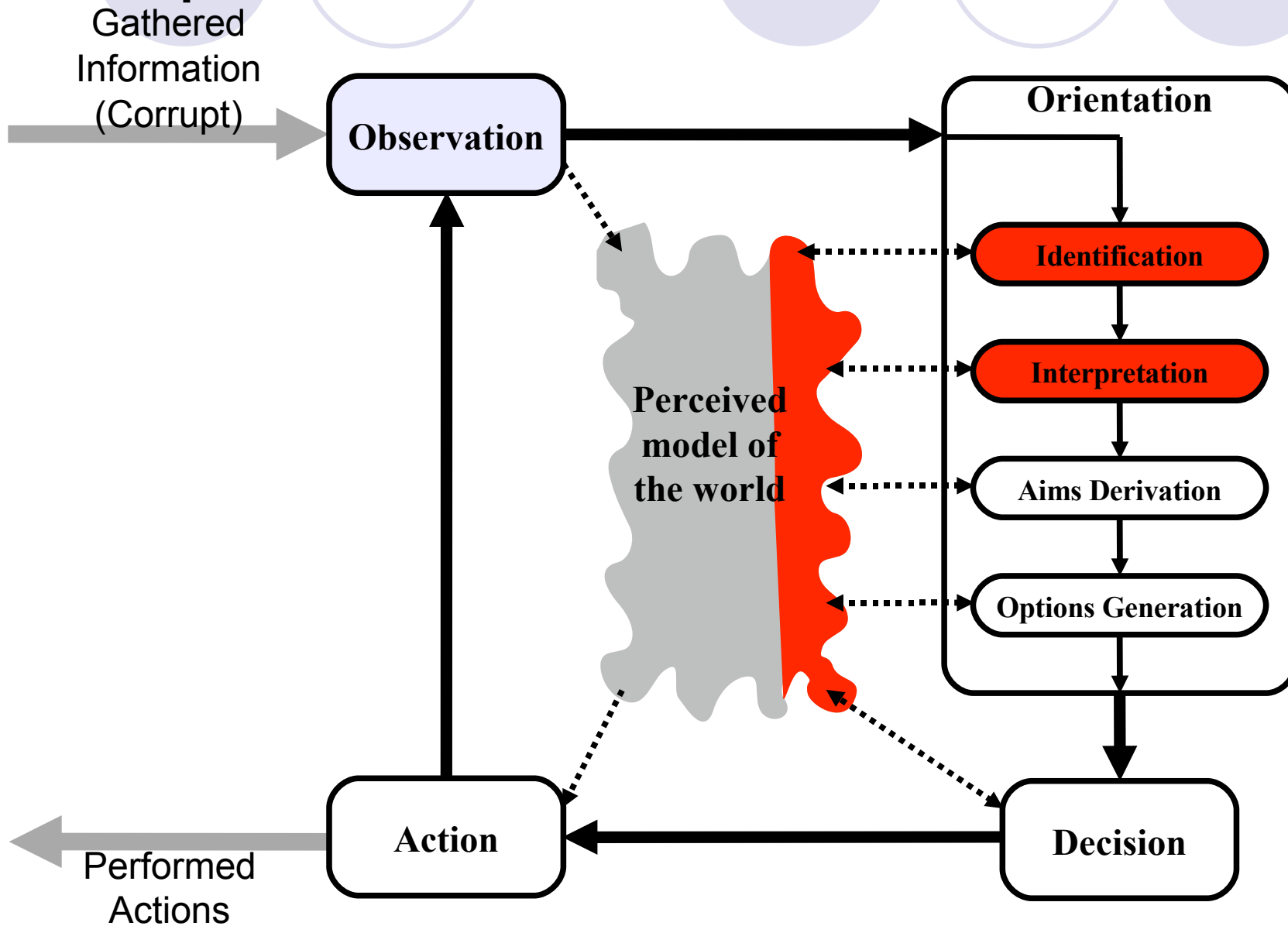
Deception Attack



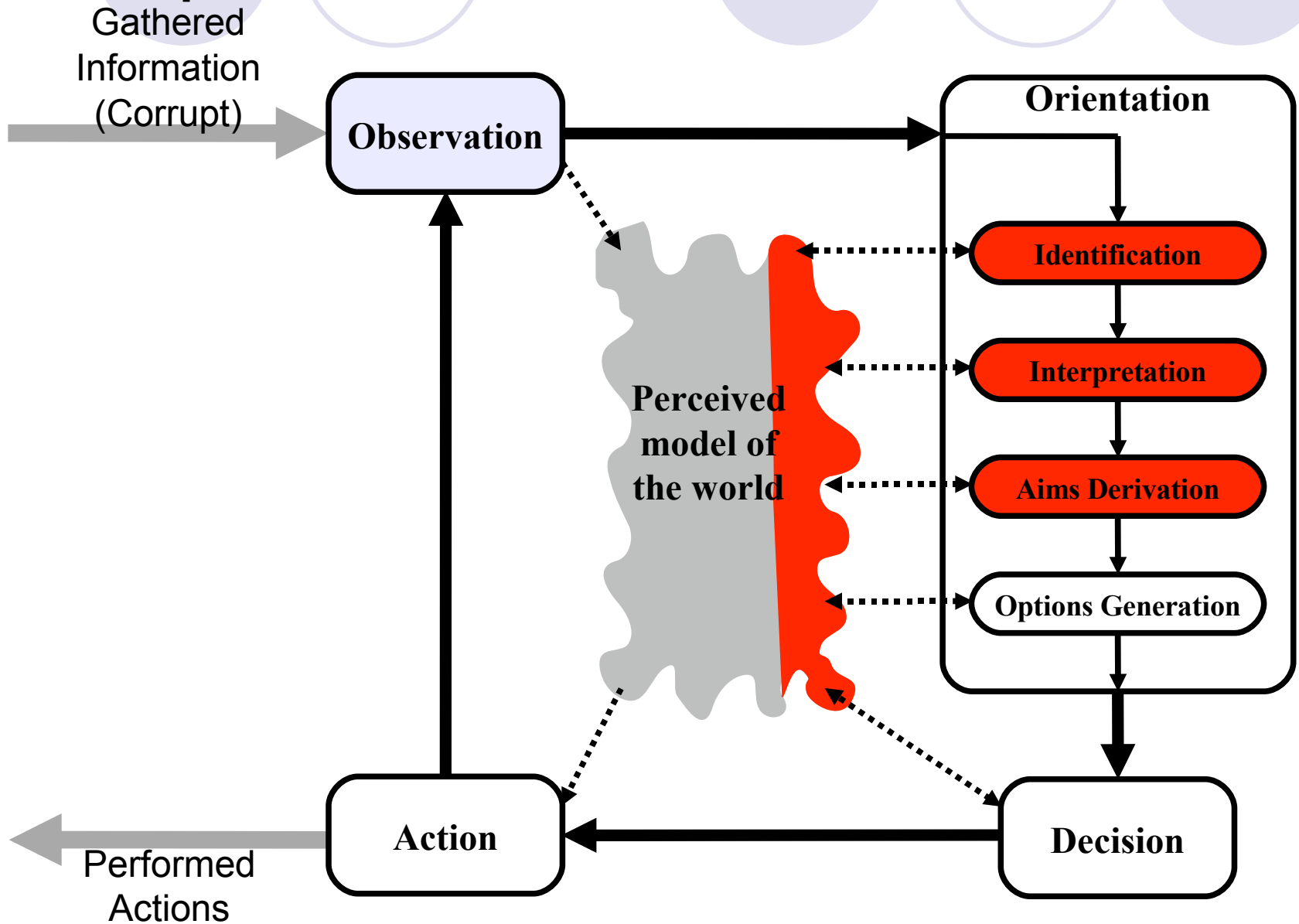
Deception Attack



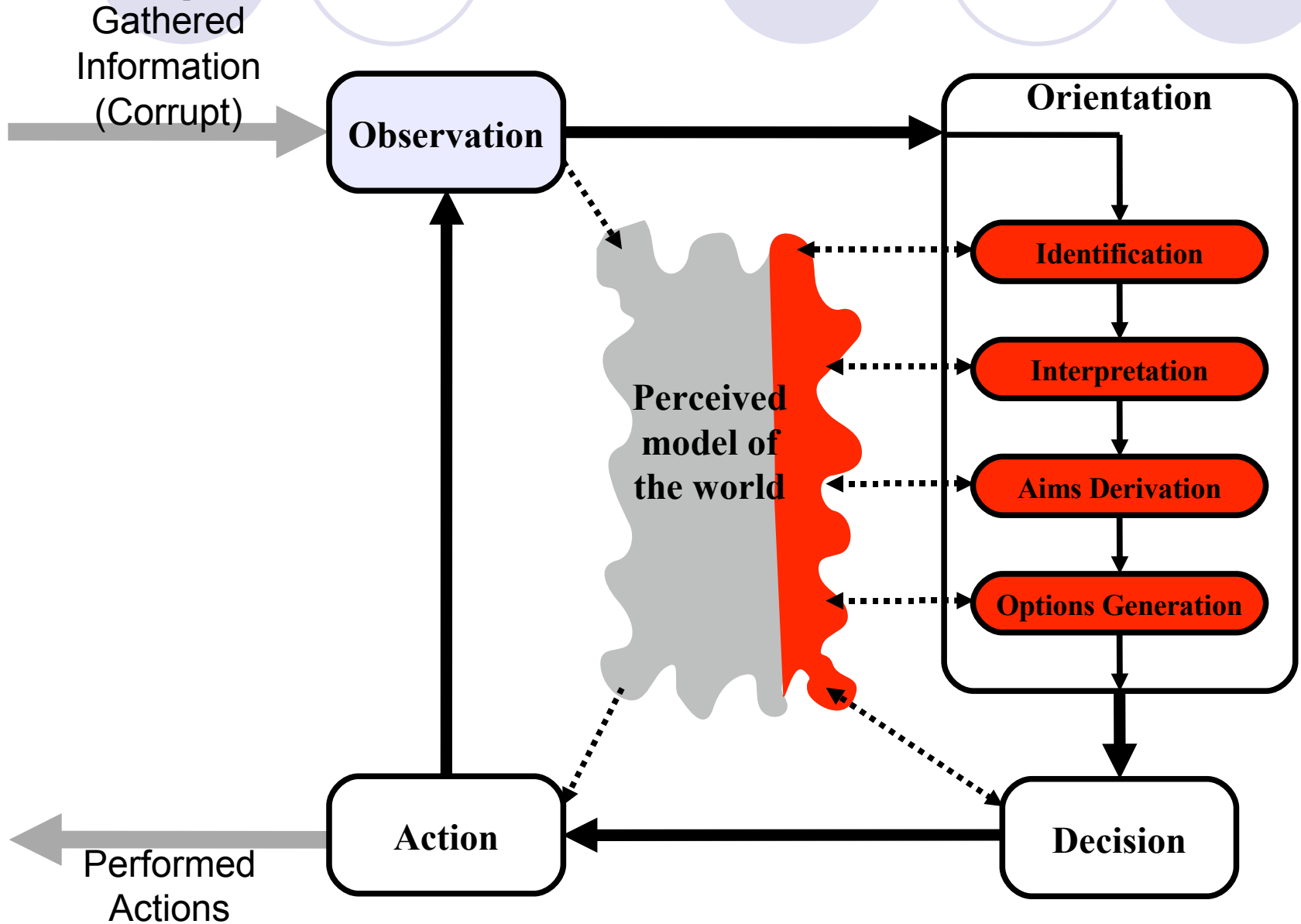
Deception Attack



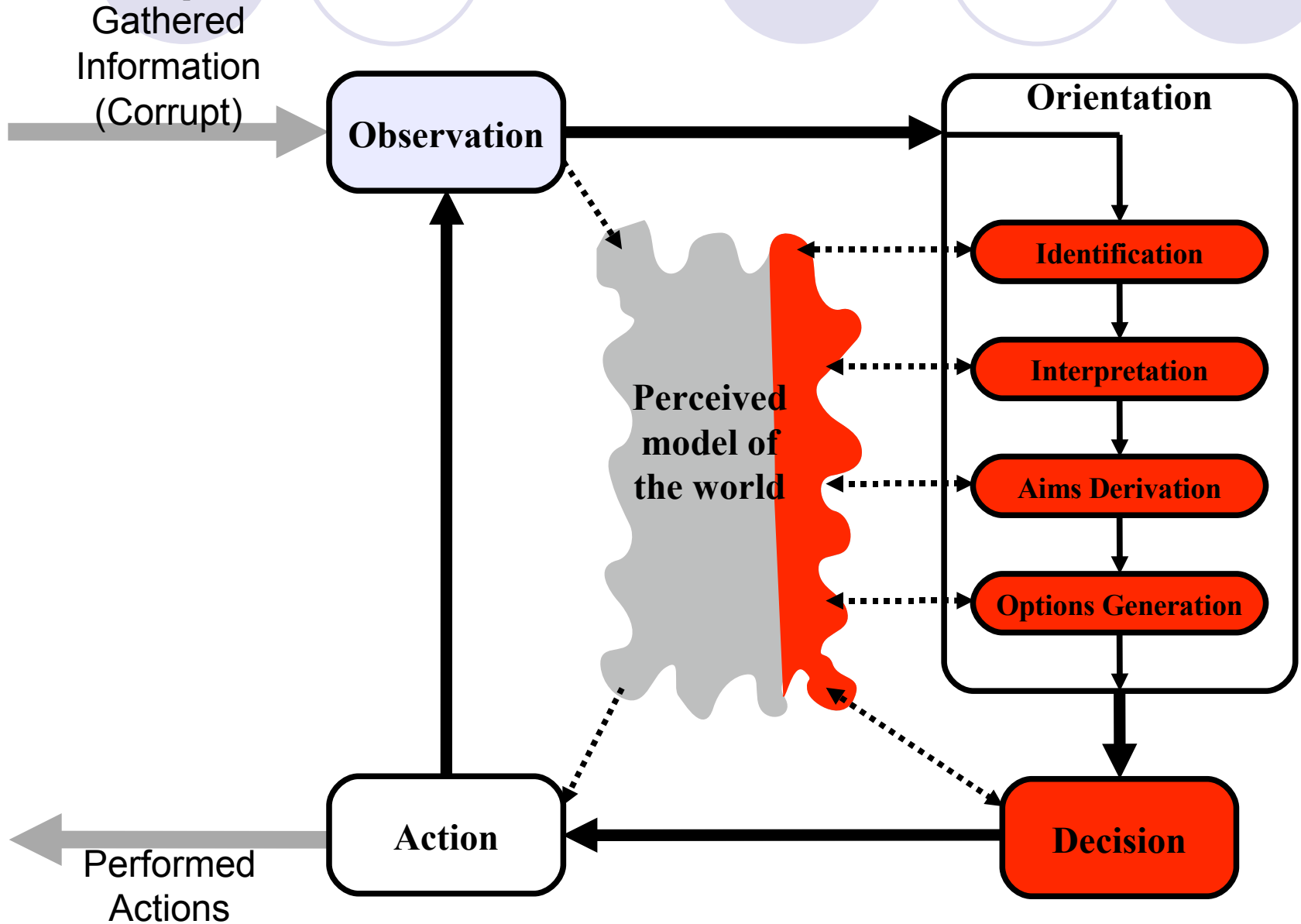
Deception Attack



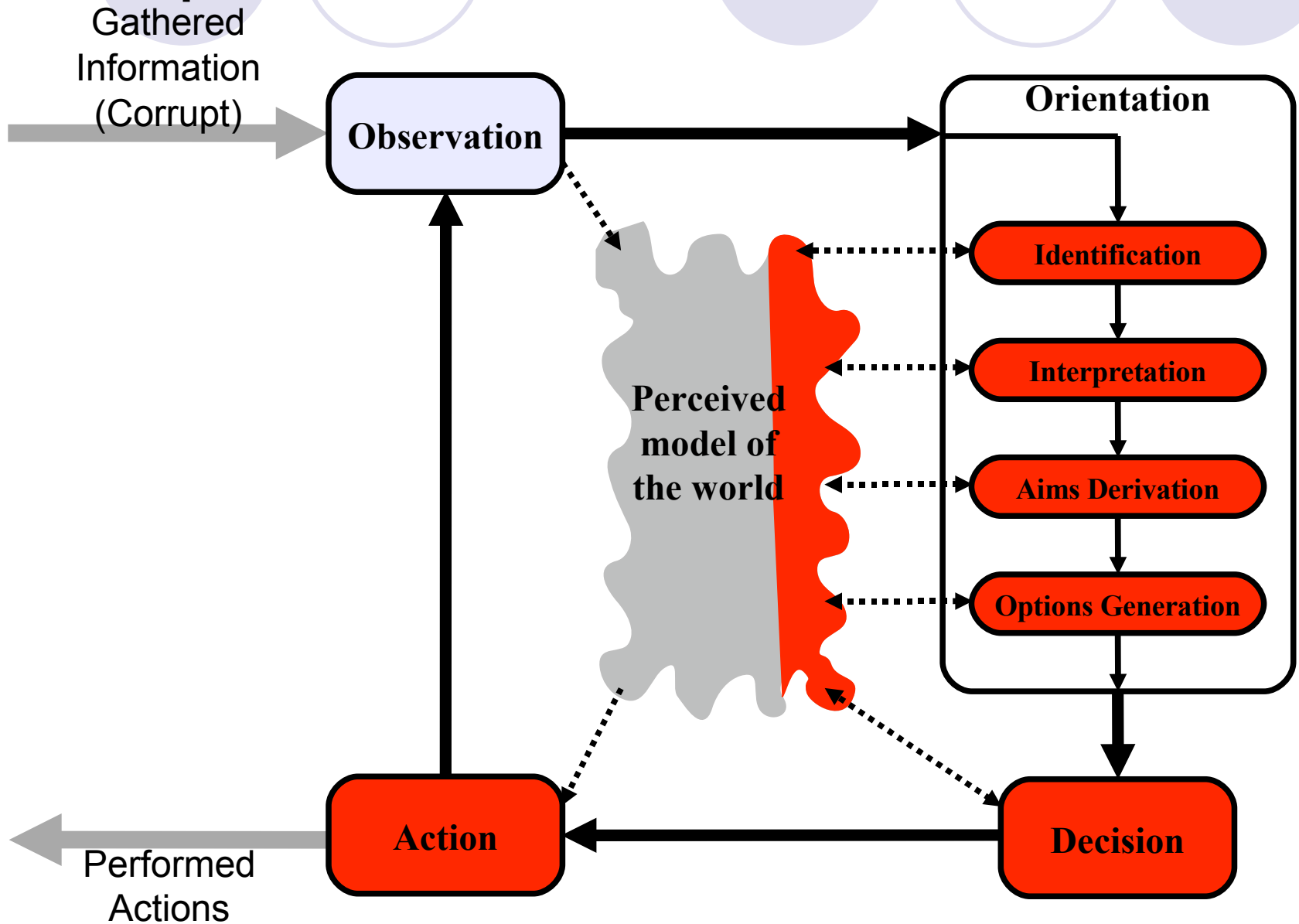
Deception Attack



Deception Attack



Deception Attack

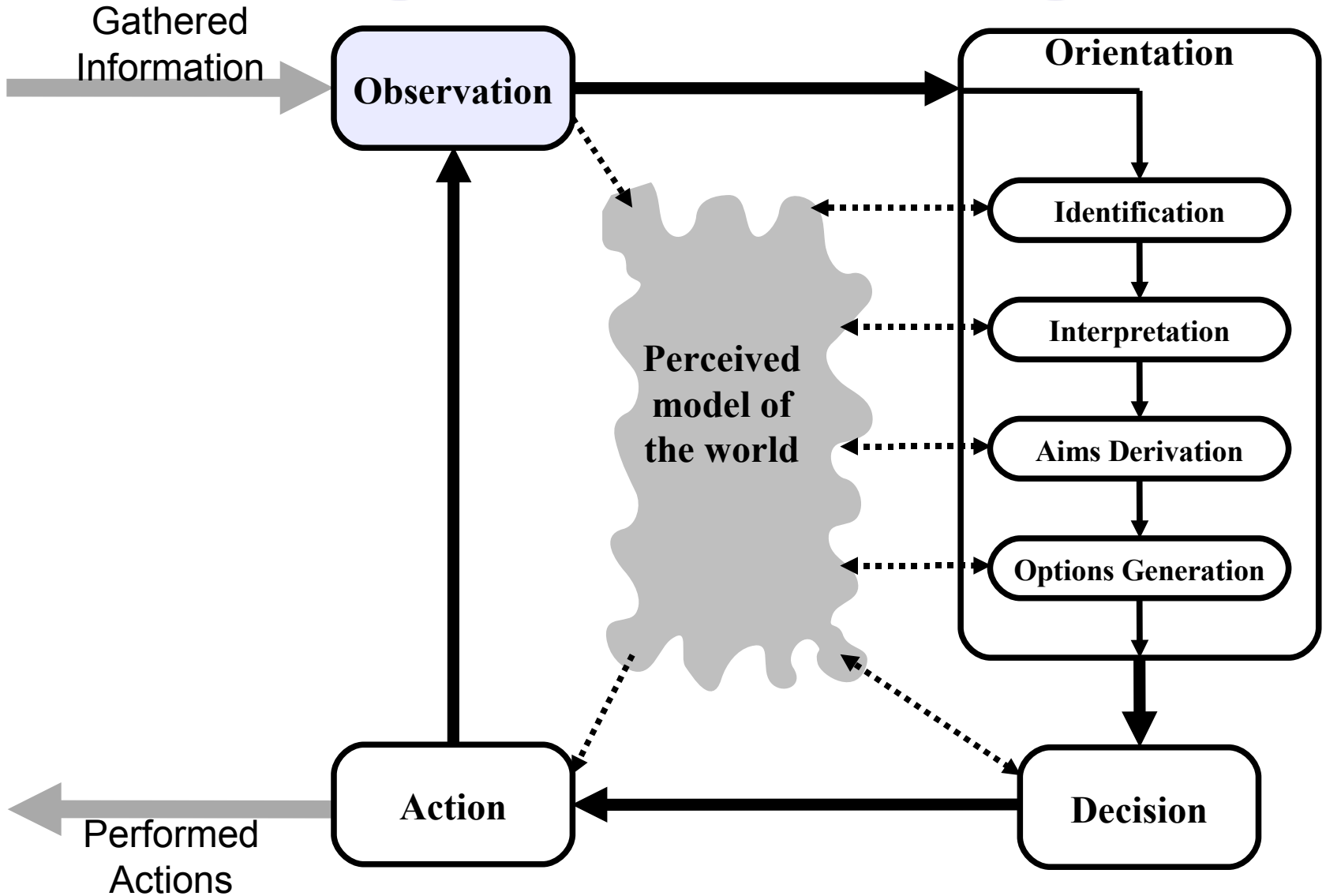


Self-deception

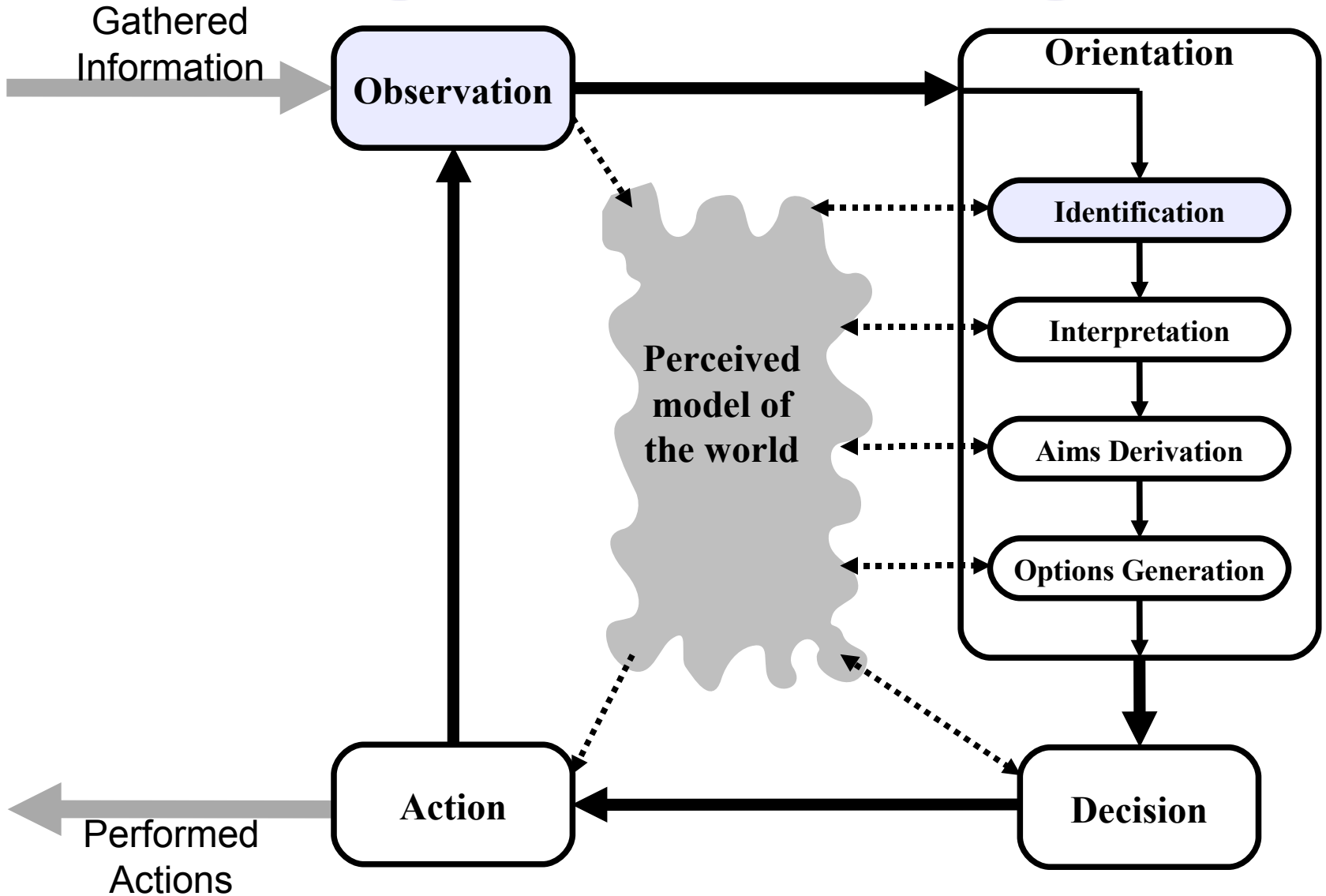


- The word Self-deception suggests that it is a reflexive deception
- Self-deception is defined as an intentional misinterpretation in order to support a desired but unsupportable belief (Szabados 1974)

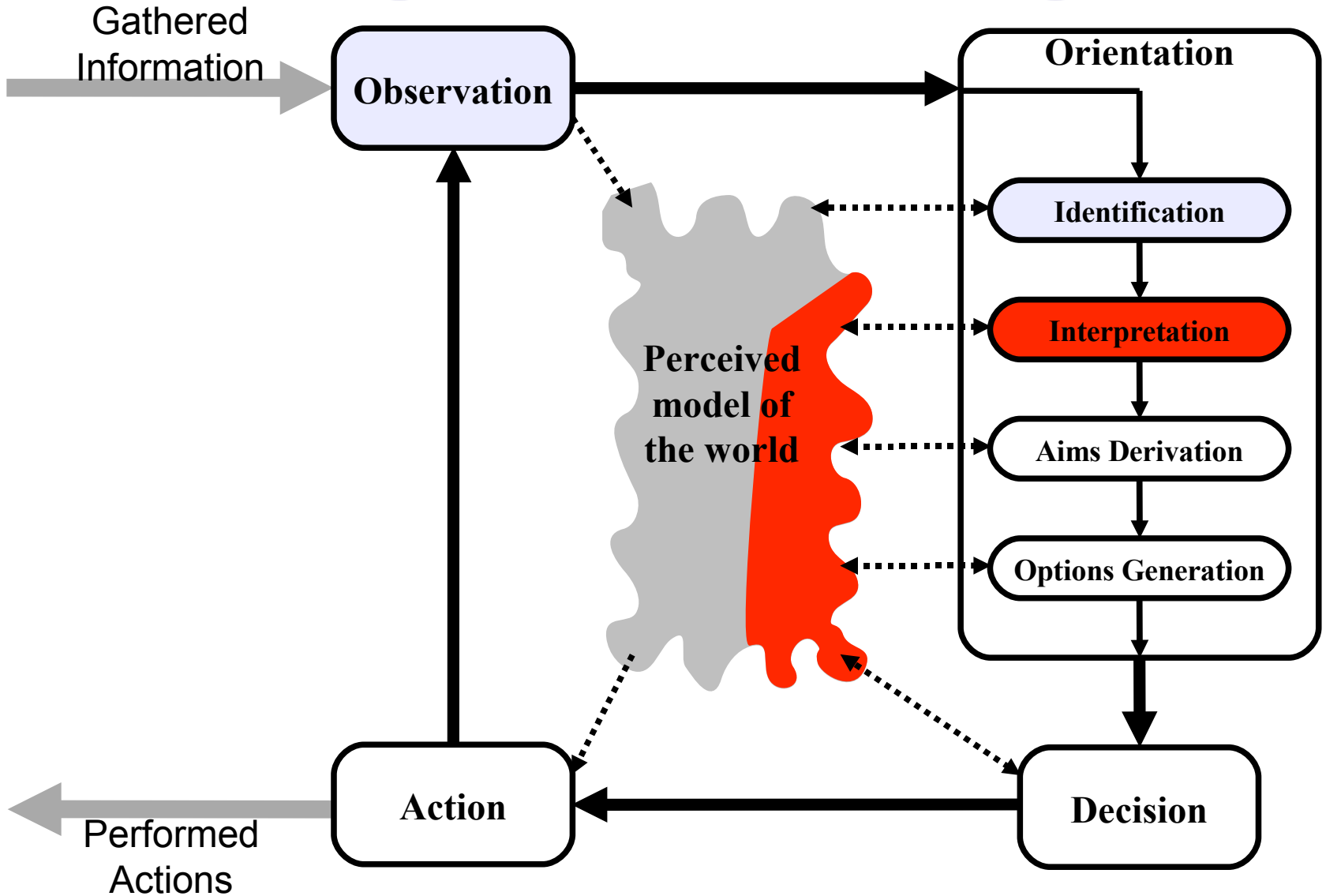
Self-deception



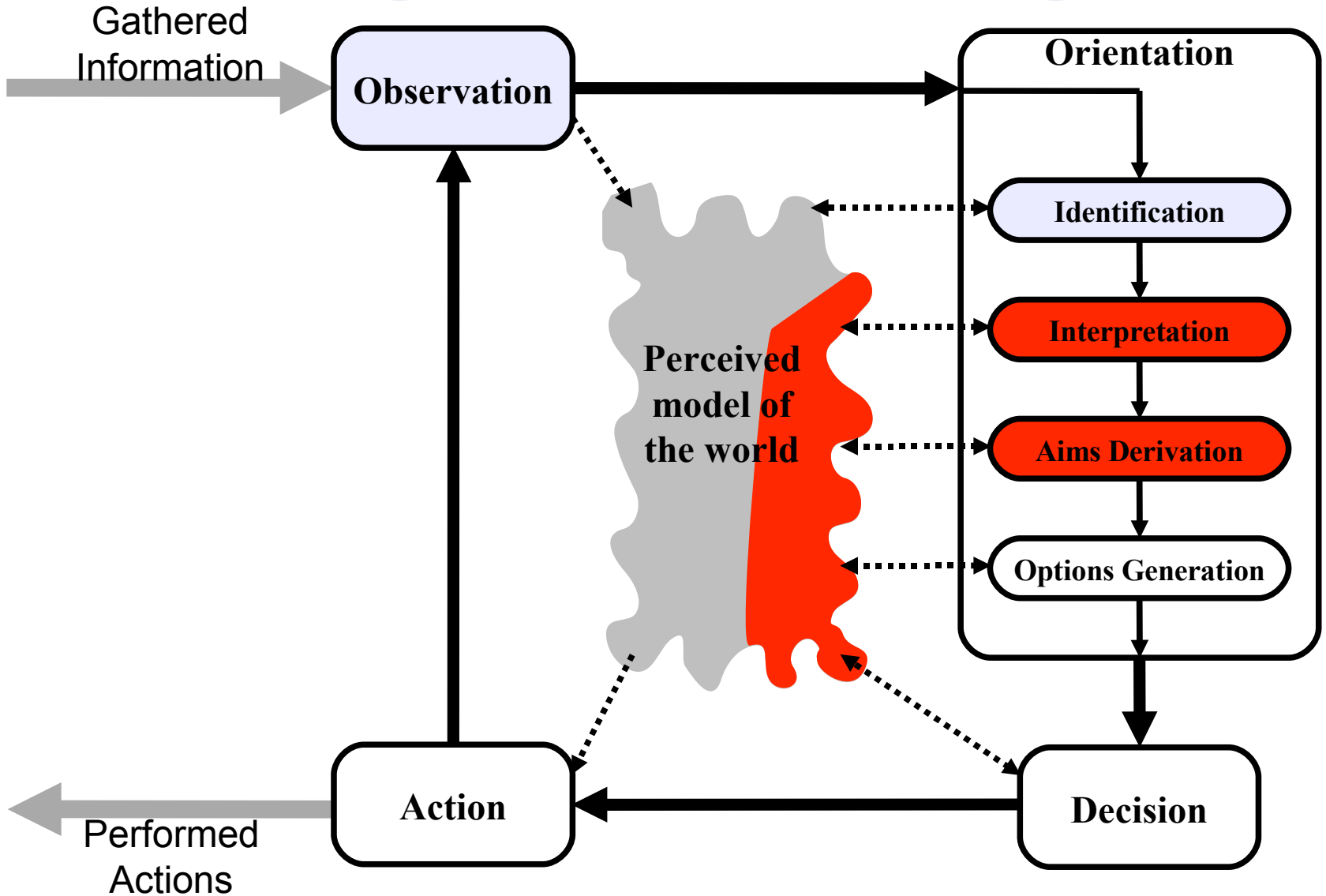
Self-deception



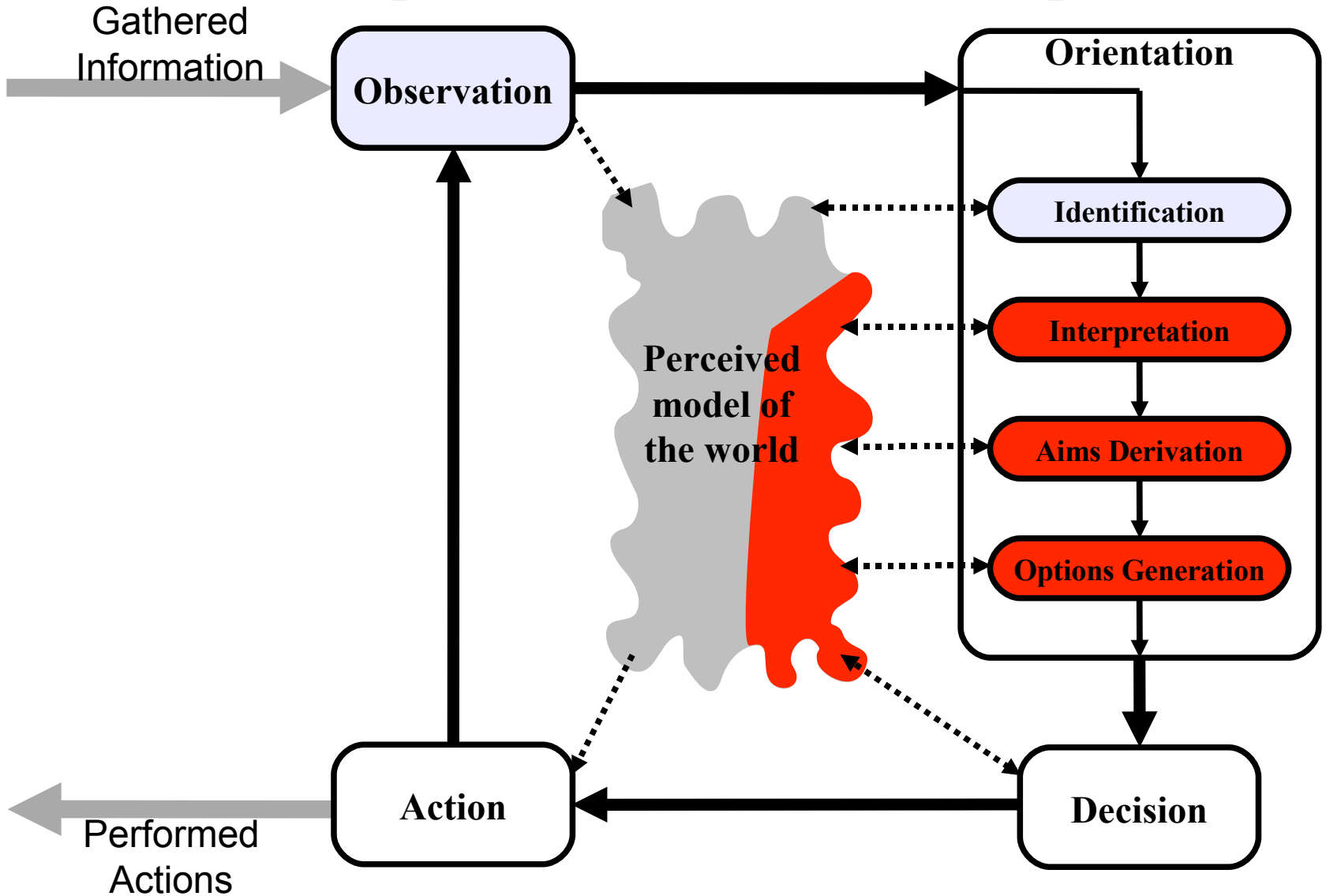
Self-deception



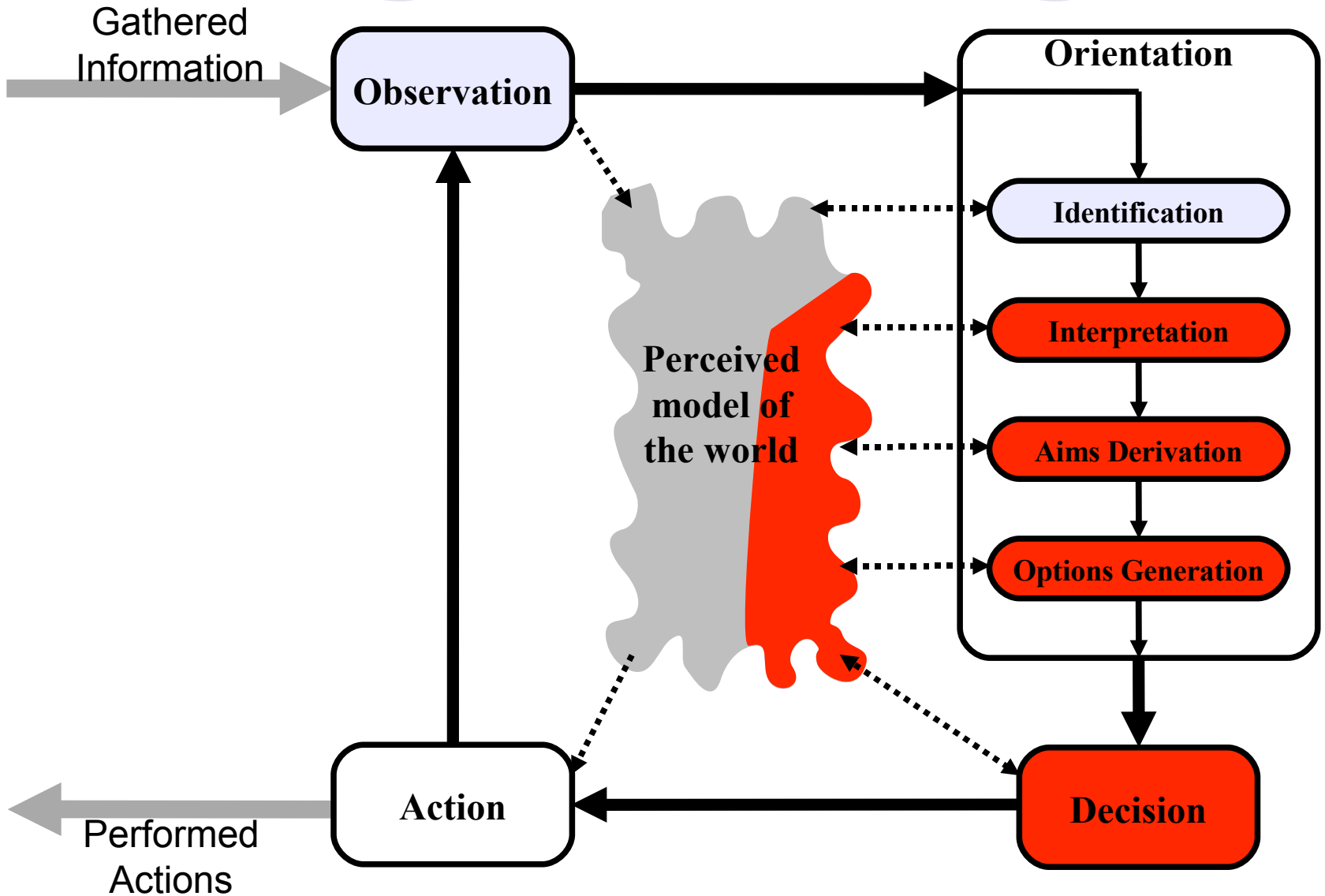
Self-deception



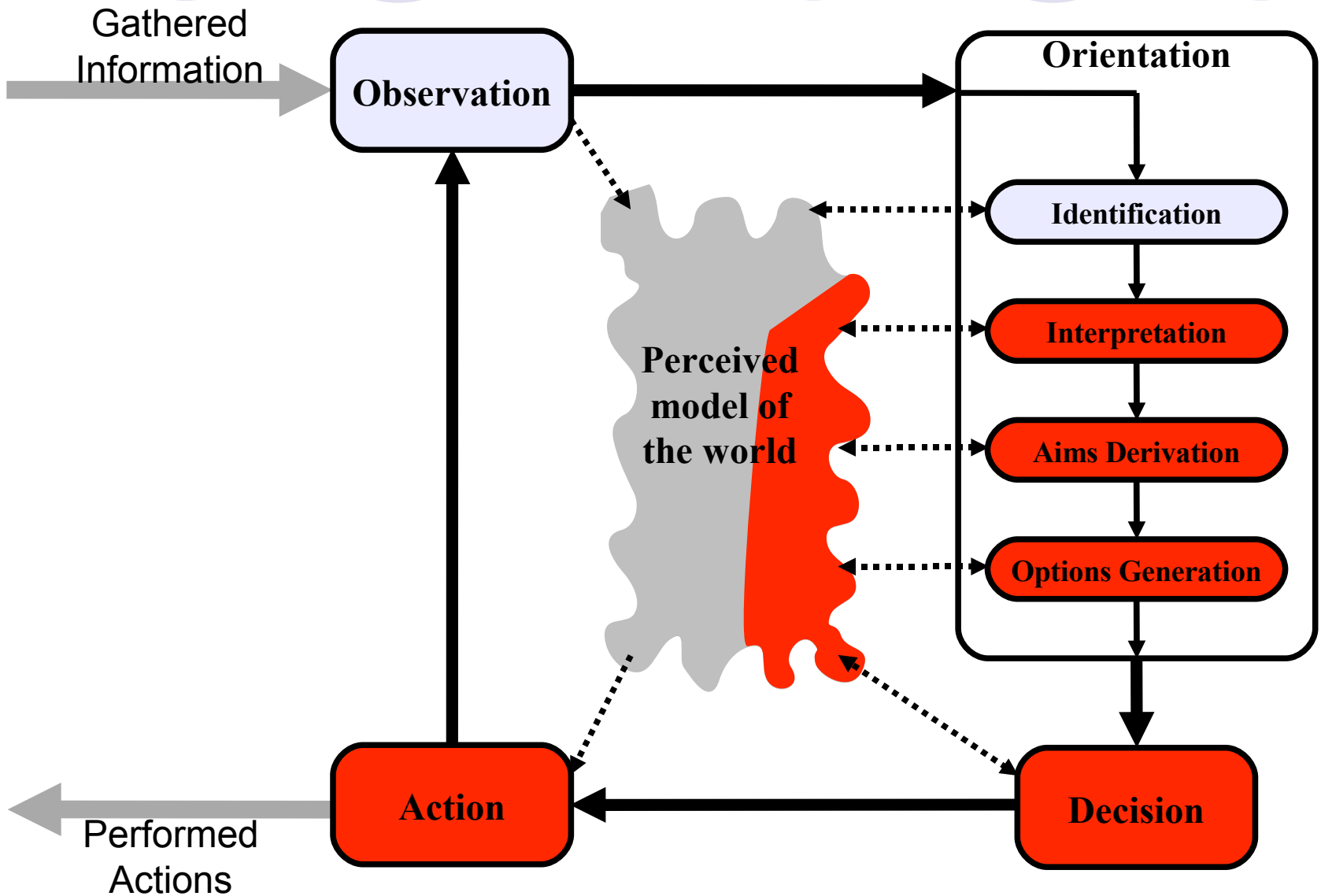
Self-deception



Self-deception



Self-deception





Case Studies

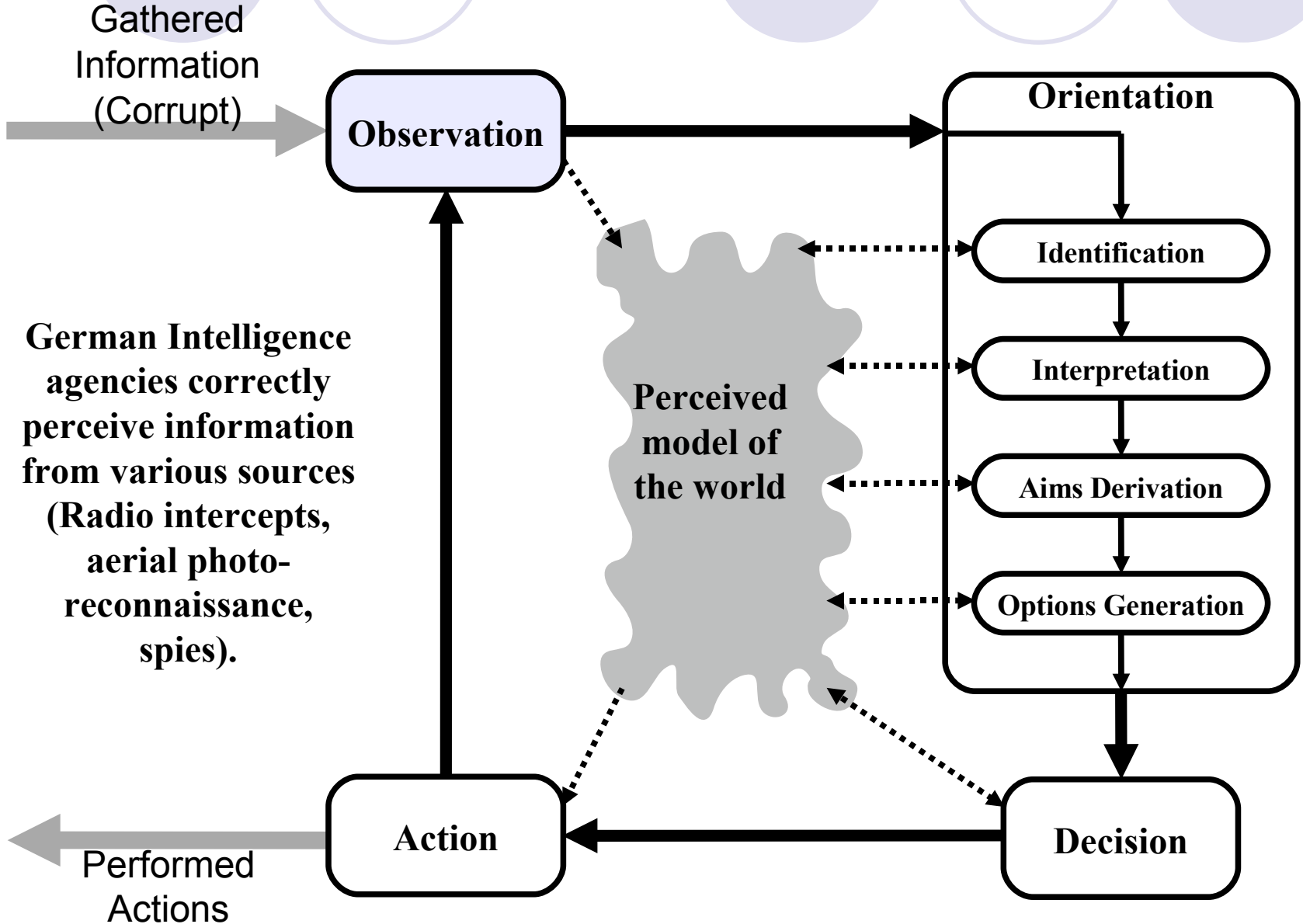
- Demonstrate where deception and self-deception cause errors in the Orientation step of the OODA loop
- Deception – Operation Fortitude
- Self-deception – Challenger Disaster

Operation Fortitude

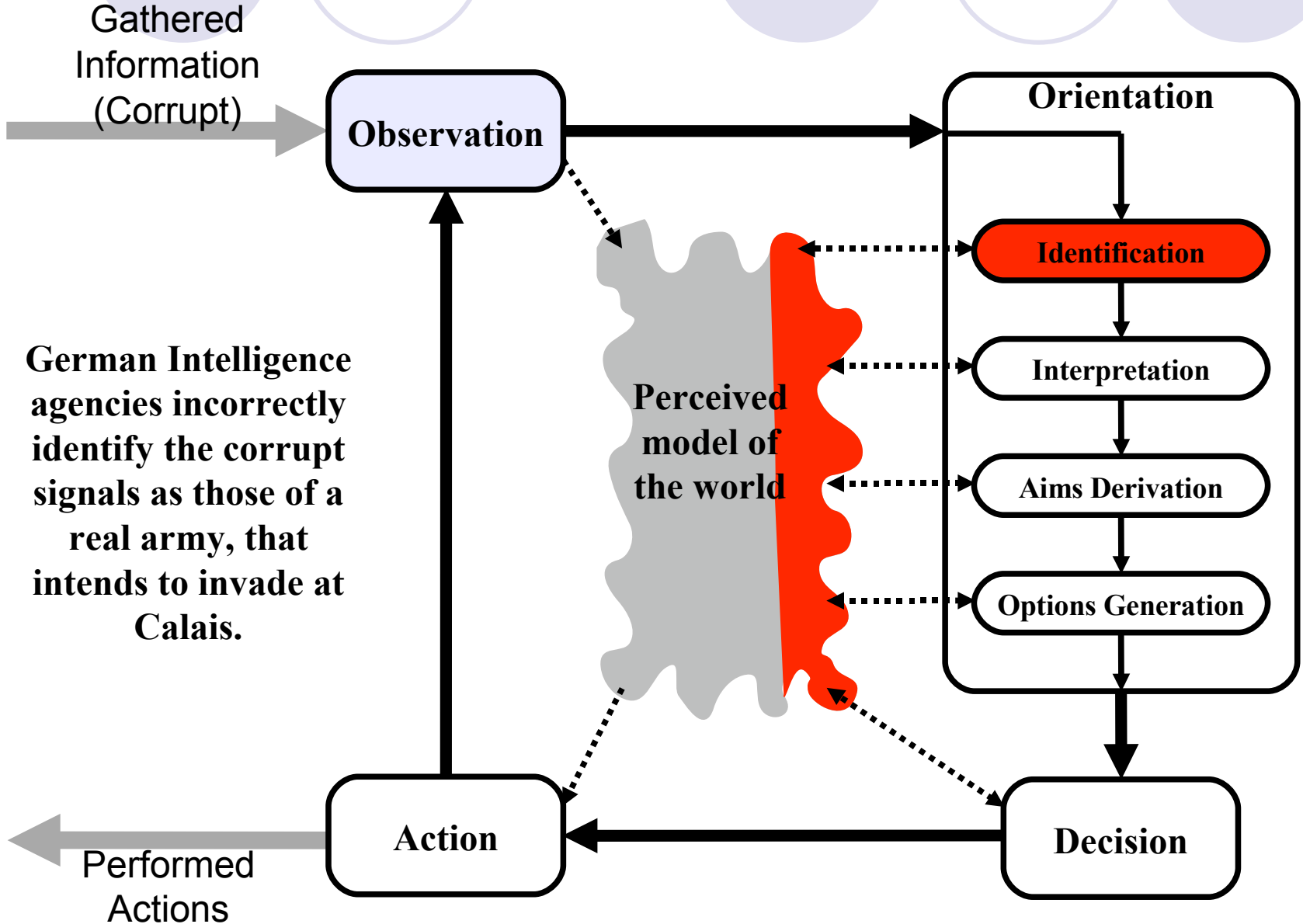


- Deception plan for the D-Day landings during World War II
- Deceived the Germans as to the target of the invasion and the time of the invasion

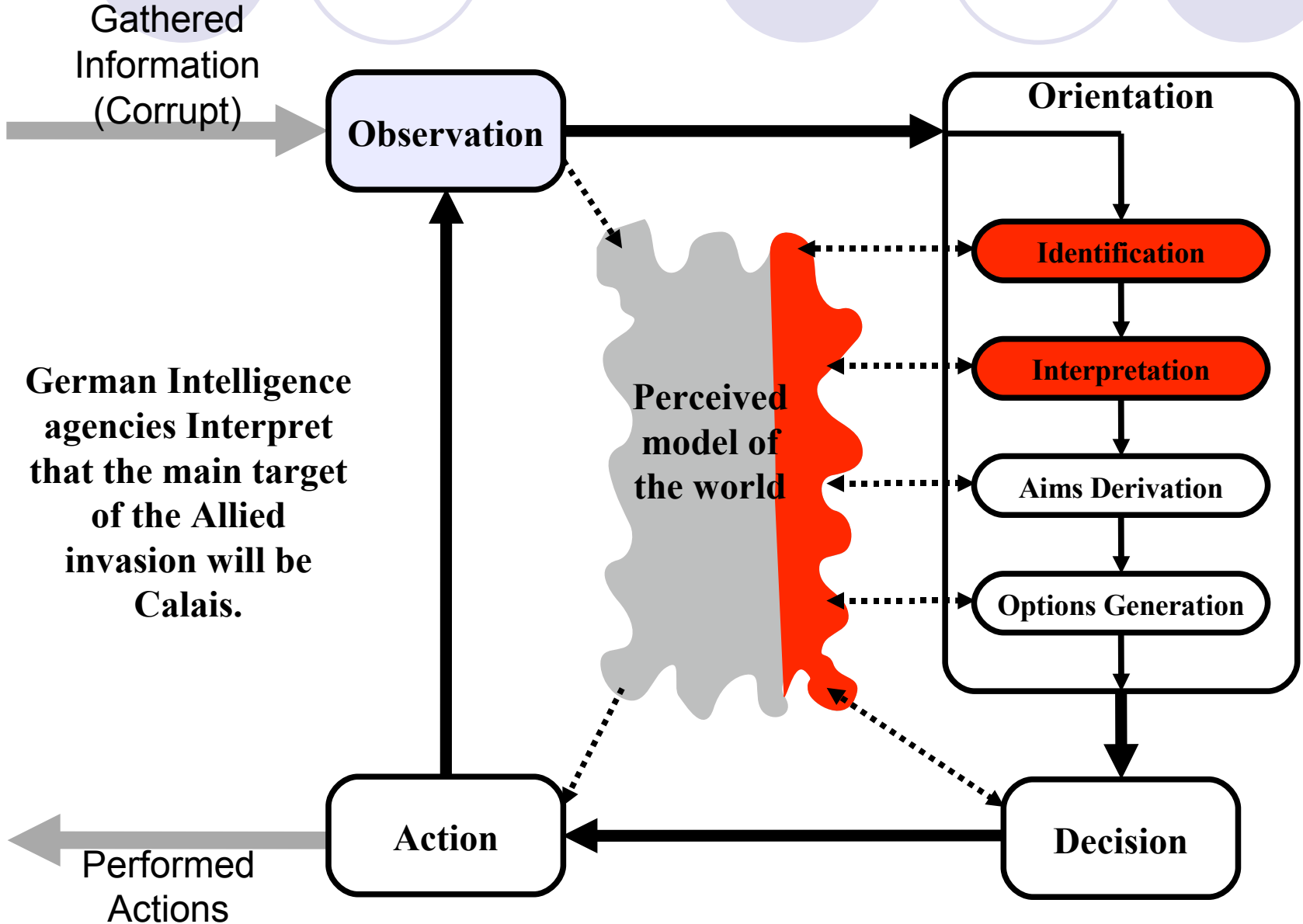
Operation Fortitude



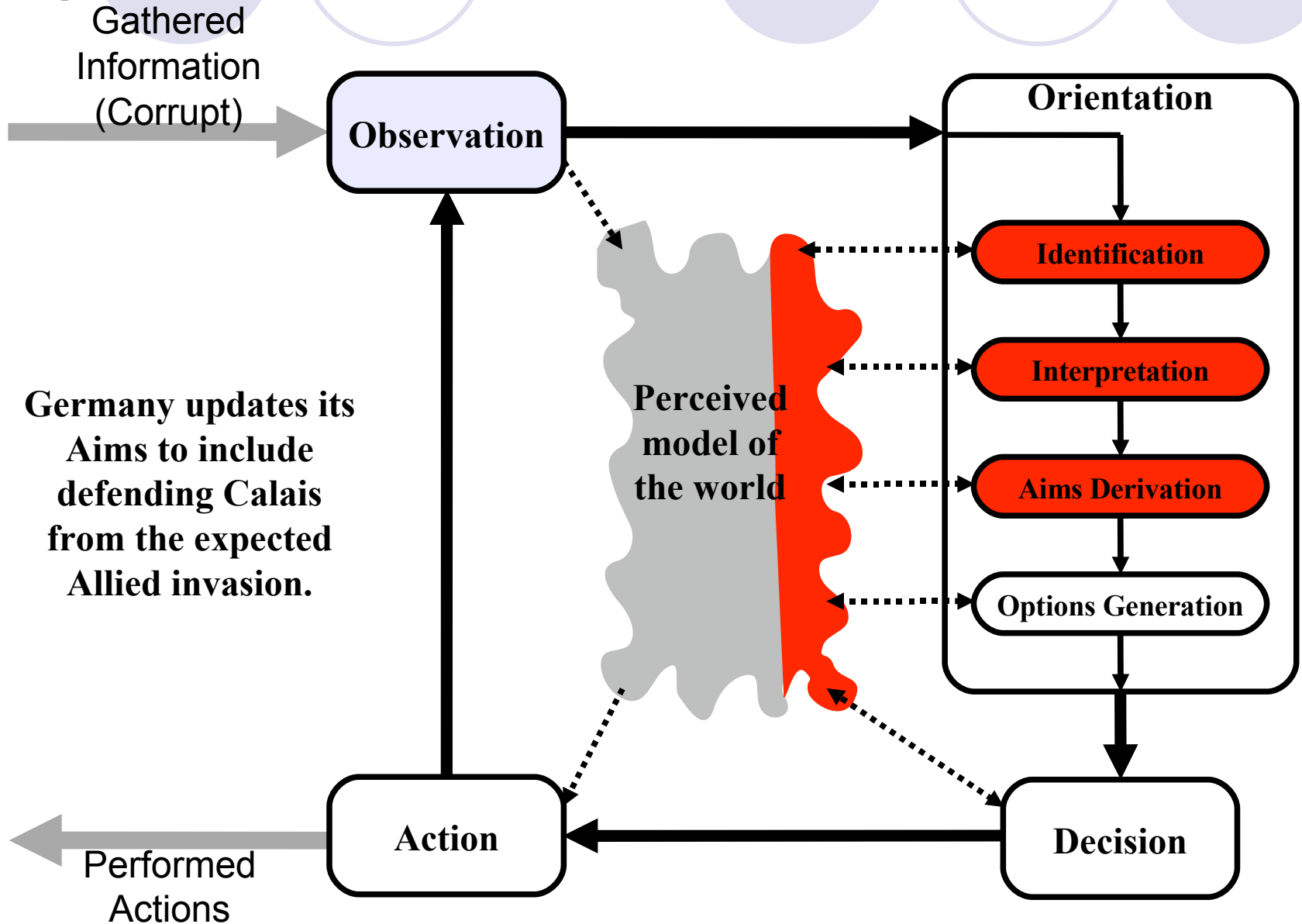
Operation Fortitude



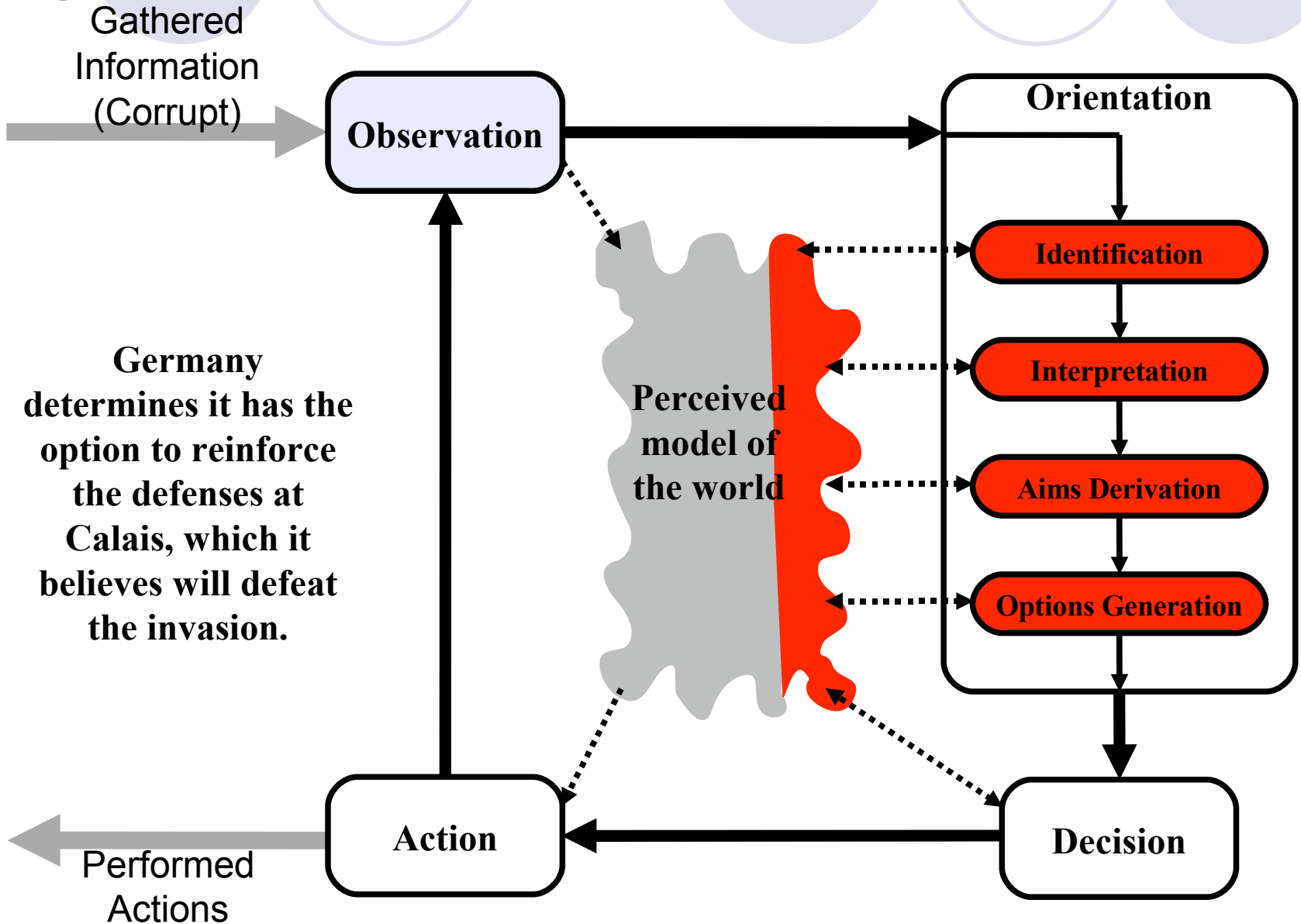
Operation Fortitude



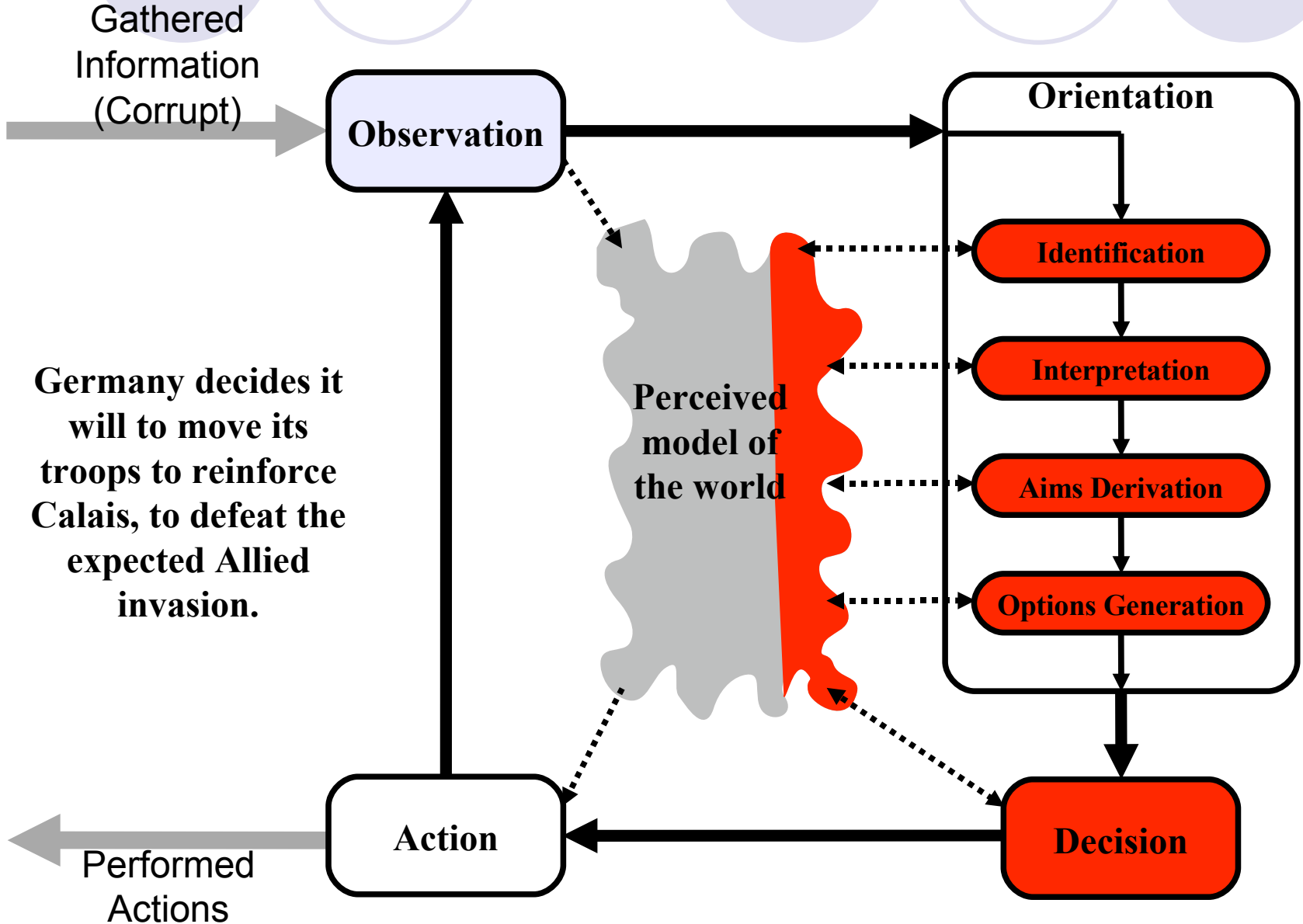
Operation Fortitude



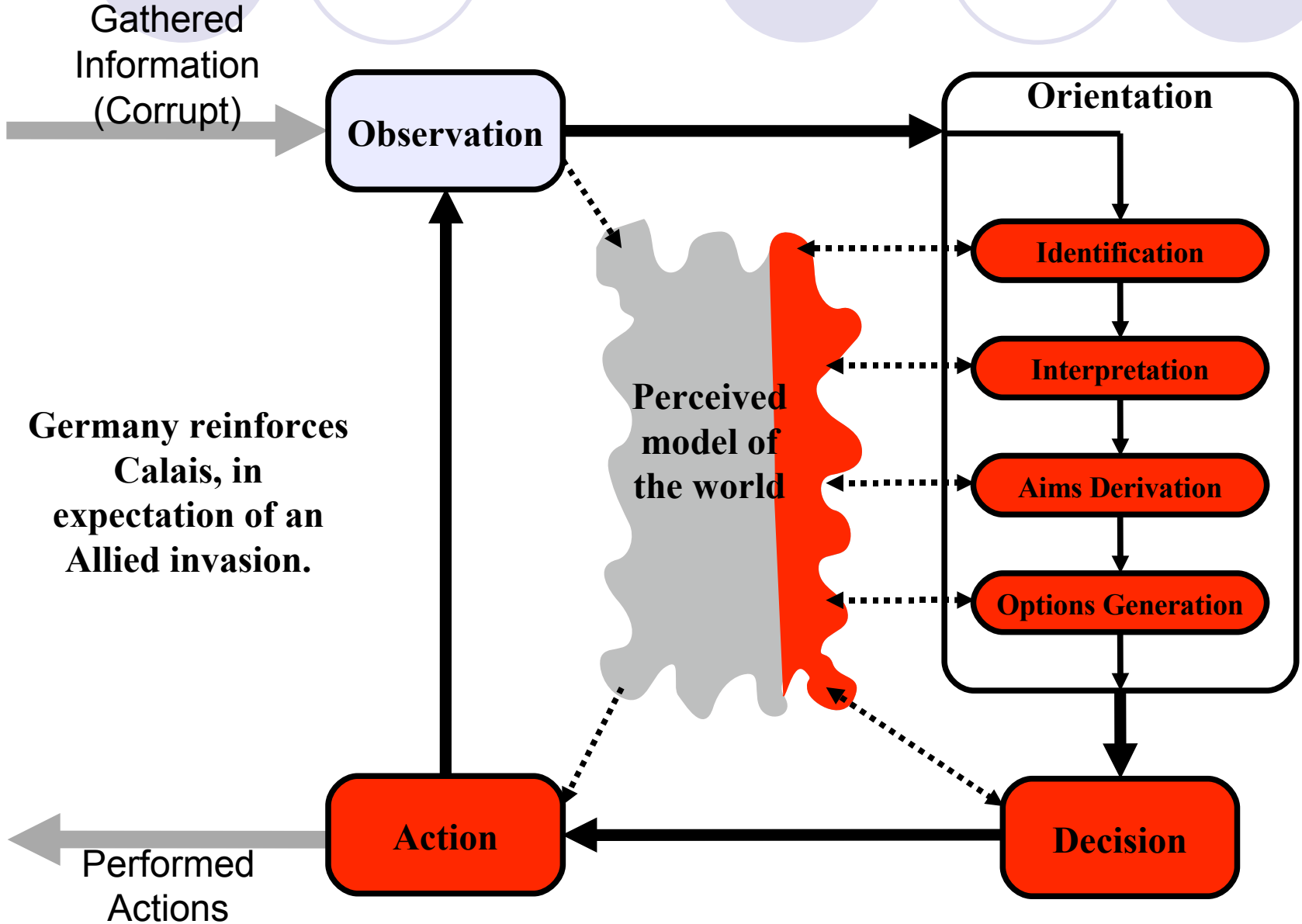
Operation Fortitude



Operation Fortitude



Operation Fortitude

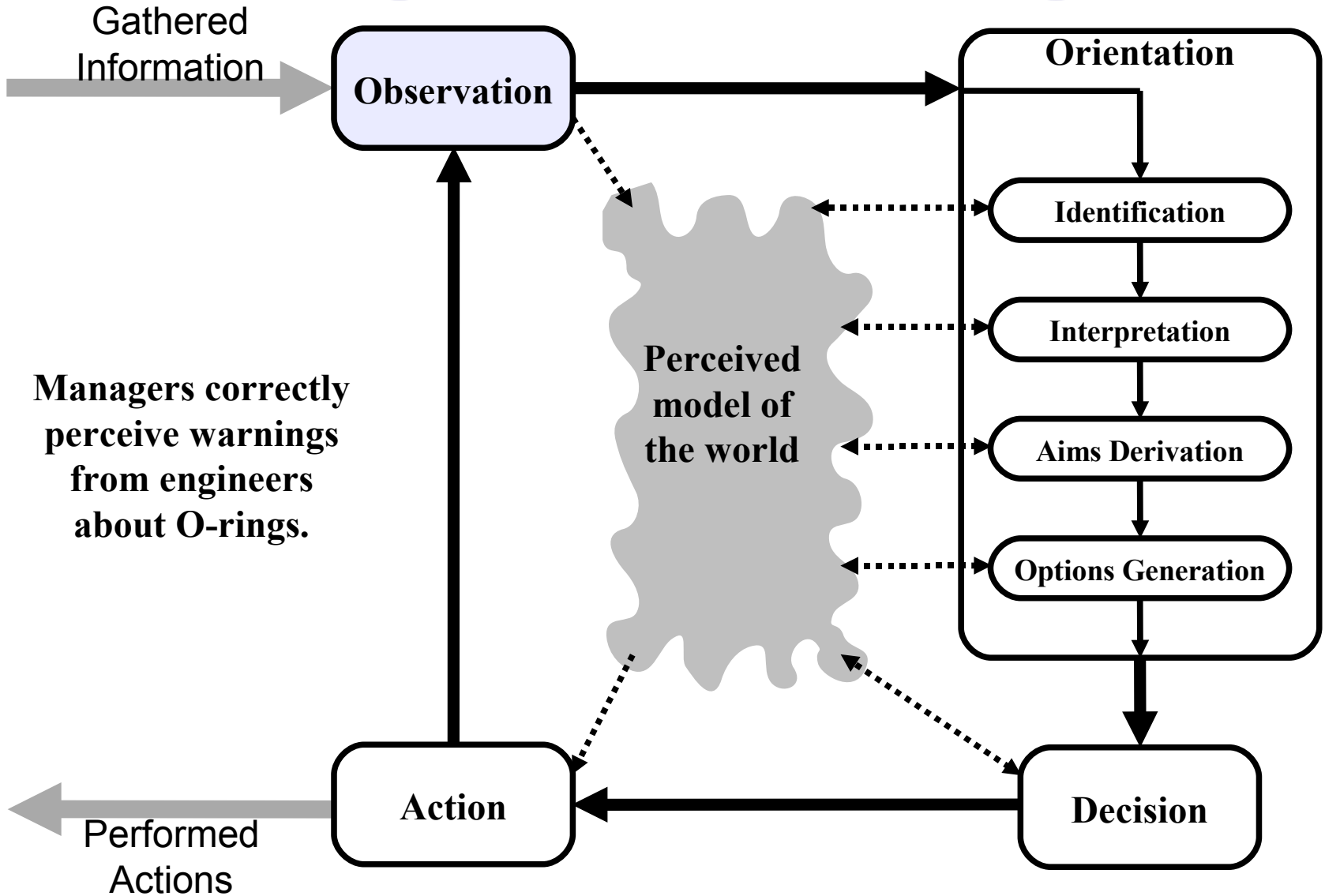


Challenger Disaster

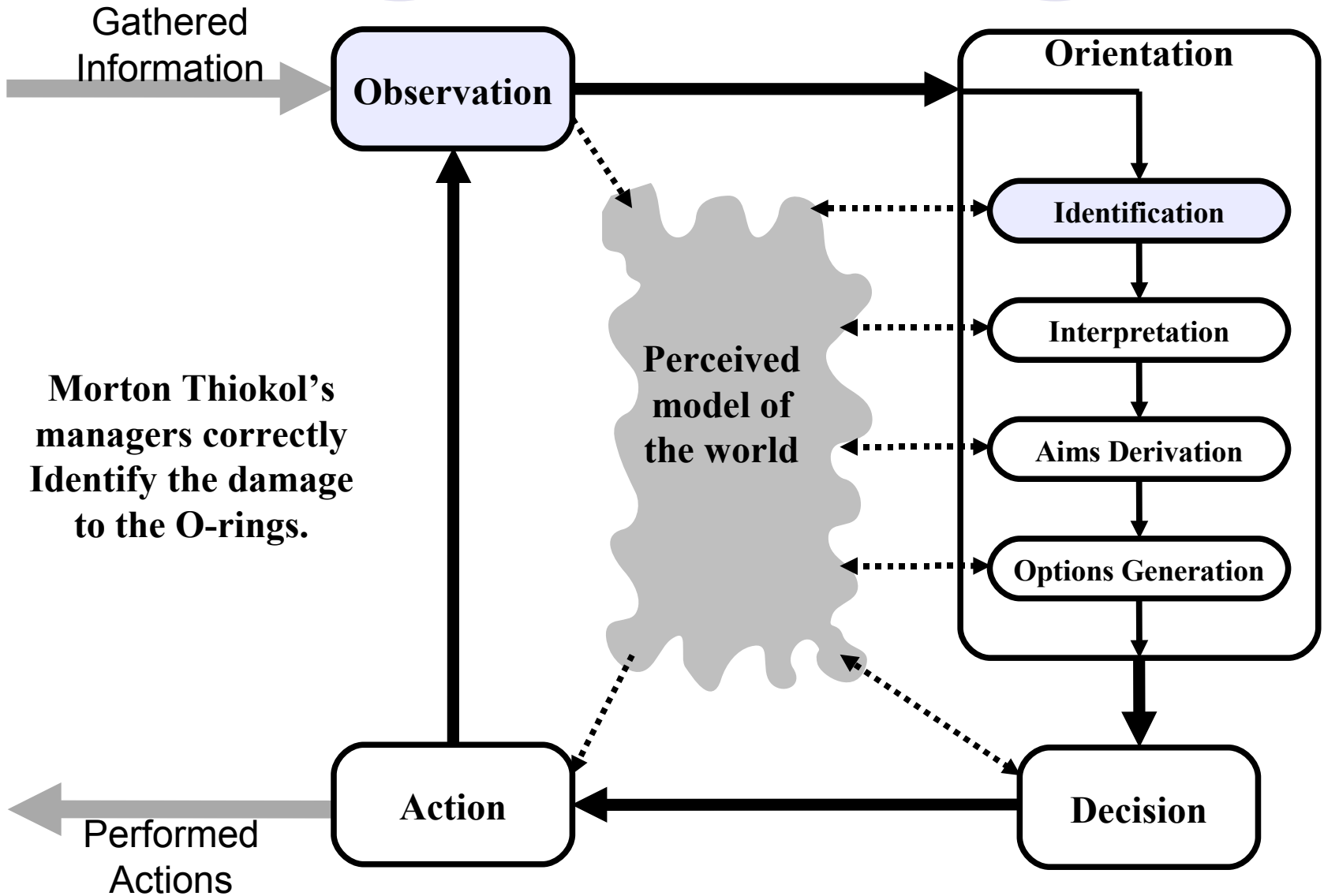


- The space shuttle Challenger disintegrated shortly after takeoff due to an O-ring failure, caused by the low temperature at the time of the launch
- The self-deception in this disaster was performed by Morton Thiokol management
- They were warned that the O-rings were damaged more during low temperature launches, however they misinterpreted the damage as proof of a safety factor

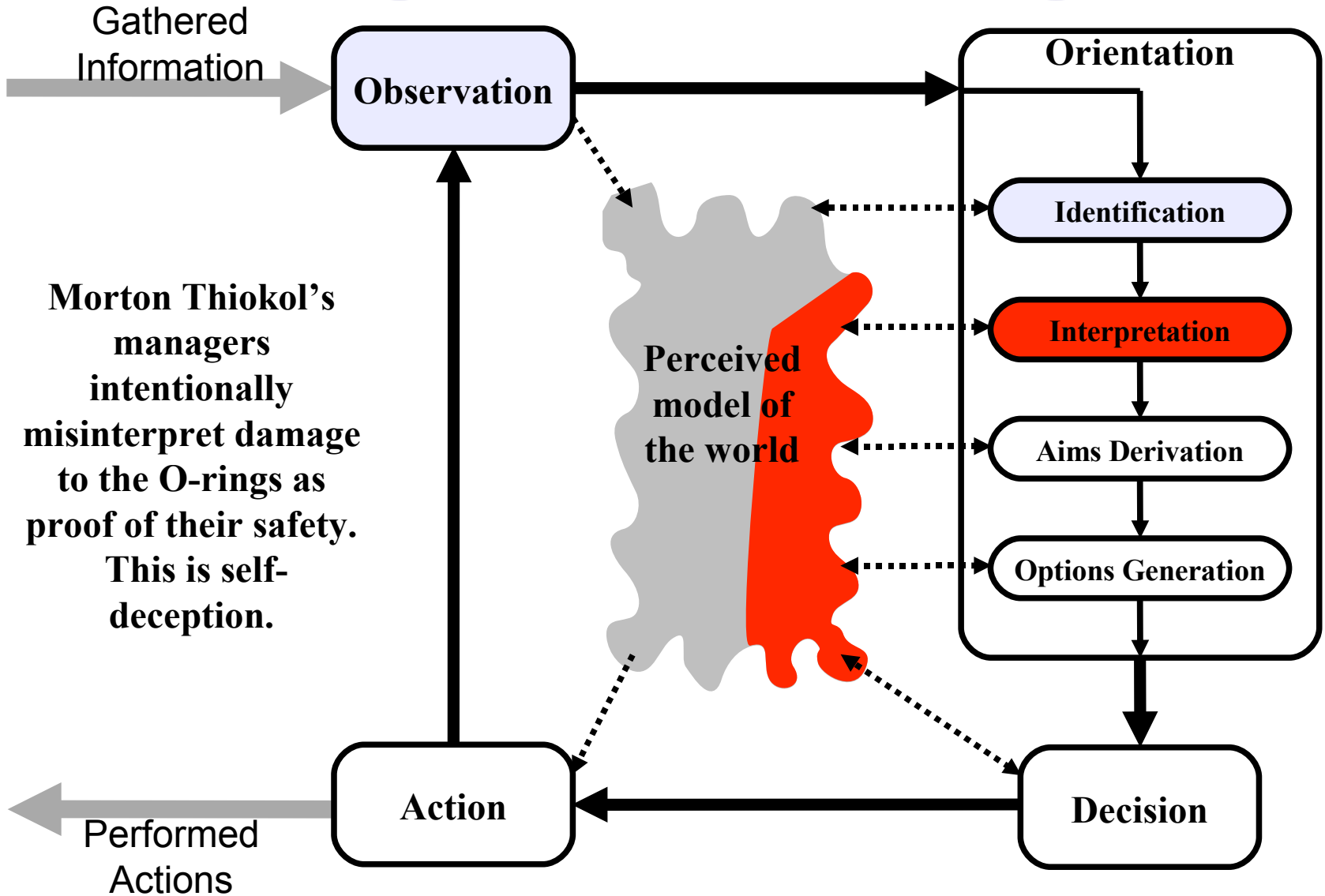
Challenger Disaster



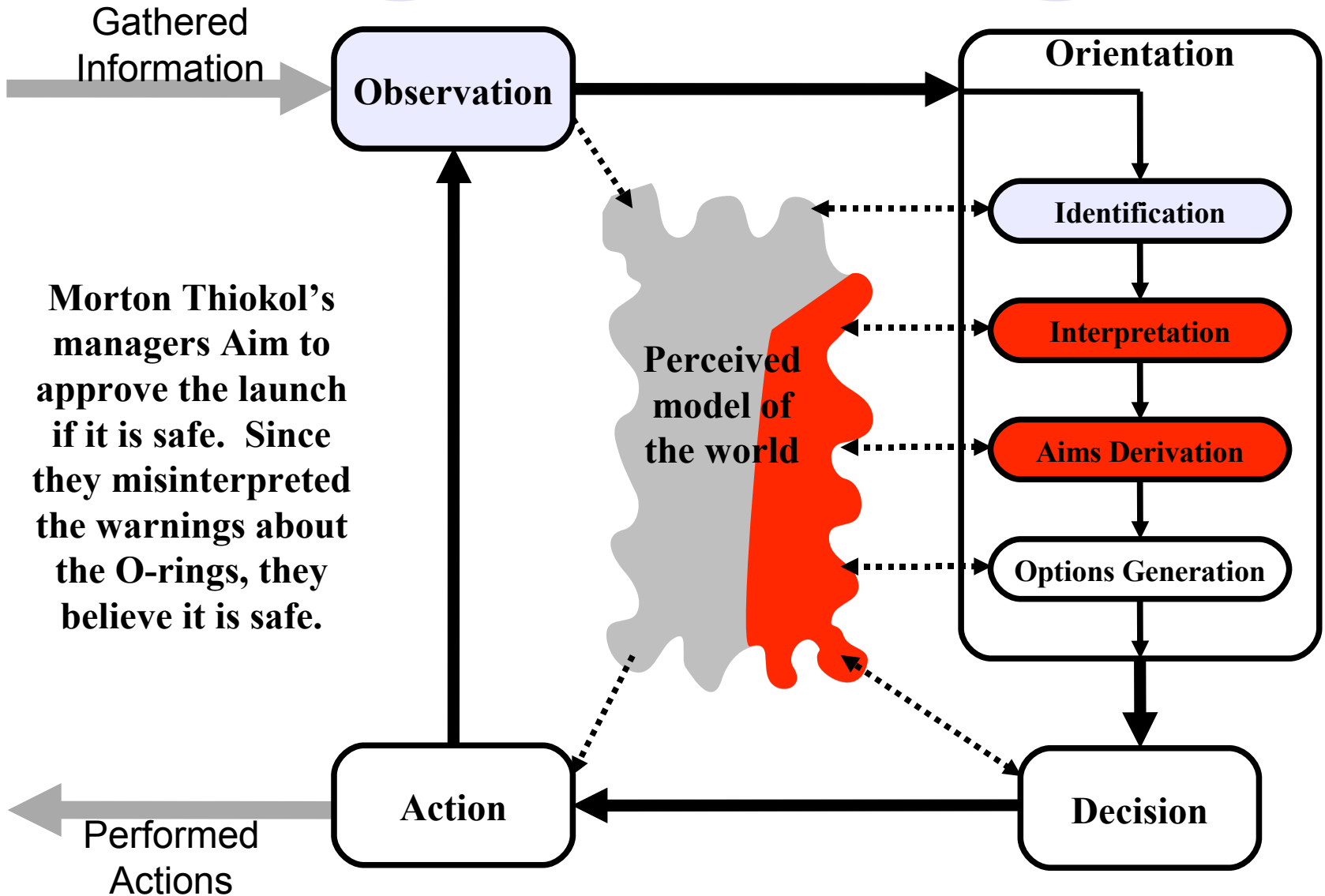
Challenger Disaster



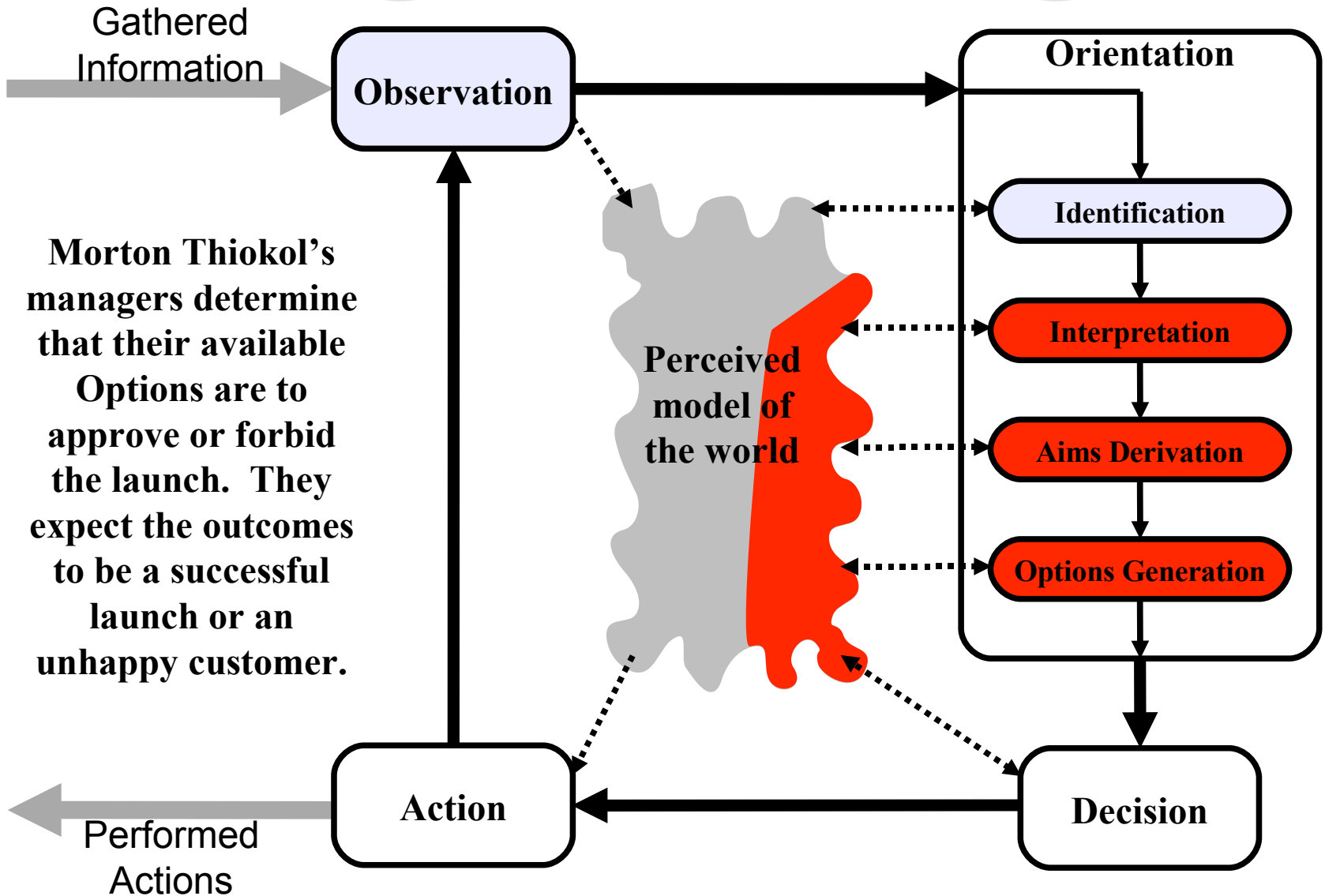
Challenger Disaster



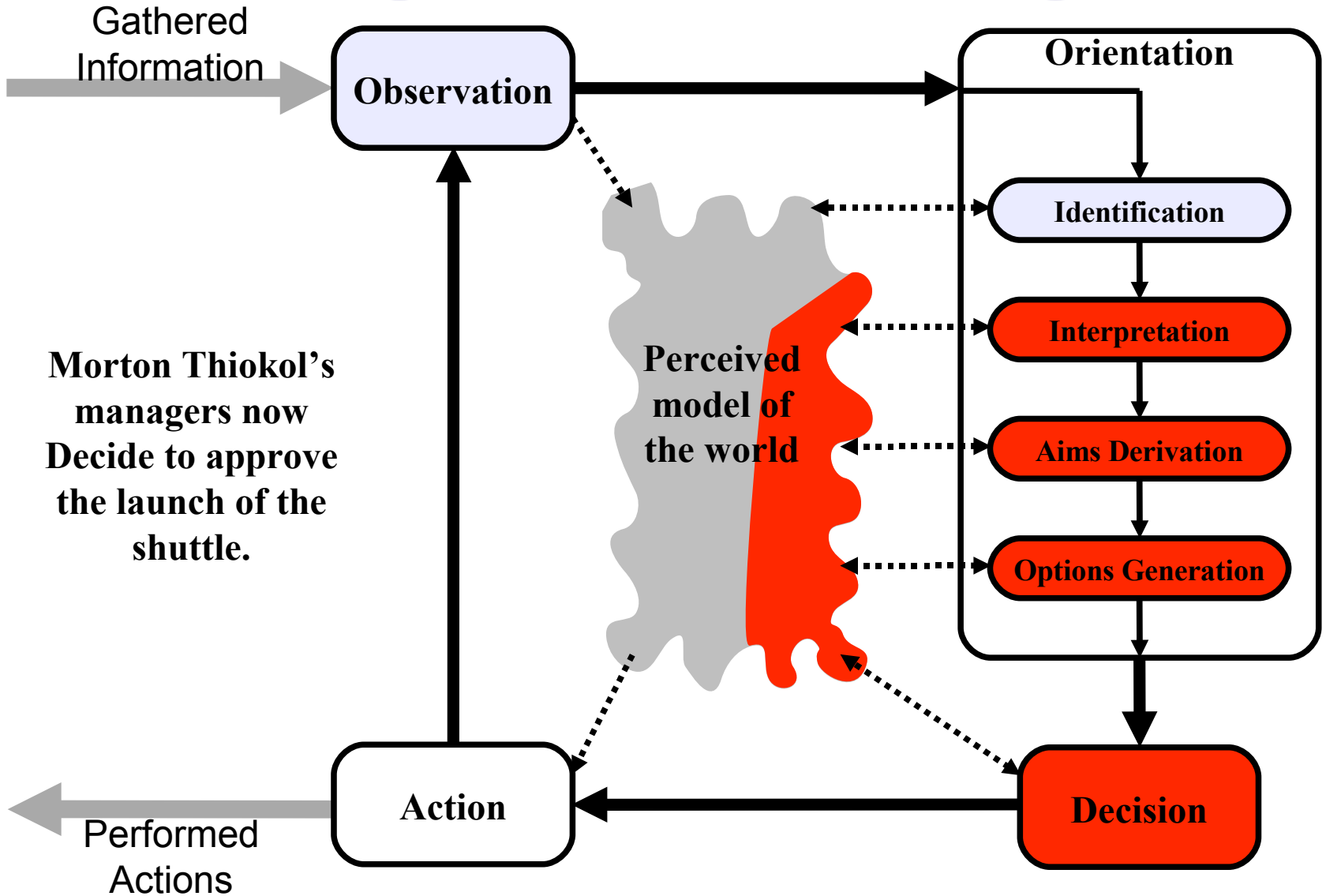
Challenger Disaster



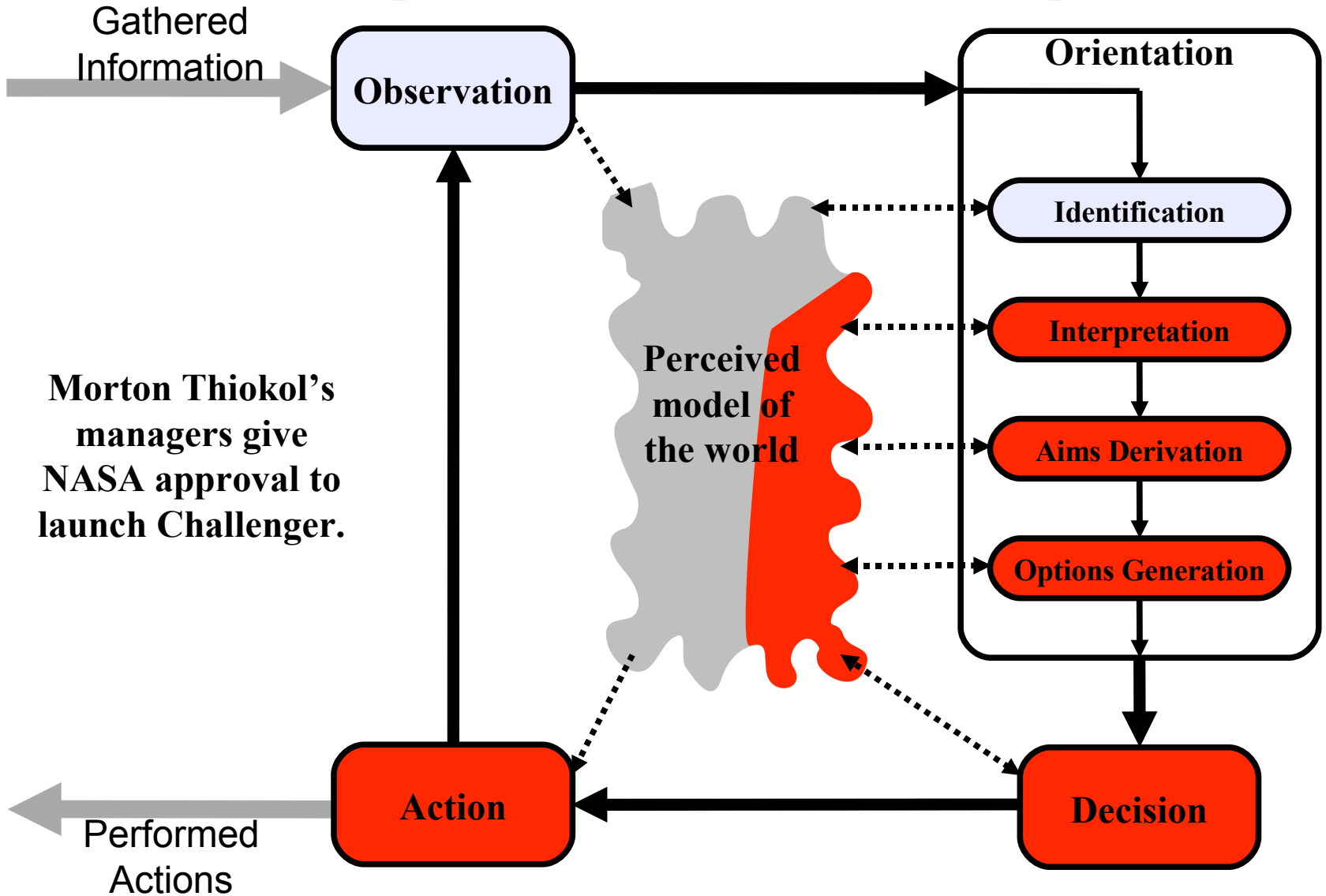
Challenger Disaster



Challenger Disaster



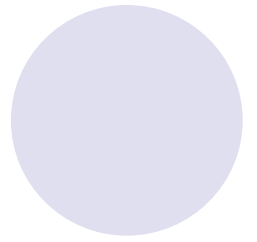
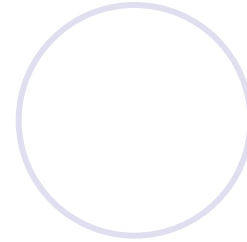
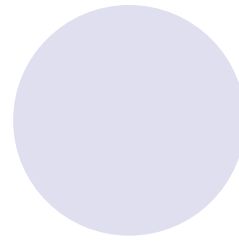
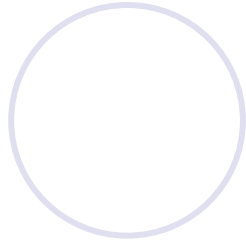
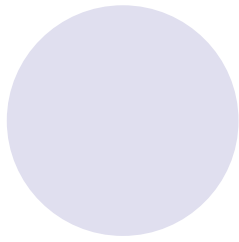
Challenger Disaster





Conclusion

- Orientation step details the updating of the decision-maker's model of the world and as such is a target for IW attacks
- Described a model of the internal processes of the Orientation step



Questions?