
INSTANA

William Louth

Complexity Scientist

Observability

Service Cognition

Universal Signals

Episodic Memories

Controllability

Resilience Engineering

QoS for Applications

Resource Management

Self-Adaptive Systems

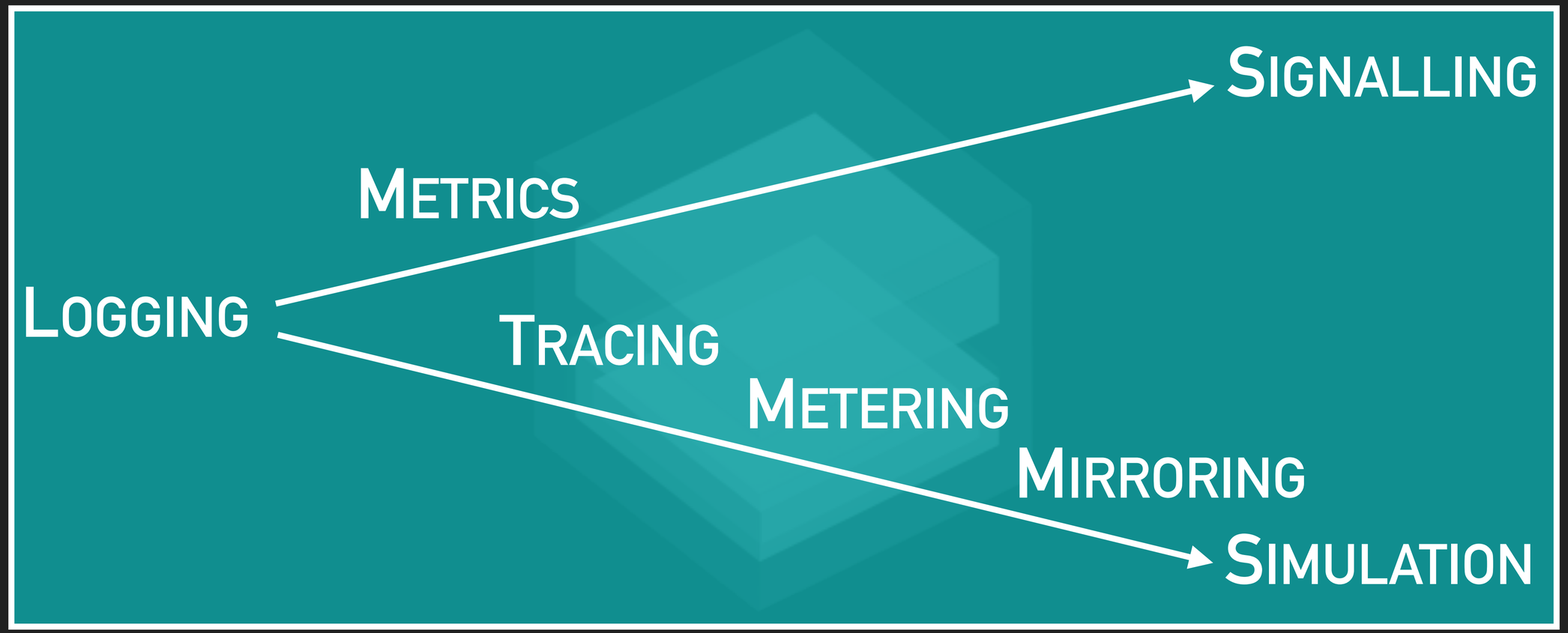
Operability

Visualizations

Learning

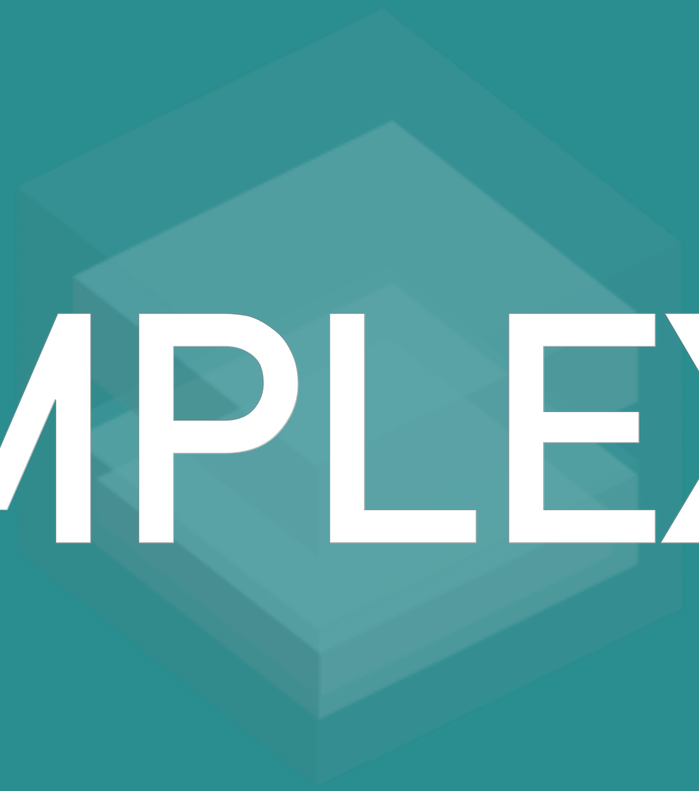
Intelligence

Operational · Effectiveness · DevOps · Human



Reconstruction · Explorative · Developer · Machine

Complexity



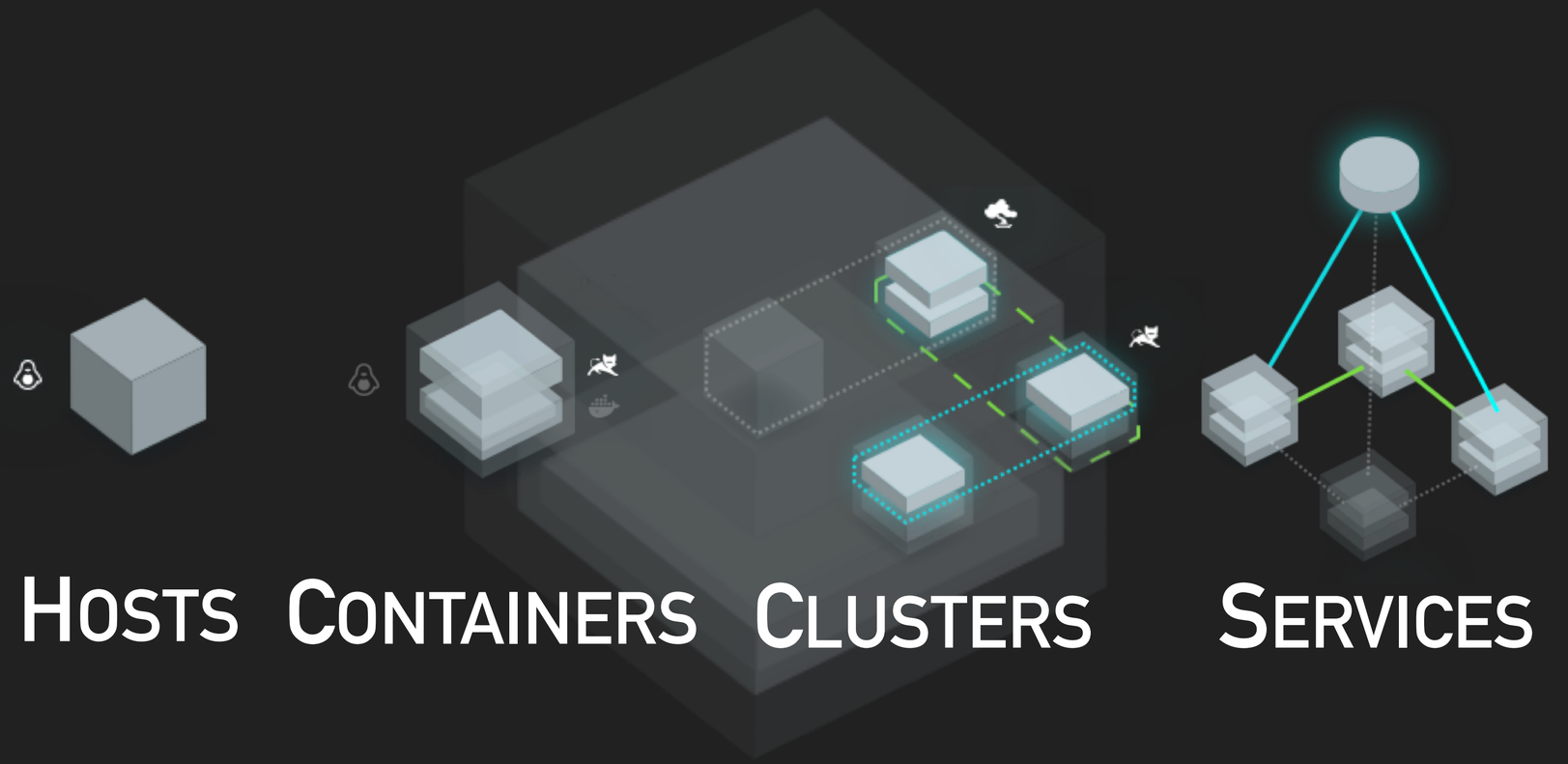
Complex Systems

Dense Networks

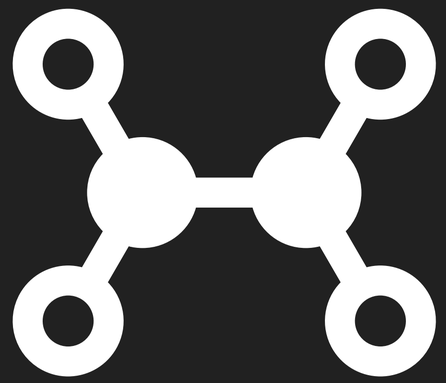
Adaptive Agents

Multiple Scales

Dynamics States

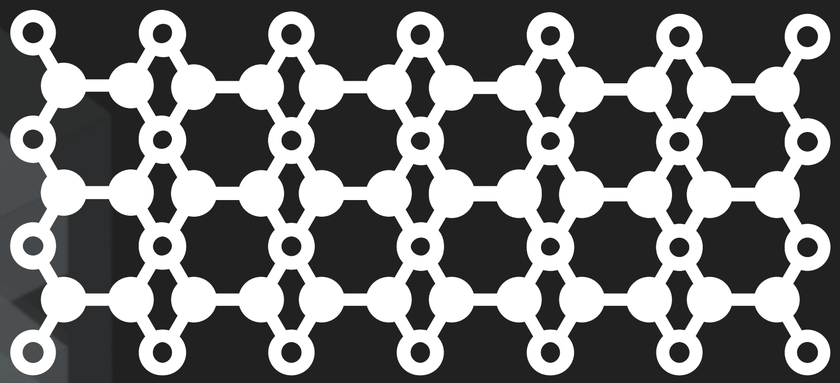


HOSTS CONTAINERS CLUSTERS SERVICES



MONOLITHS

MICROSERVICES



FLOWS & FUNCTIONS

Connectivity

+100 APIs

+1,000 Dependencies

+10,000 Flows

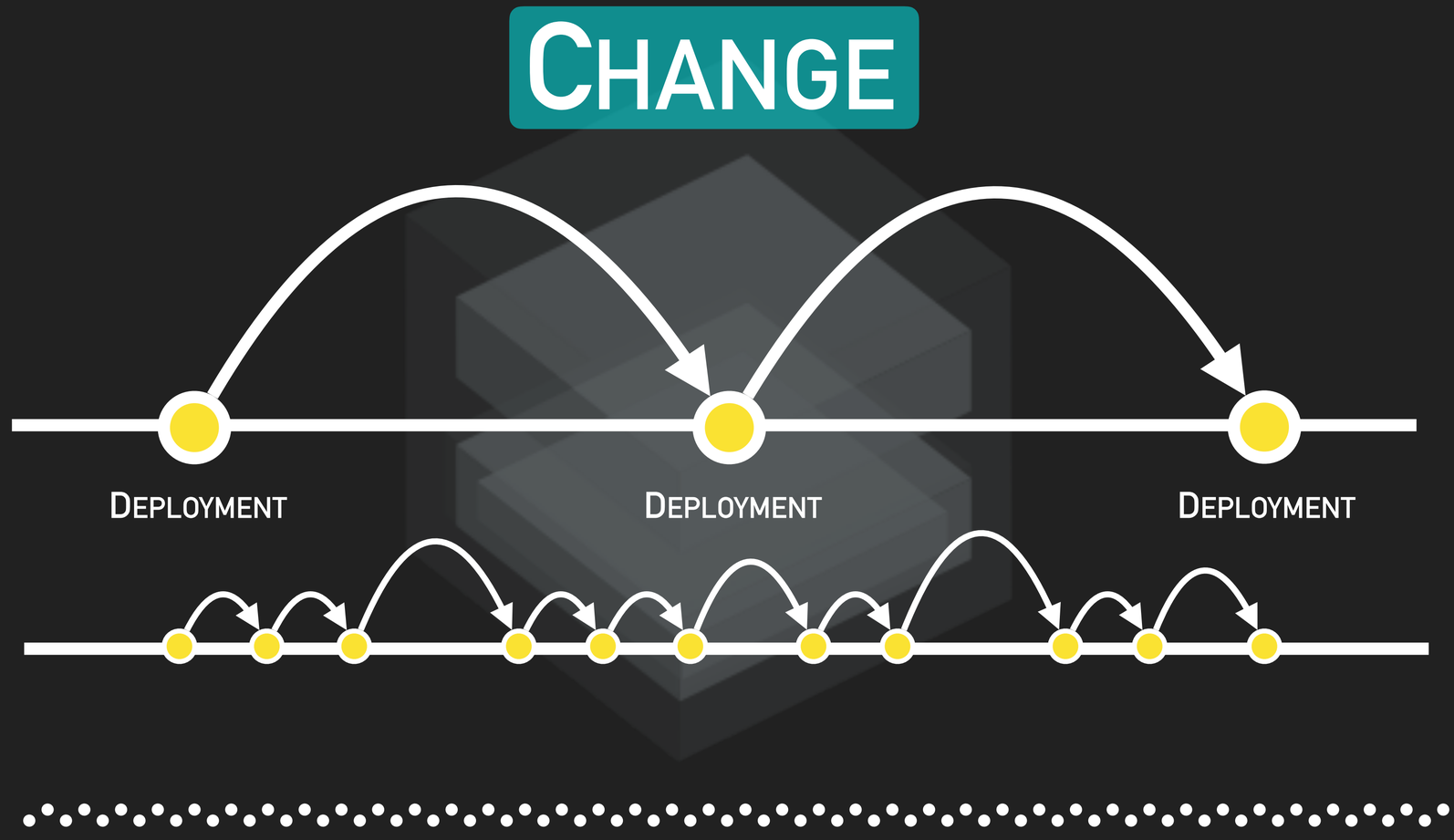
Cloud

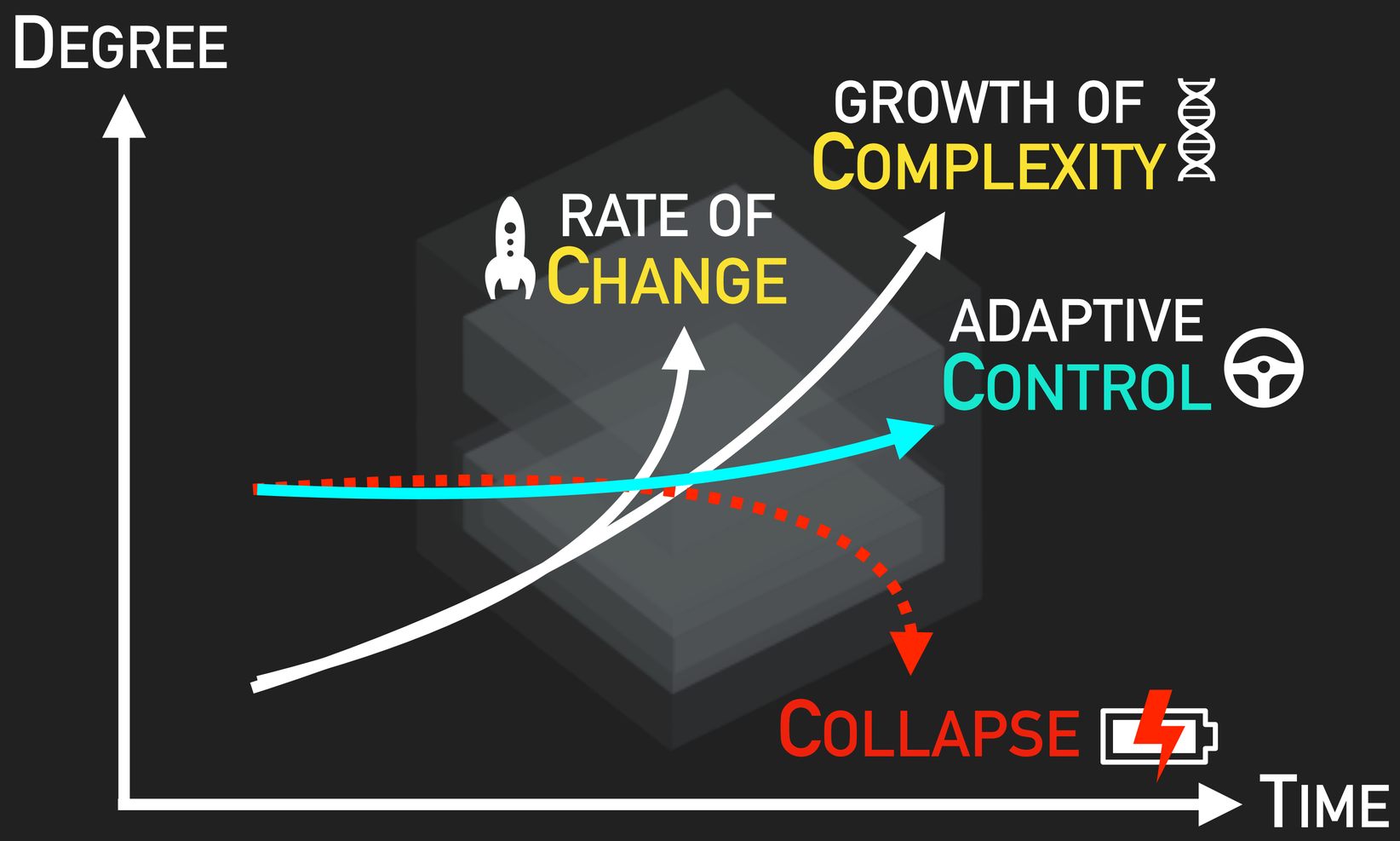
Self Service

Large Network Access

Pooling & Elasticity

Metered Service

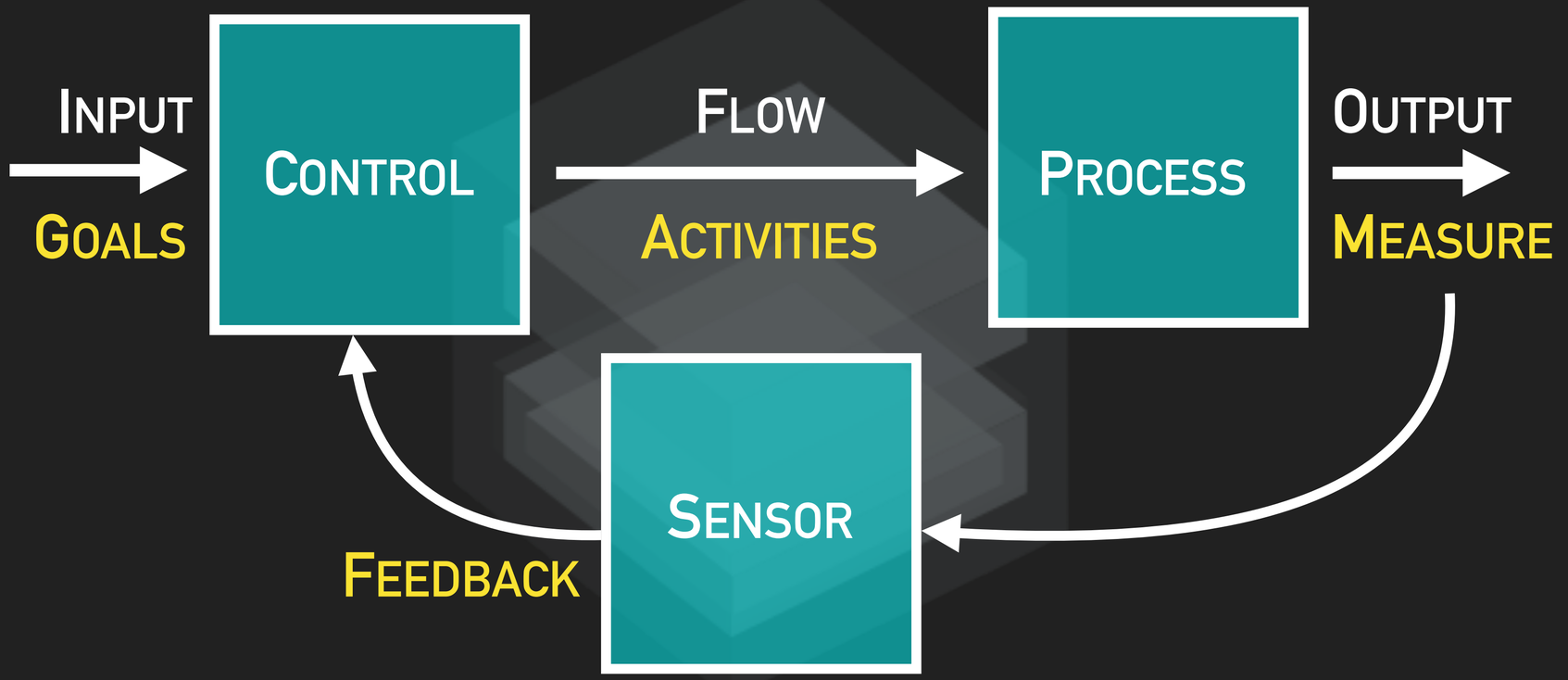

CHANGE
DEPLOYMENT
DEPLOYMENT
DEPLOYMENT

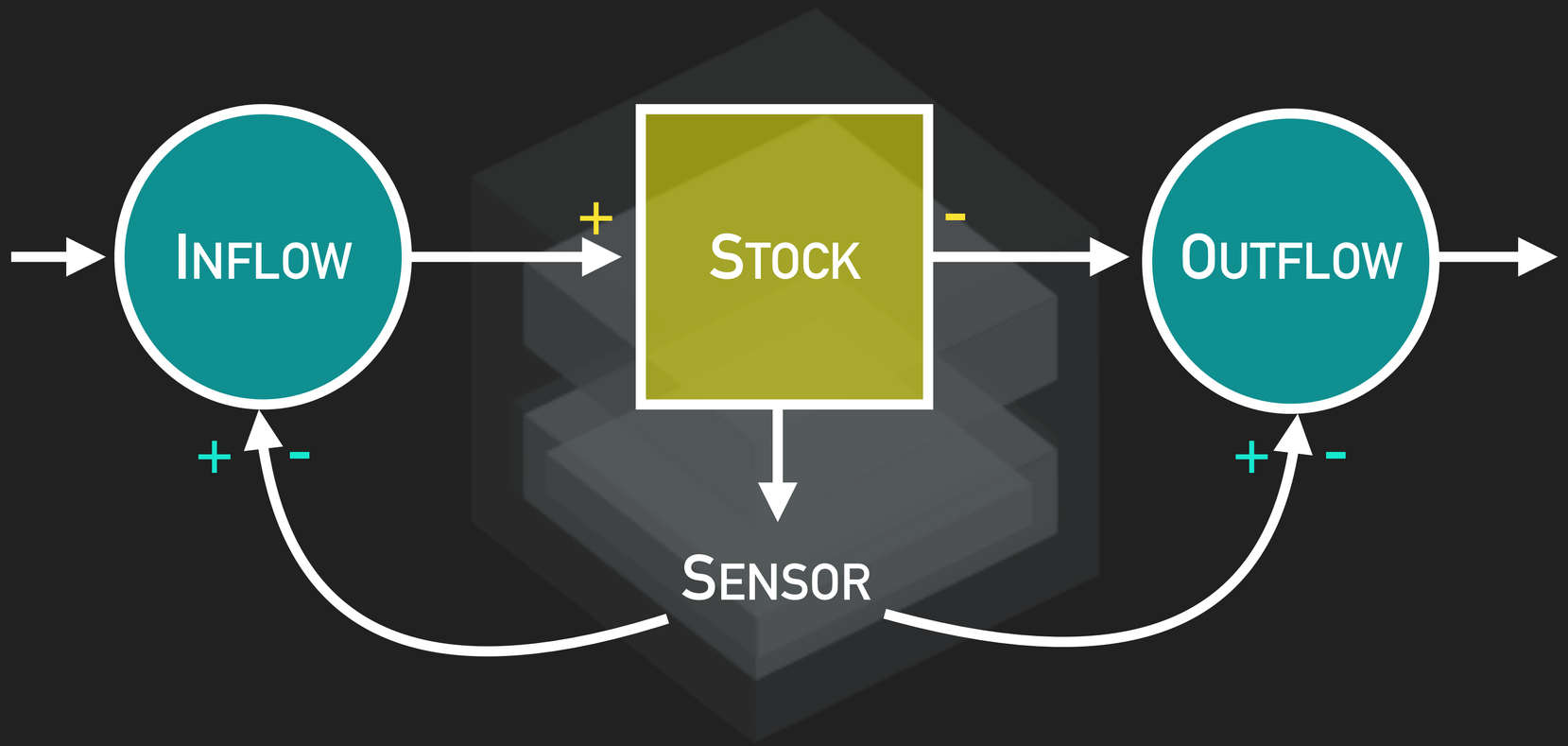

DEGREE
GROWTH OF
COMPLEXITY
RATE OF
CHANGE
ADAPTIVE
CONTROL
COLLAPSE
TIME

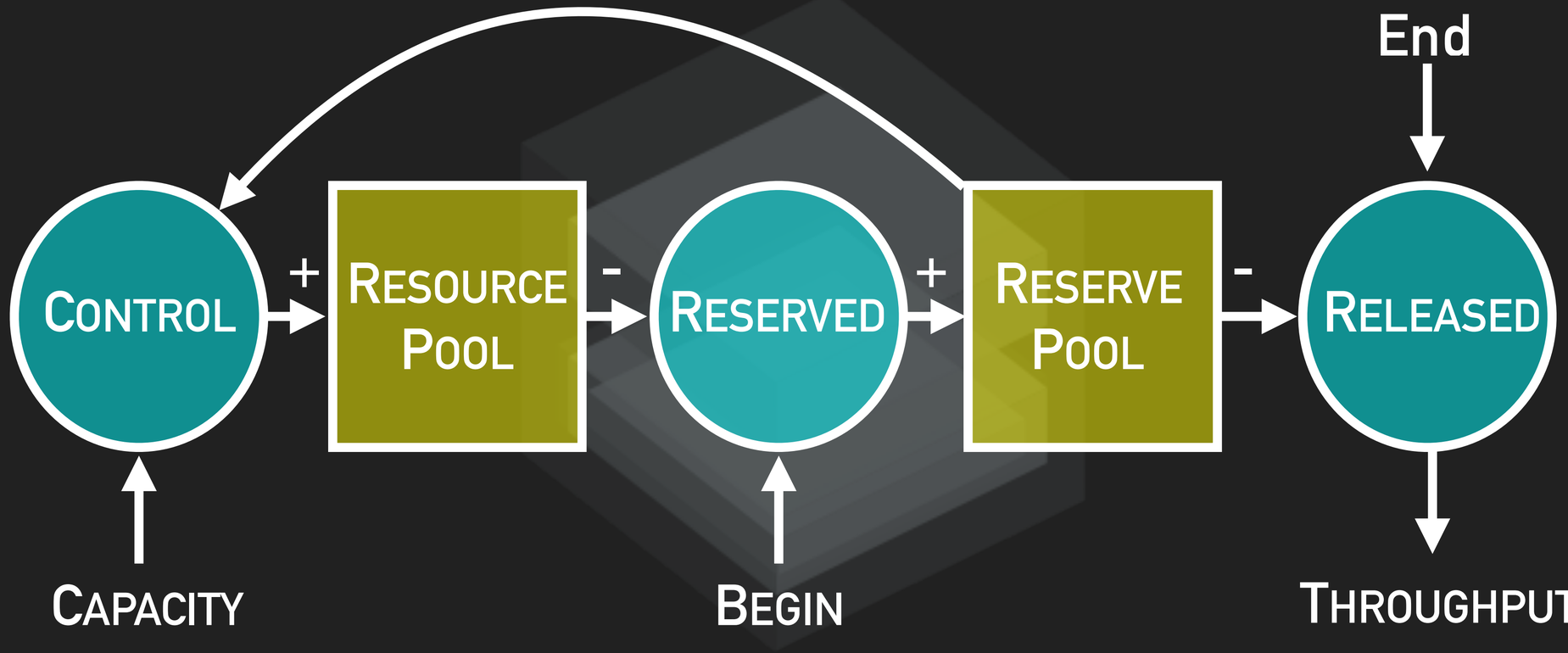
CYBERNETICS

Cybernetics

the Scientific
study of Control
and Communication
in the Animal and
the Machine


Input
Goals
Control
Flow
Activities
Process
Output
Measure
Sensor
Feedback


Inflow
+
Stock
-
Outflow
+
-
+
-
Sensor


End
Control
+
Resource Pool
-
Reserved
+
Reserve Pool
-
Released
Capacity
Begin
Throughput

Cybernetics

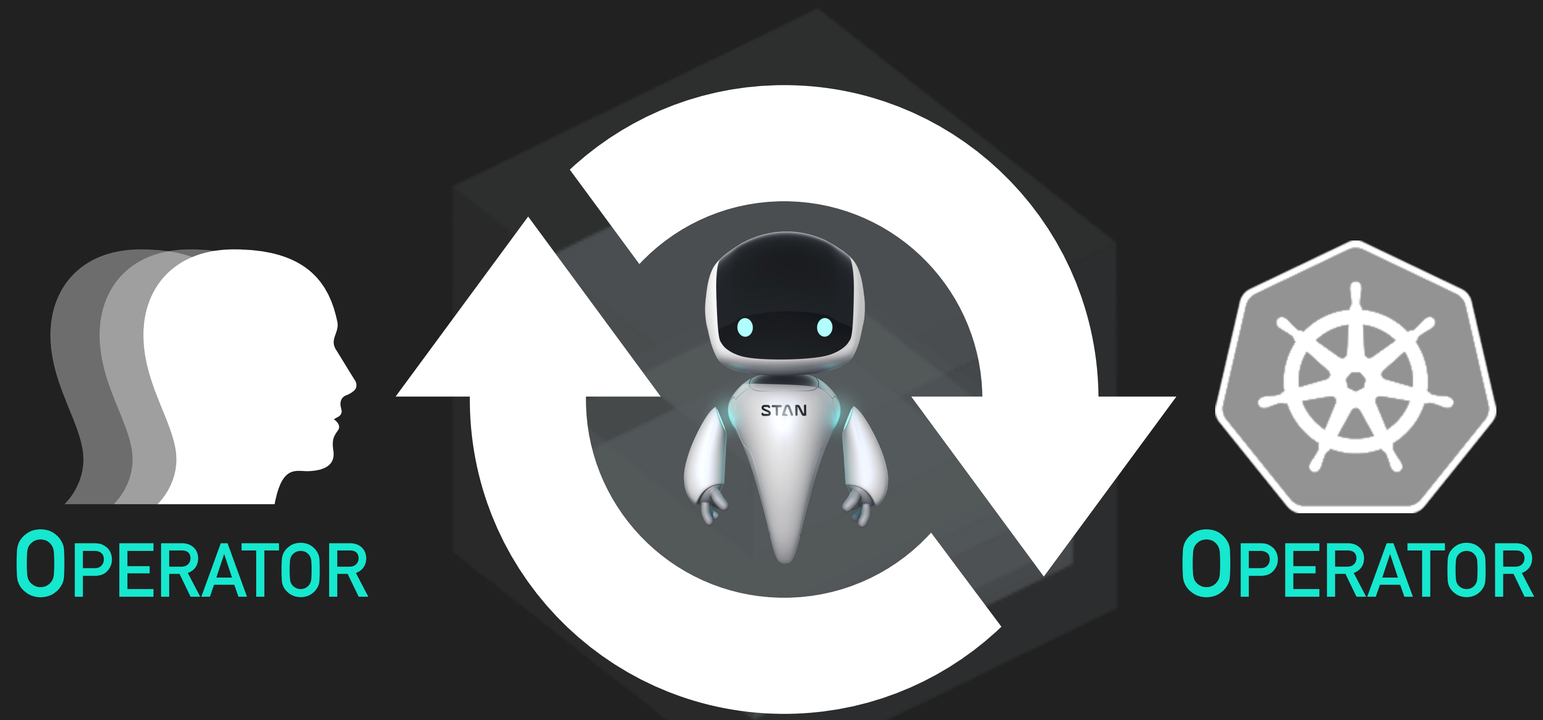
Feedback

Flow

Control

Communication


DevOps
Feedback
Flow
Control
Communication



OPERATOR

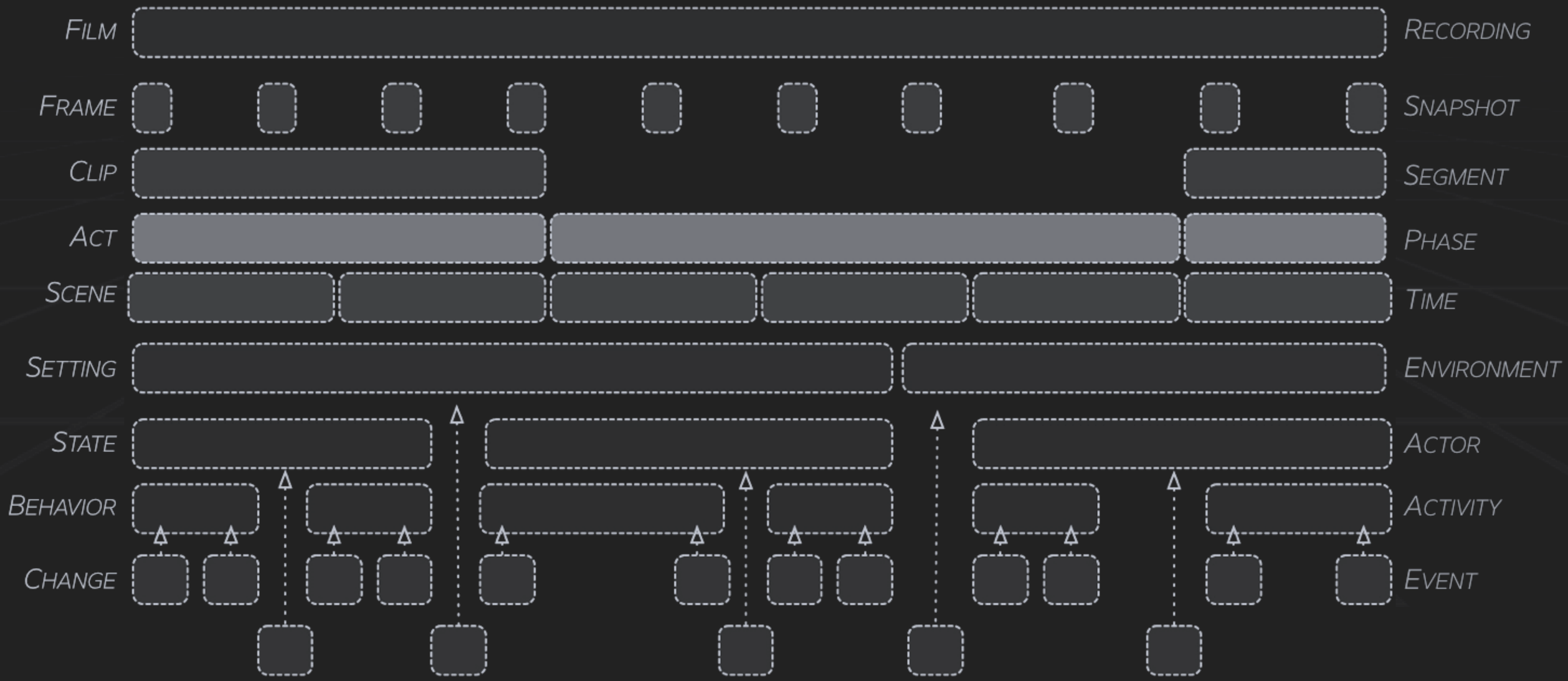
OPERATOR

CYBERNETICS

Intelligence is Action Appropriate to Context

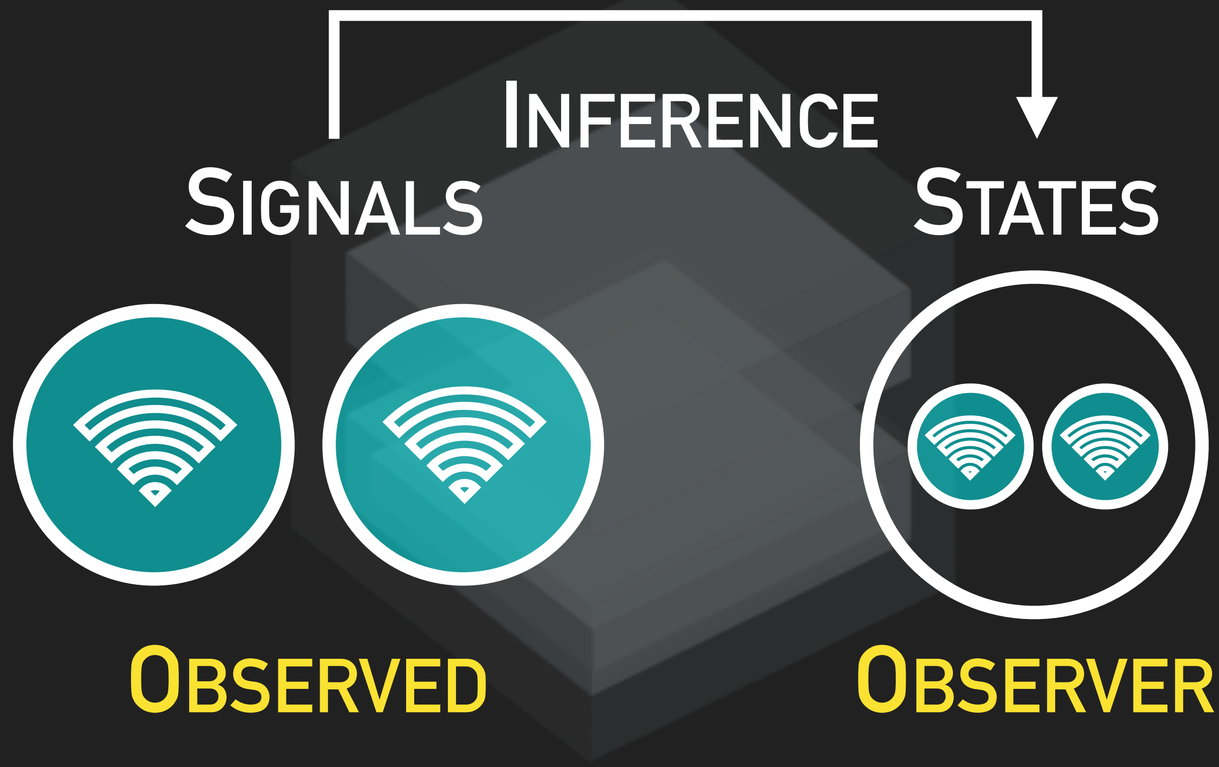
Context

Context is the Circumstances that Form the Setting for an Event

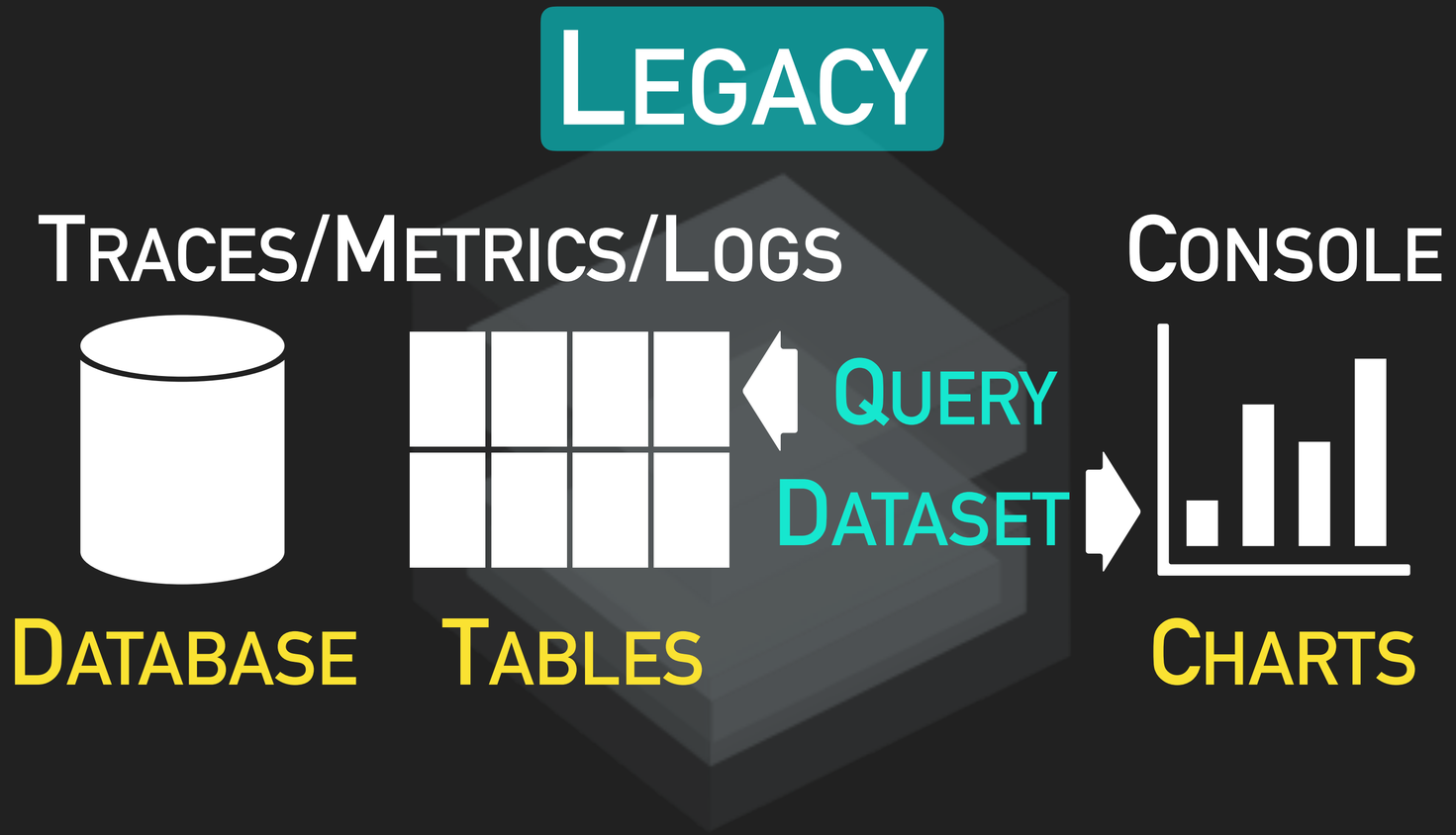

Film
Recording
Frame
Snapshot
Clip
Segment
Act
Phase
Scene
Time
Setting
Environment
State
Actor
Behavior
Activity
Change
Event

Observability

The Inference of Internal States of a System from Knowledge of its External Outputs

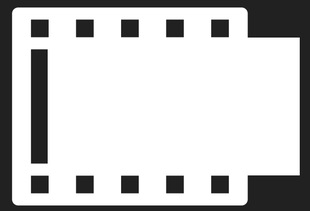

Inference
Signals
States
Observed
Observer

LEGACY


TRACES/METRICS/LOGS
CONSOLE
QUERY
DATASET
DATABASE
TABLES
CHARTS

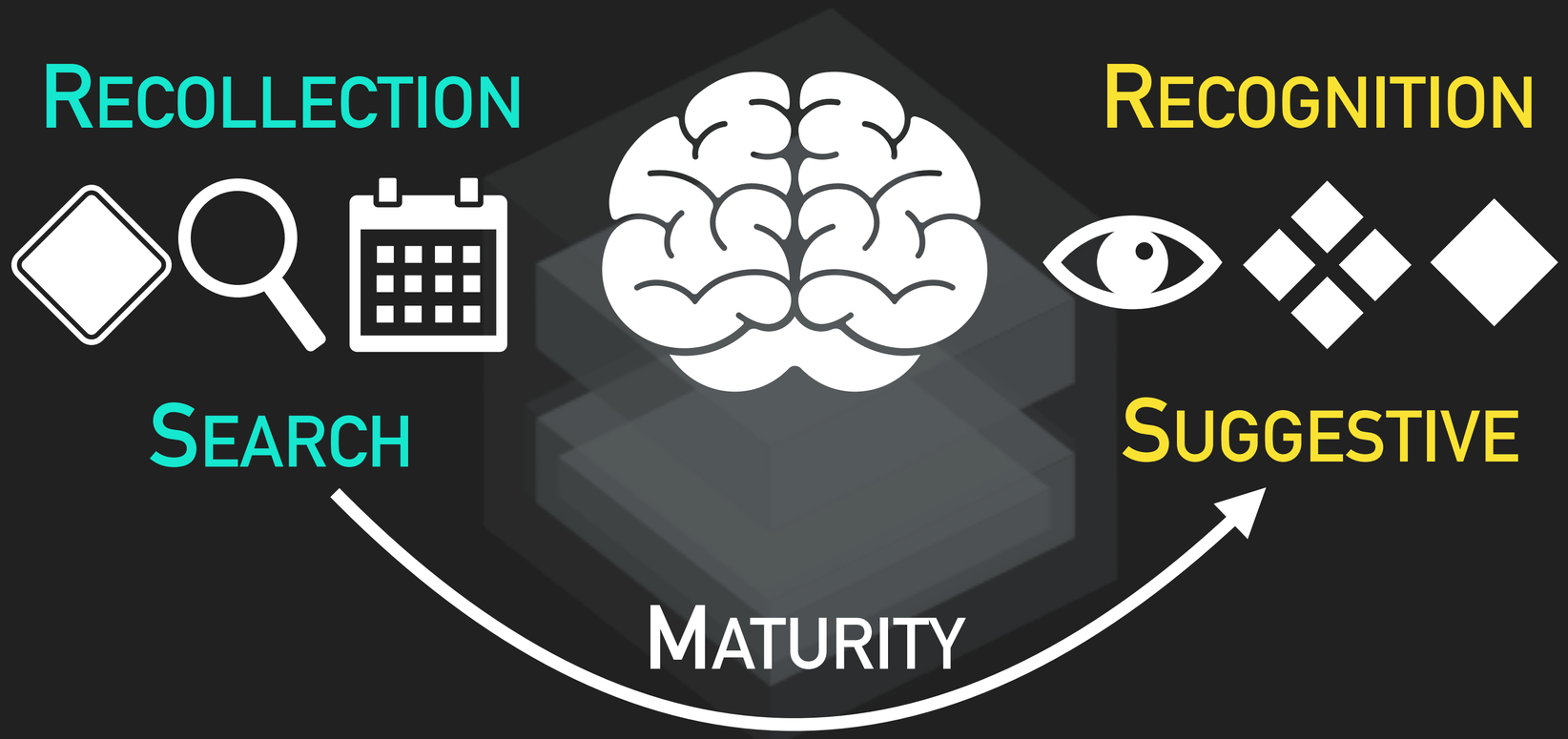
Modern

Sensors Agents Services Status



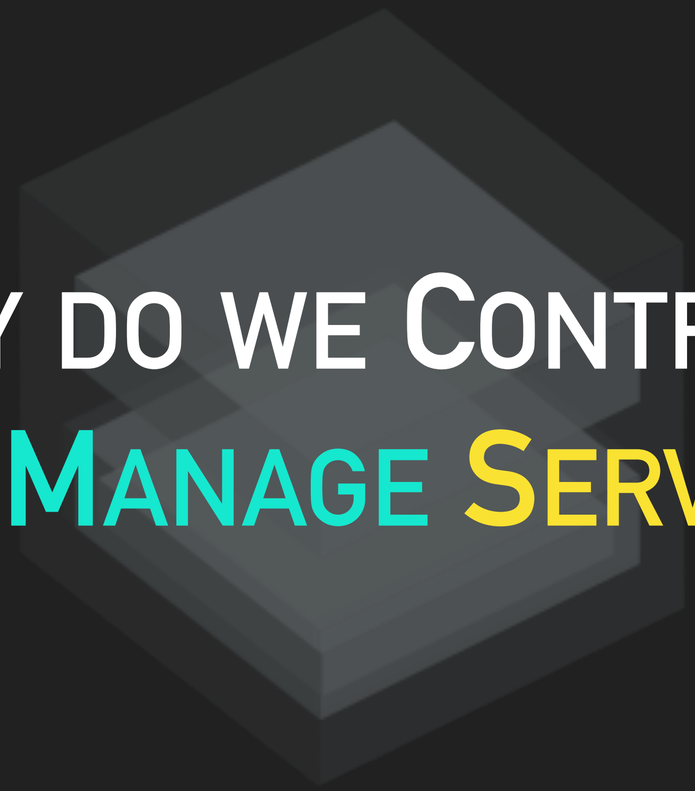
Fusion

Collections Channels Changes Signals


RECOLLECTION
RECOGNITION
SEARCH
SUGGESTIVE
MATURITY

Why do we Observe?
To Monitor Signals

Why do we Monitor?
To Control States

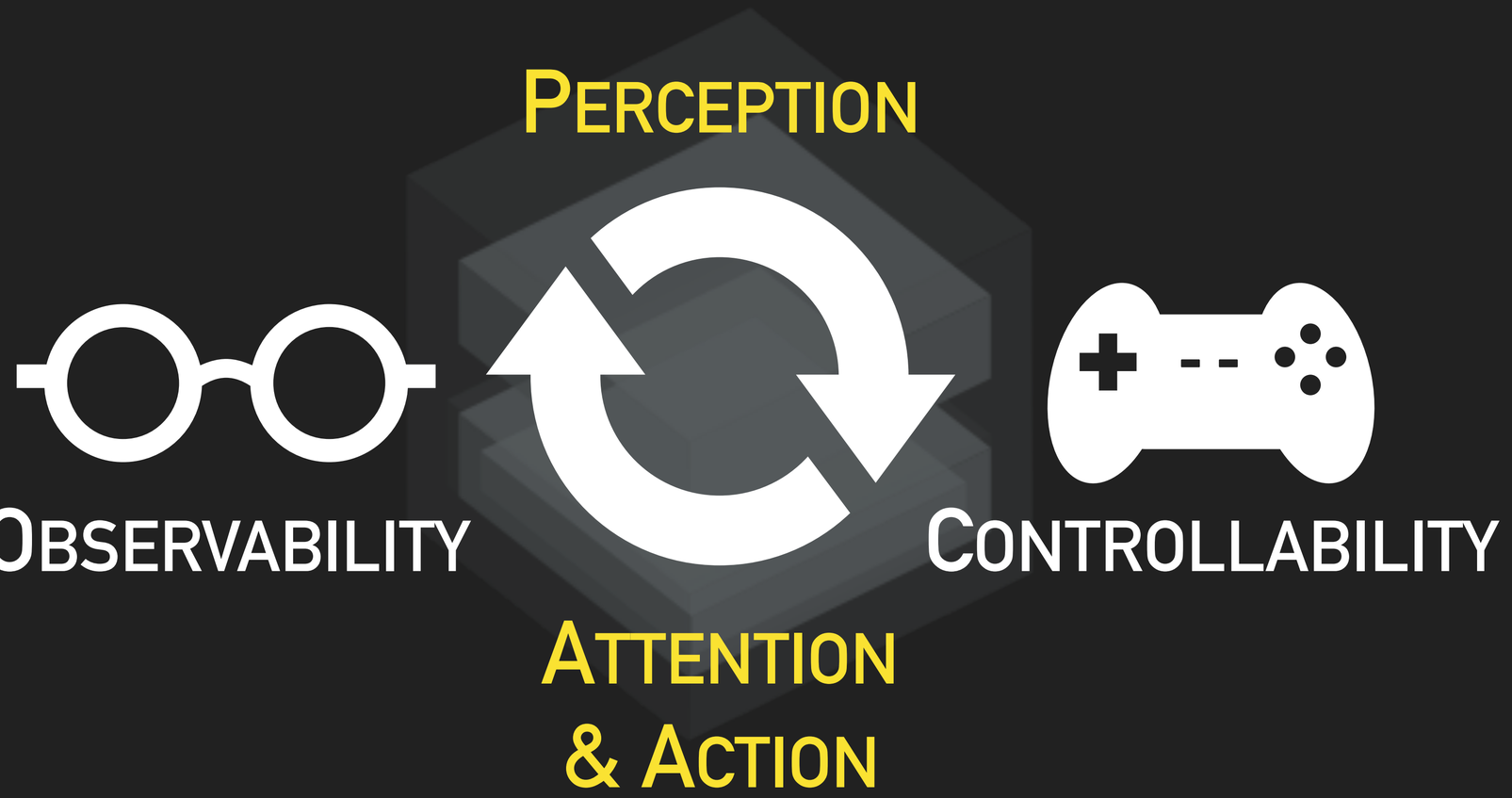


Why do we Control?
To Manage Service


CONTROL

Controllability

The Power to Influence or Direct Behavior or the Course of Events


Perception
Observability
Controllability
Attention
& Action

Monitoring

Steers Observability

Directs Attention

Integrates Senses

Reconstructs Memories

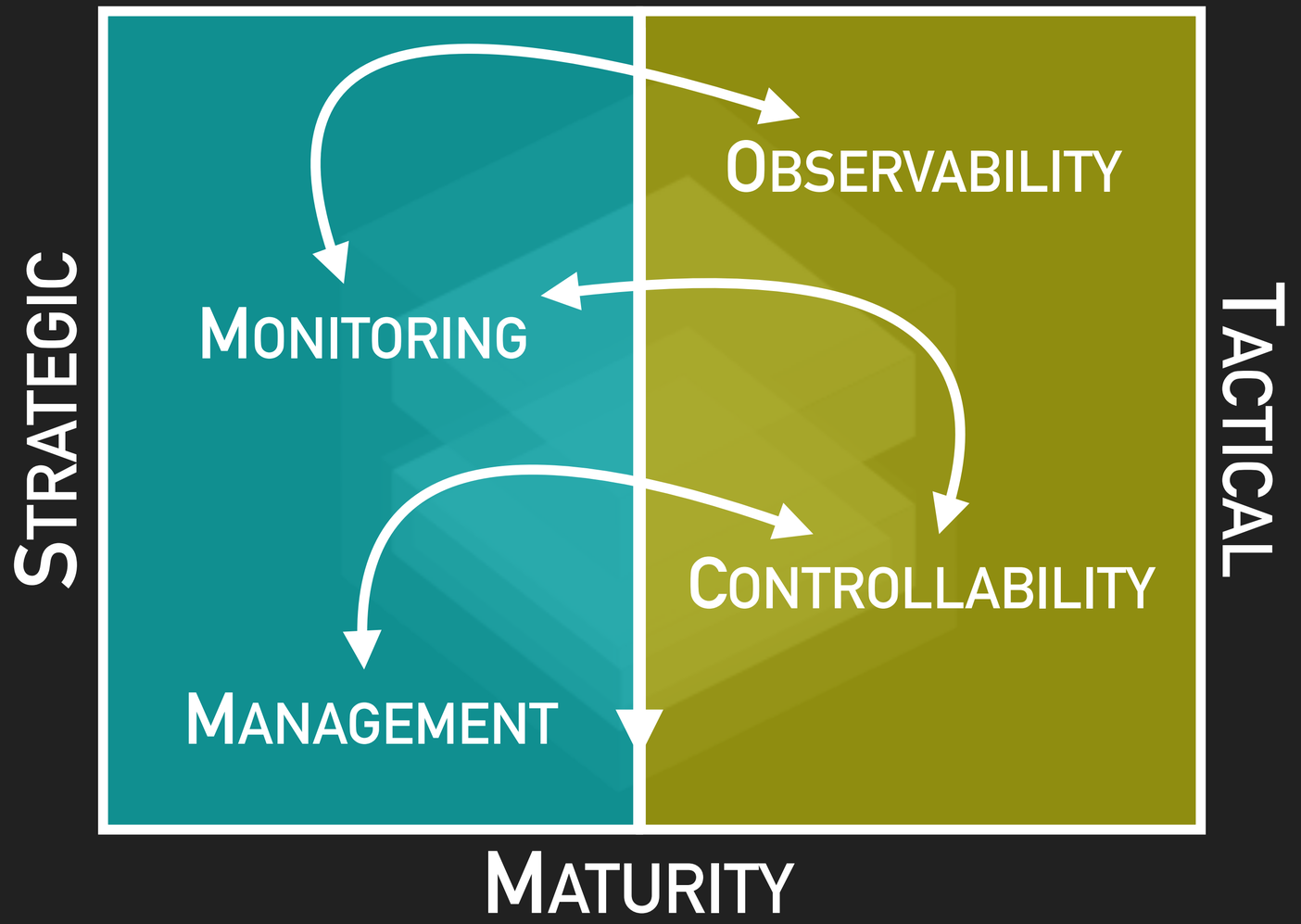
Monitoring

Identifies Patterns

Assigns Significance

Aids Reasoning

Guides Action


Observability
Monitoring
Controllability
Management
Strategic
Tactical
Maturity

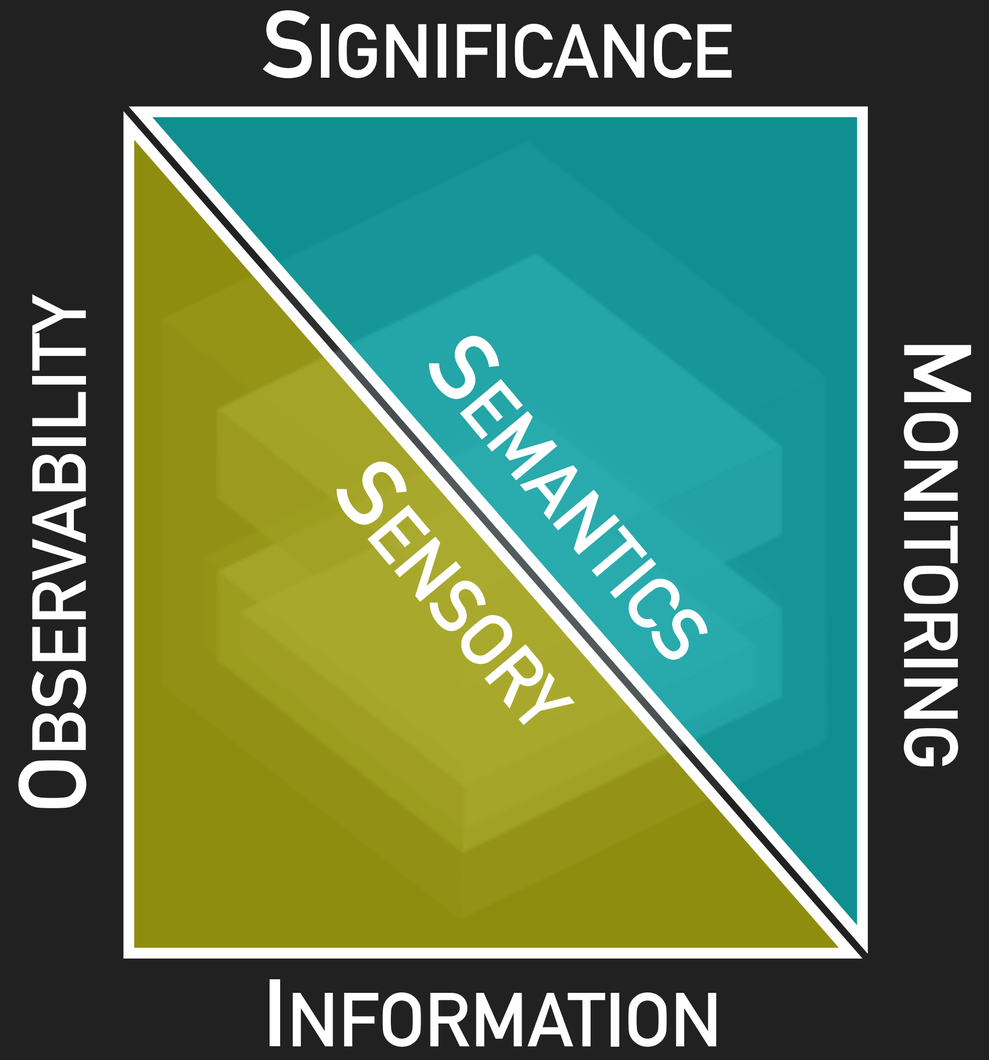
Colloquially

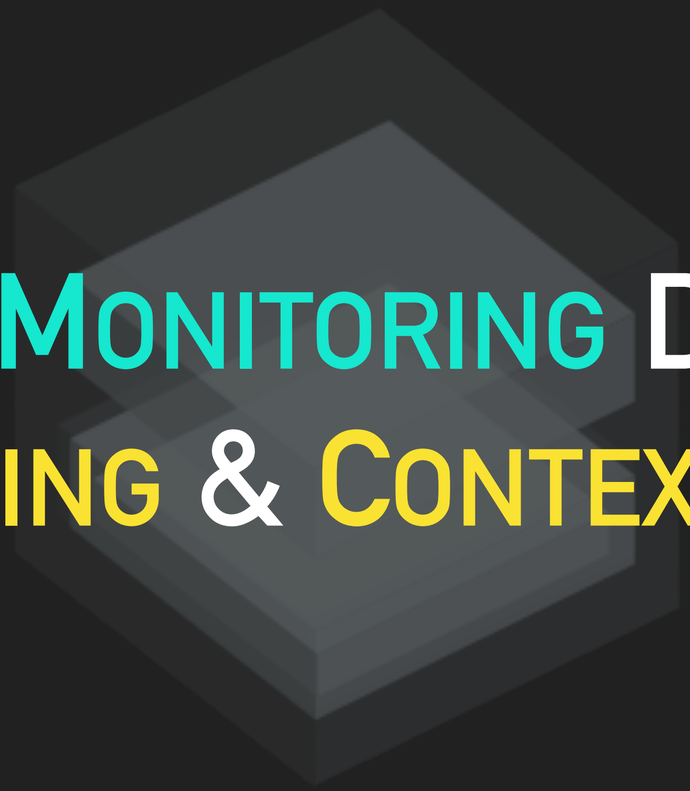
Observability is Looking

Monitoring is Seeing

Controllability is Acting

Management is Regulating


Significance
Observability
Monitoring
Information
Semantics
Sensory



Effective Monitoring Depends on Connecting & Contextualizing

CONTEXT

CHANGE

CONNECT

CONTROL


Cognition

Cognition

The Mental Process of Acquiring Knowledge and Understanding Through Thought, Experience, and the Senses

Social Cognition

How People Process, Store, and Apply Information about other People and Social Situations

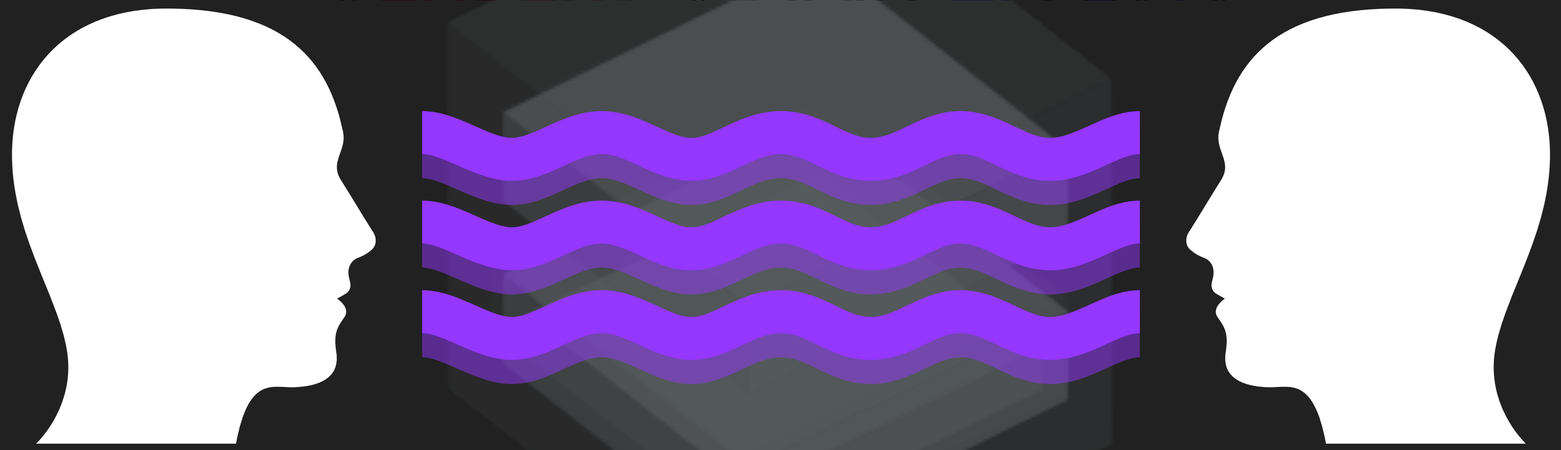
Service Cognition

How Services Process, Store, and Apply Information about other Services and System Contexts

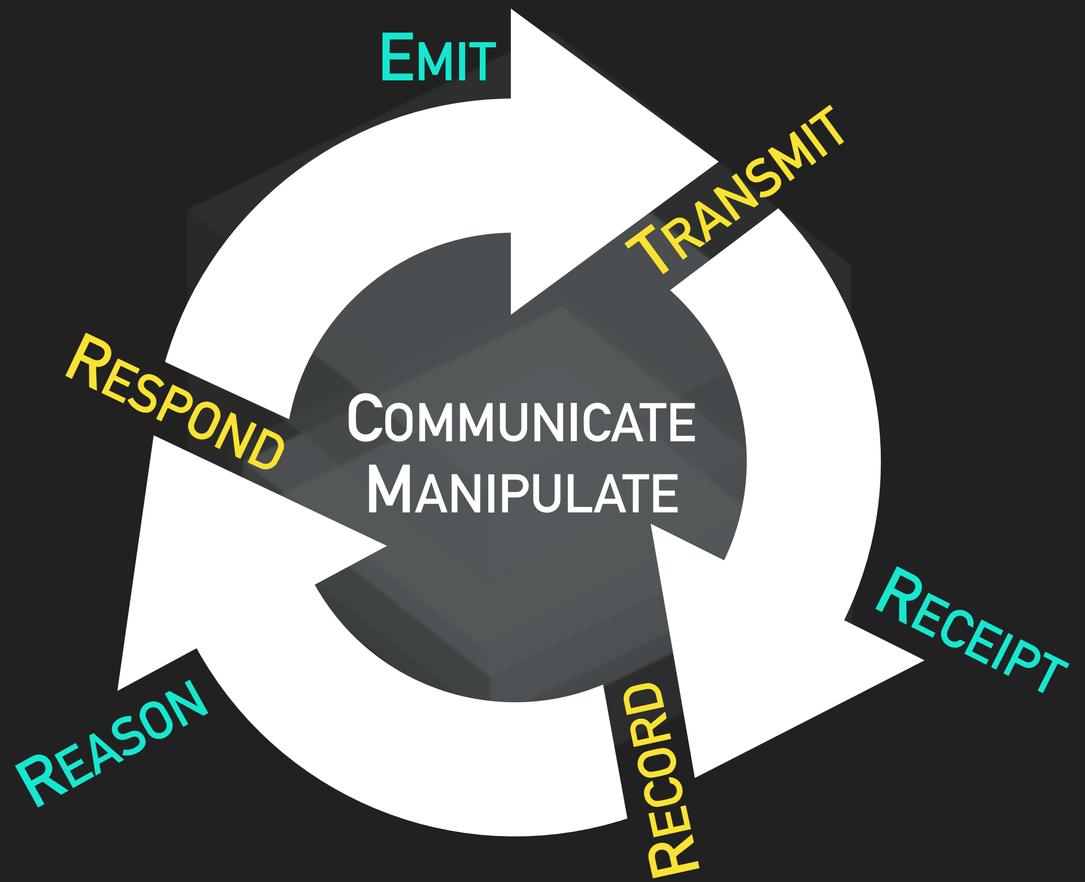
Signalling

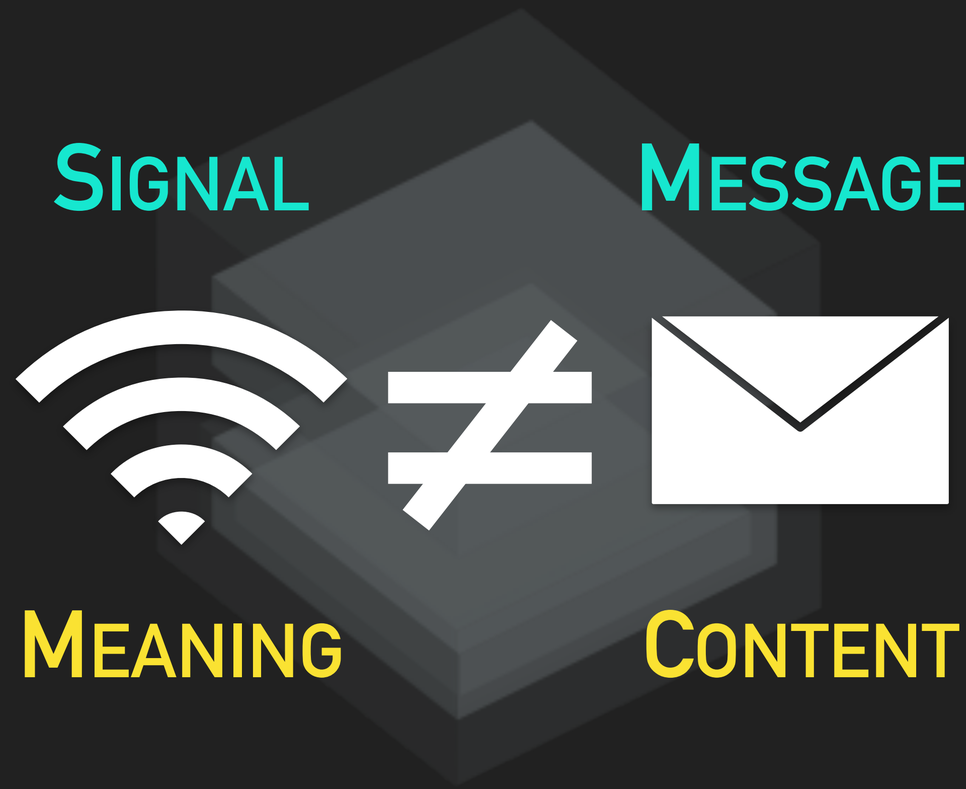
Signals Evolved to Convey Meaning and Influence Behavior of Receivers

SENDERS OBTAIN EFFECTS

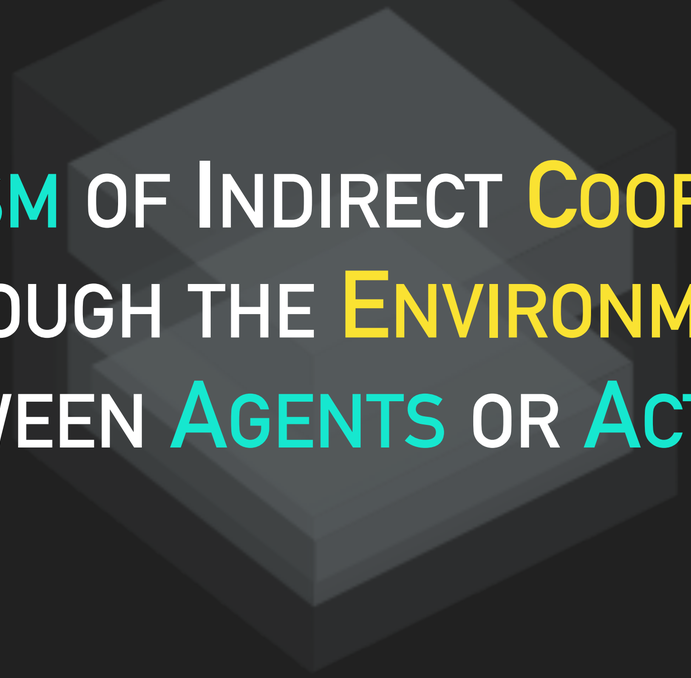


RECEIVERS OBTAIN INFORMATION


Emit
Transmit
Receipt
Record
Reason
Respond
Communicate
Manipulate

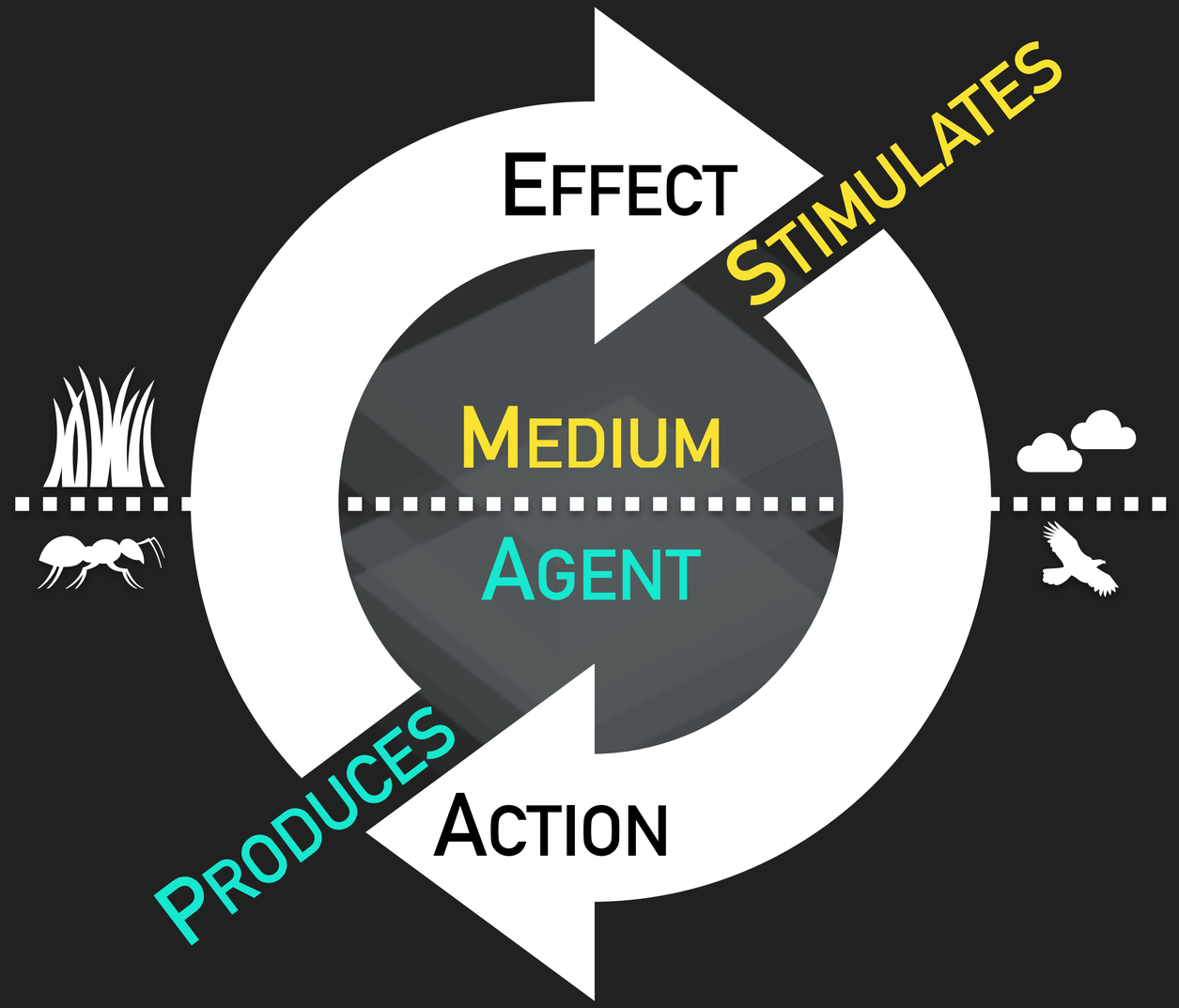

Signal
Message
≠
Meaning
Content

Stigmergy



Mechanism of Indirect Coordination,
Through the Environment,
Between Agents or Actions


Agent
Action
Sign
Signal
Environment
Medium

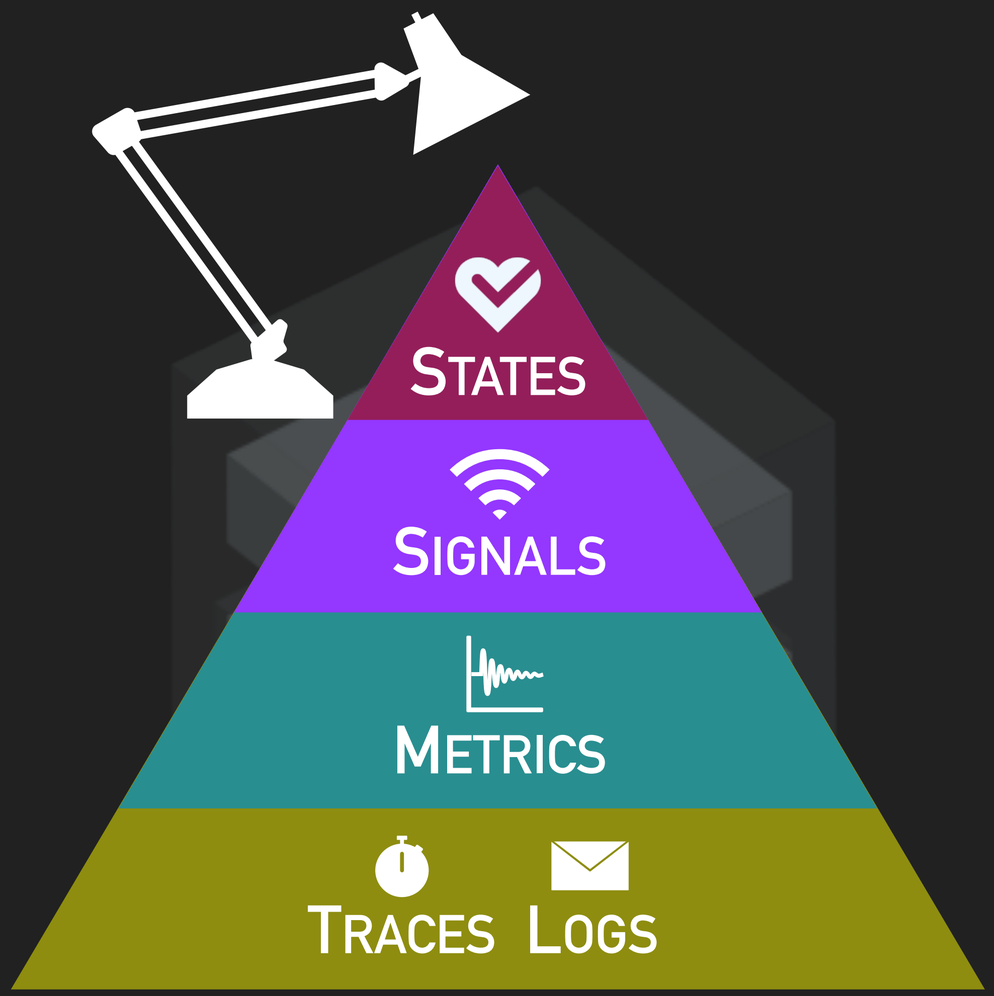

Effect
Stimulates
Medium
Agent
Produces
Action

Signify

Services
Systems

Resources
Schedulers

Contexts
Environments


States
Signals
Metrics
Traces
Logs