MODELWARDS 2026

The Rise of AI-Native Telcos: Reimaging Networks, Control, and Value in the Age of AI Agents

TELUS

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Telco Landscape

The New Reality - AI Agents & Multicloud Everywhere

Hardware construct

- Traditional Telco
  - Long-lived services
  - Loyal customers

Software construct

- SDN / NFV / Multicloud era
  - On-demand
  - Customers diversify

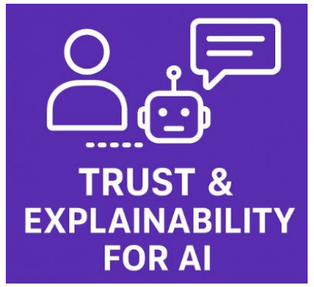
Data construct

- AI agents
  - New Telco customers
  - Machine speed

Challenges

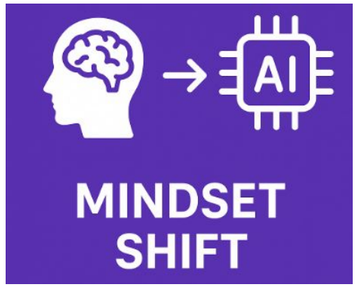
Trust: Explainability

- Familiar in Telco (CLI vs Model Driven)
- 360 observability → Situational awareness



Mindset Shift

- Mastering complexity



Reasoning

- Hallucination
- Orphan Agents
- Intent Verification

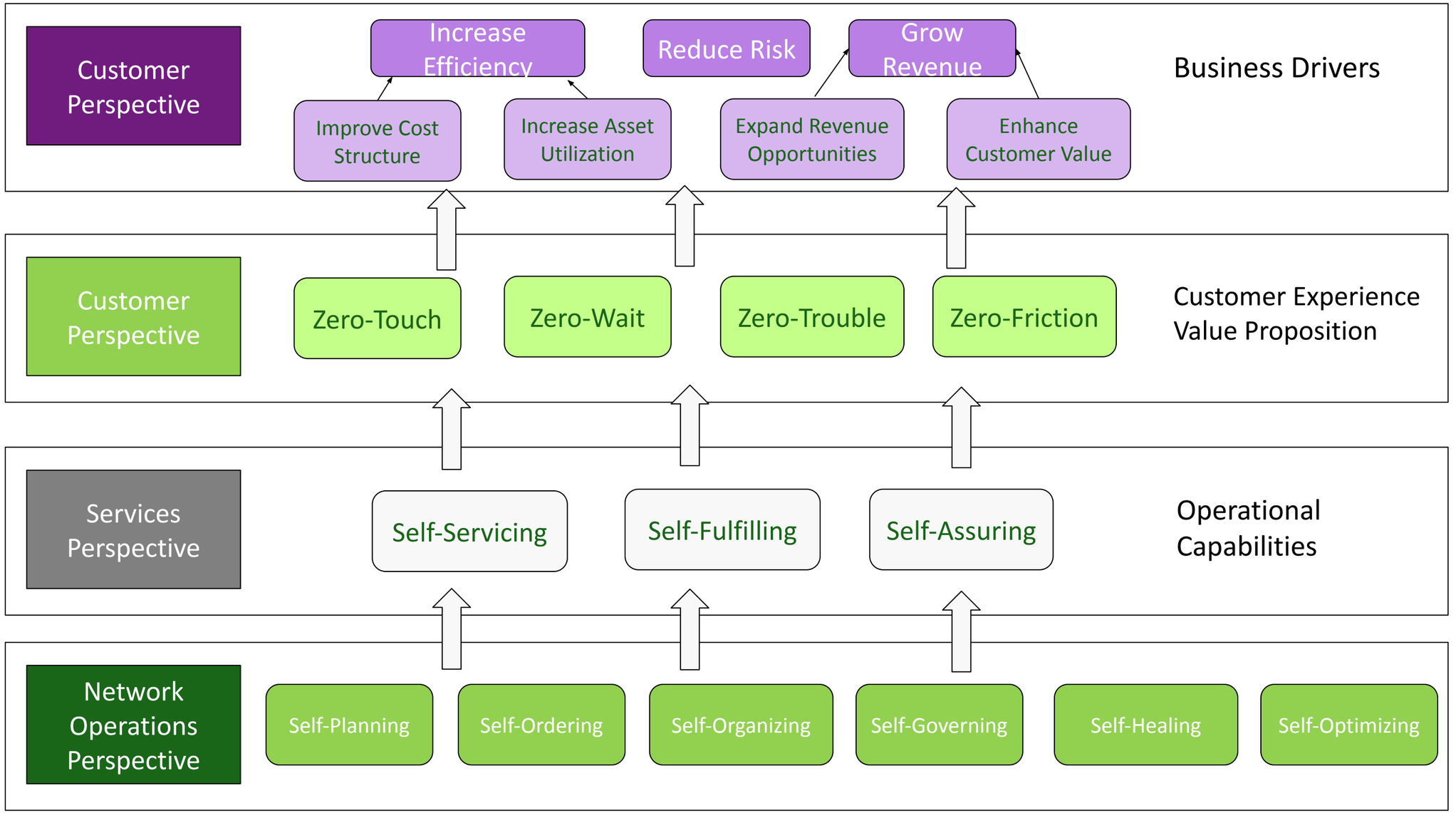
Telco concerns and standards

- Example: A2A

Agent Portability

Autonomous Networks

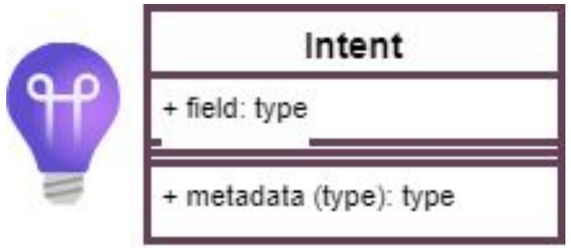
Objectives of Autonomous Networks (TMF)

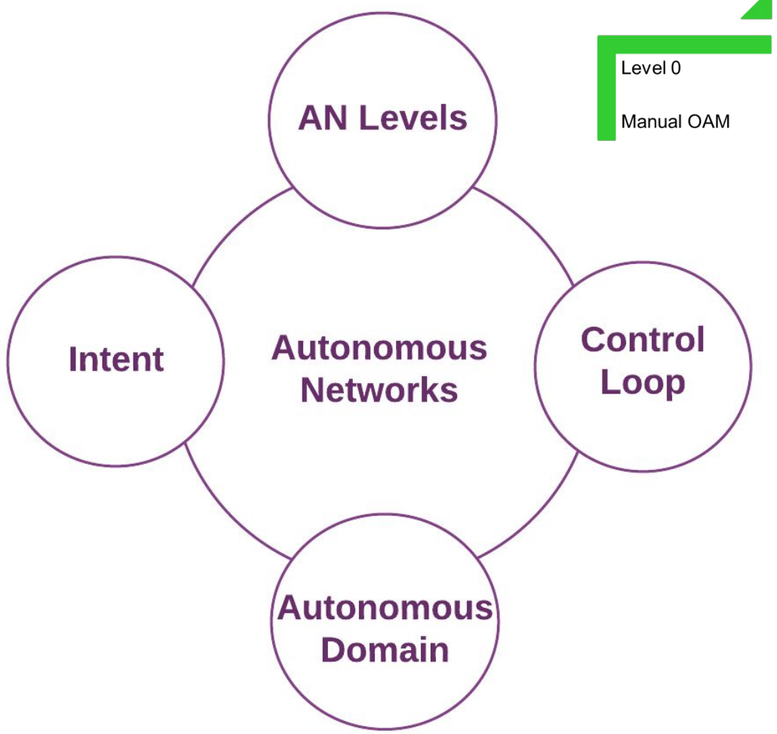


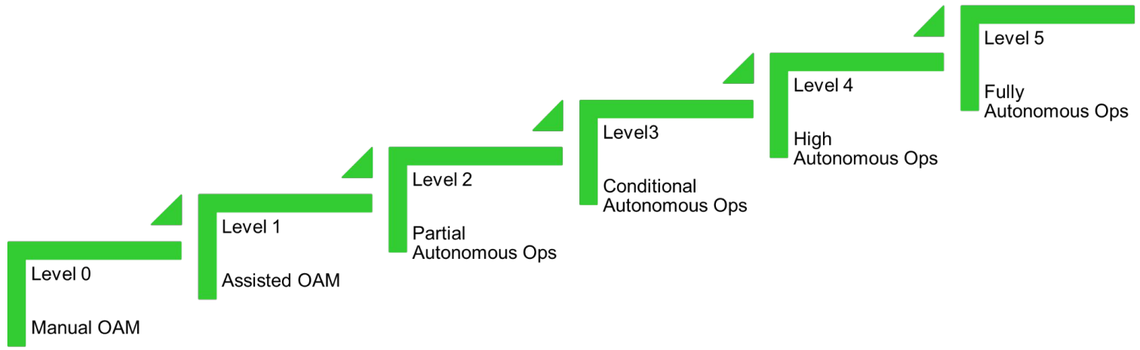
TMF Autonomous Networks Pillars

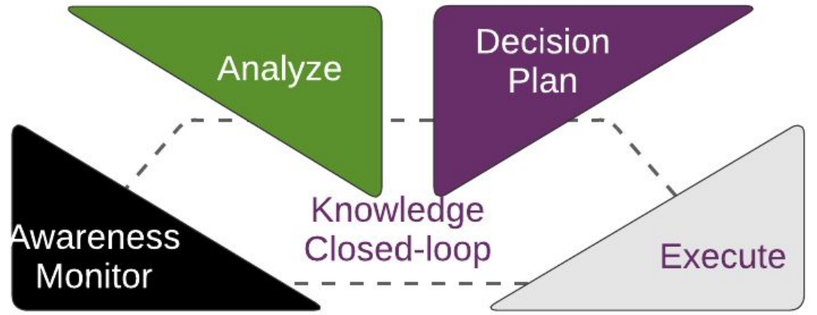
Intent

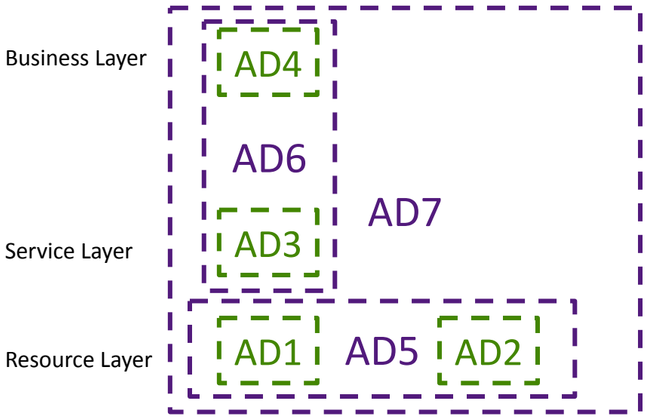
- Vendor agnostic
- Technology agnostic (where possible)

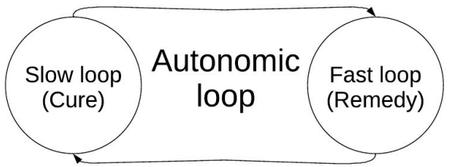


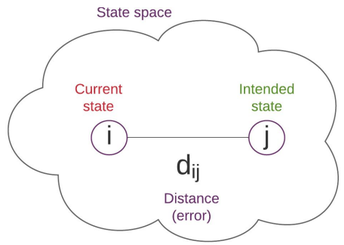








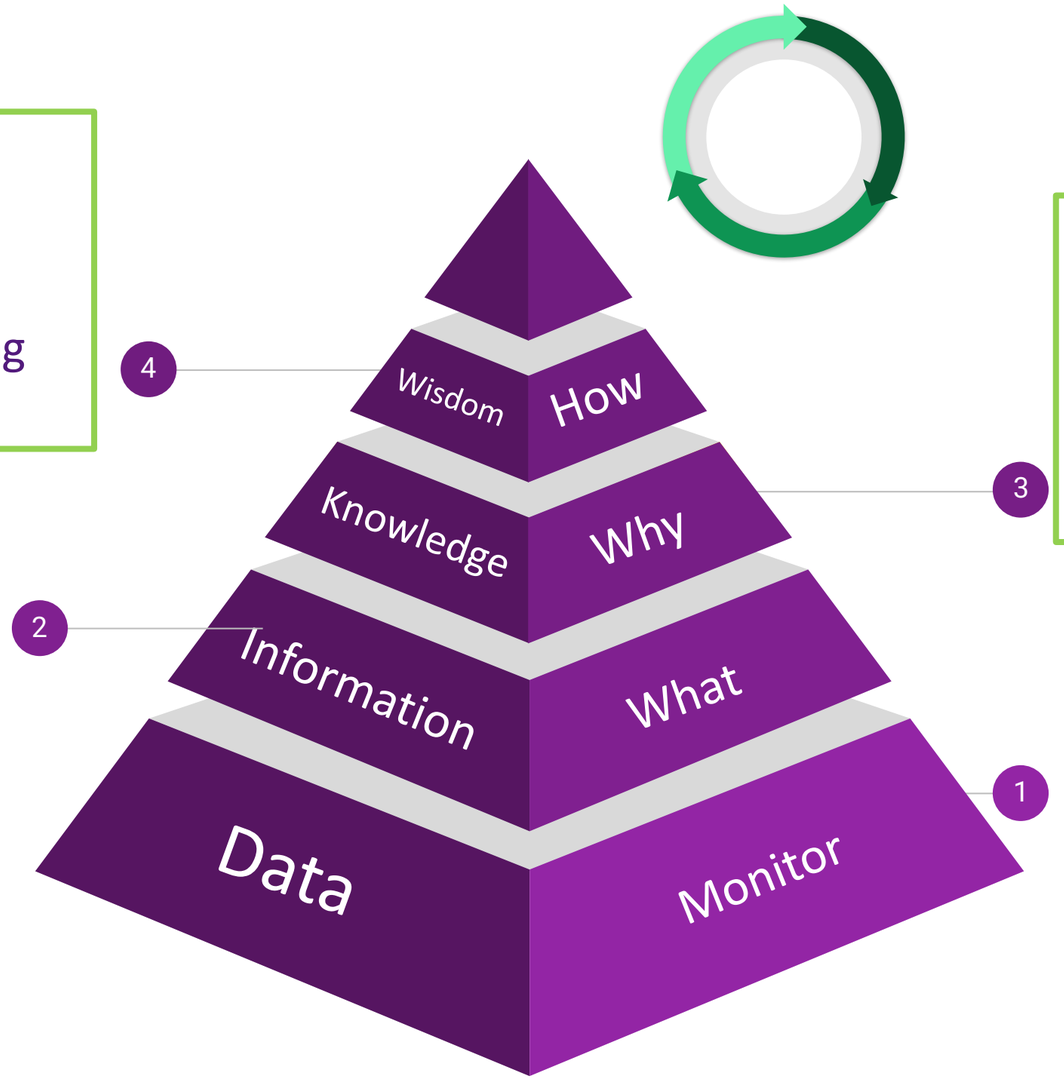




Journey towards Maturity - Data Oriented

- How to address?
  - Prescriptive AI
  - Reinforcement Learning
  - Automated Decision-Making
  - Optimal Action Generation

- What is happening?
  - Anomaly Detection
  - Event Correlation
  - Contextualization
  - Pattern Detection



- Why is this happening?
  - Root Cause Analysis
  - Causal AI
  - Knowledge Graphs
  - Pattern Recognition

- Monitor Data
  - Telemetry
  - Logs & Metrics
  - Alarms & Events
  - Network Traces
  - Configuration Data
  - Customer Experience

AIOps and TMF AN maturity levels

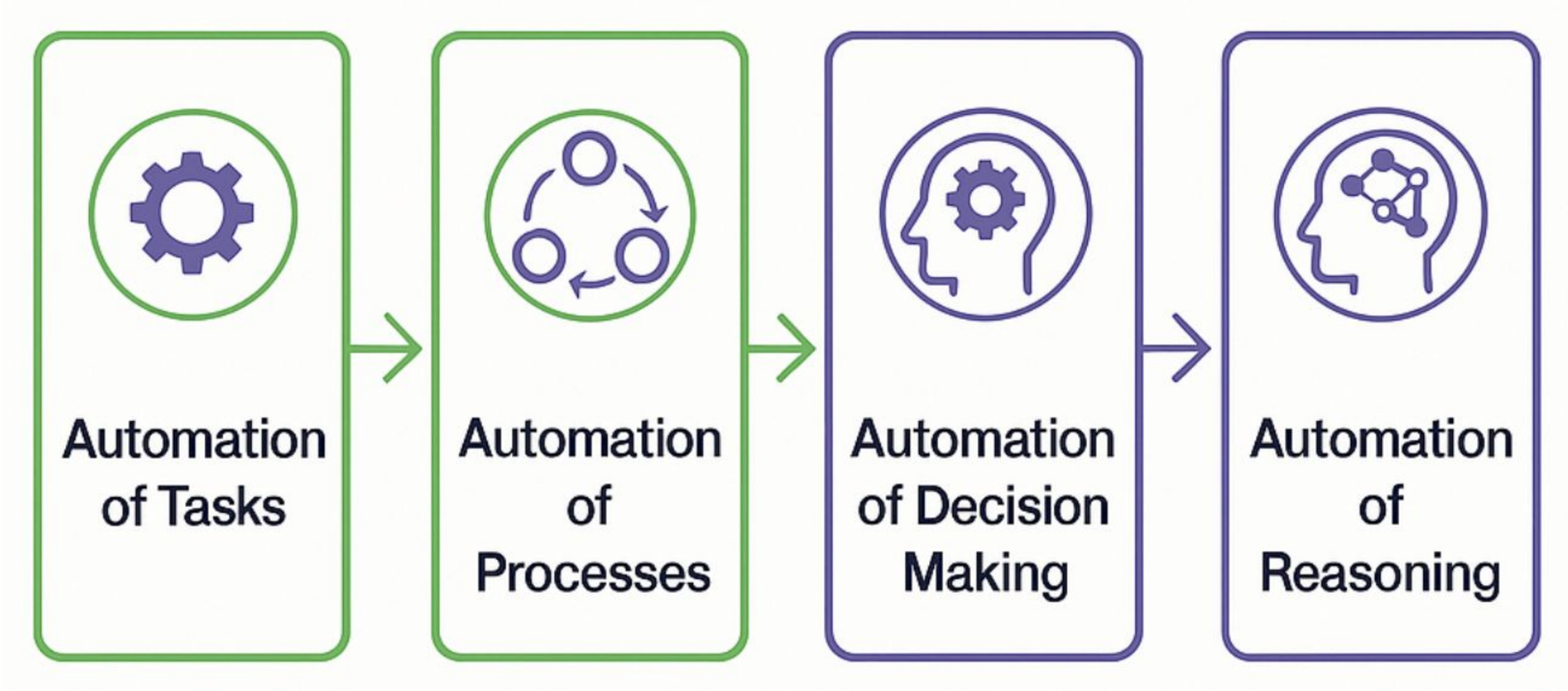
P: Personnel **S**: Systems

Level definition	L0: Manual operation and maintenance	L1: Assisted operation and maintenance	L2: Partial autonomous network	L3: Conditional autonomous network	L4: High autonomous network	L5: Full autonomous network
Execution	P	P/S	S	S	S	S
Awareness	P	P	P/S	S	S	S
Analysis	P	P	P	P/S	S	S
Decision	P	P	P	P/S	S	S
Intent/Experience	P	P	P	P	P/S	S
Applicability	N/A		Select scenarios			All scenarios

Journey towards Maturity - Functional - Role of AI

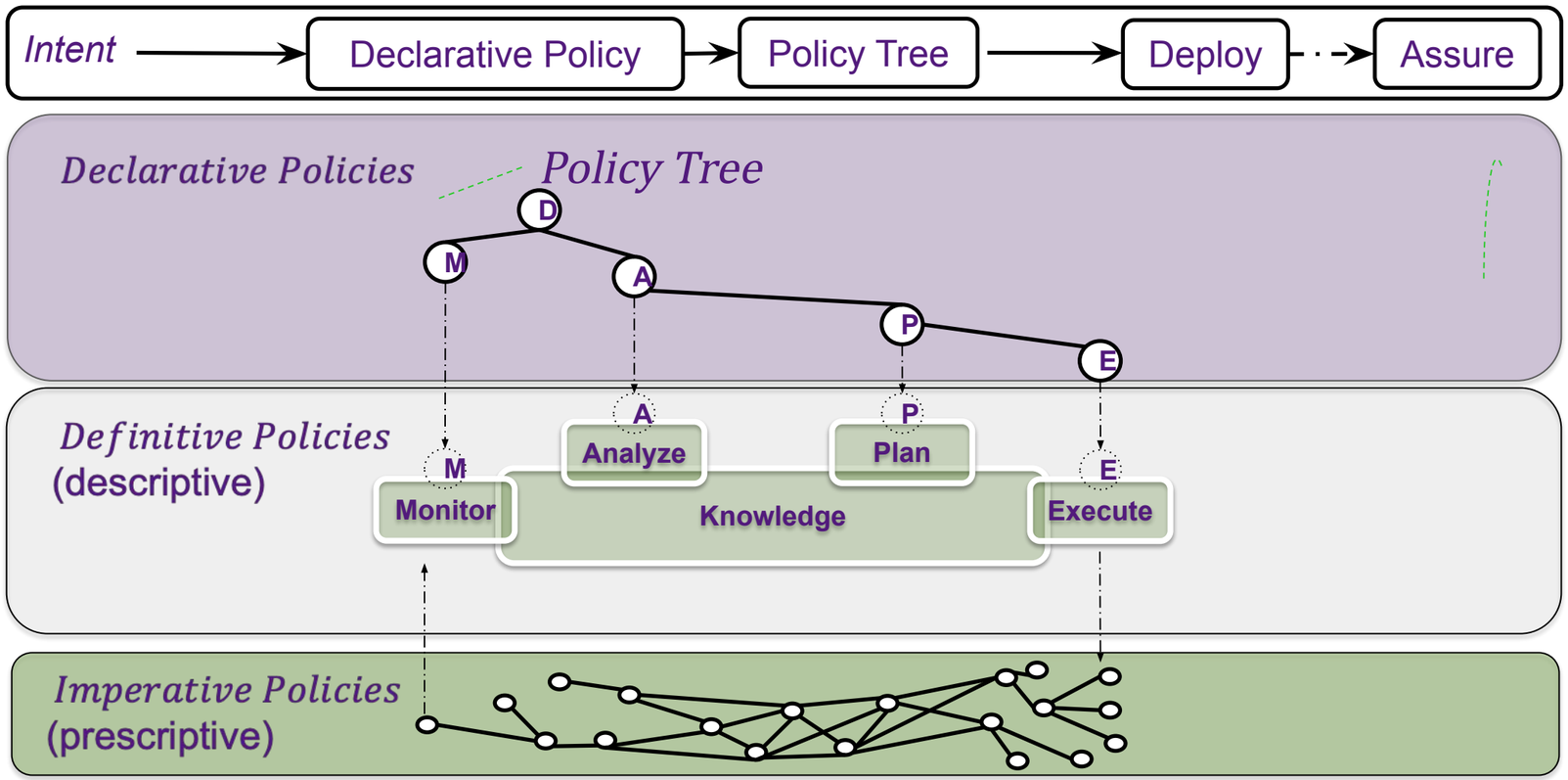
Evolution of Functionality Automation

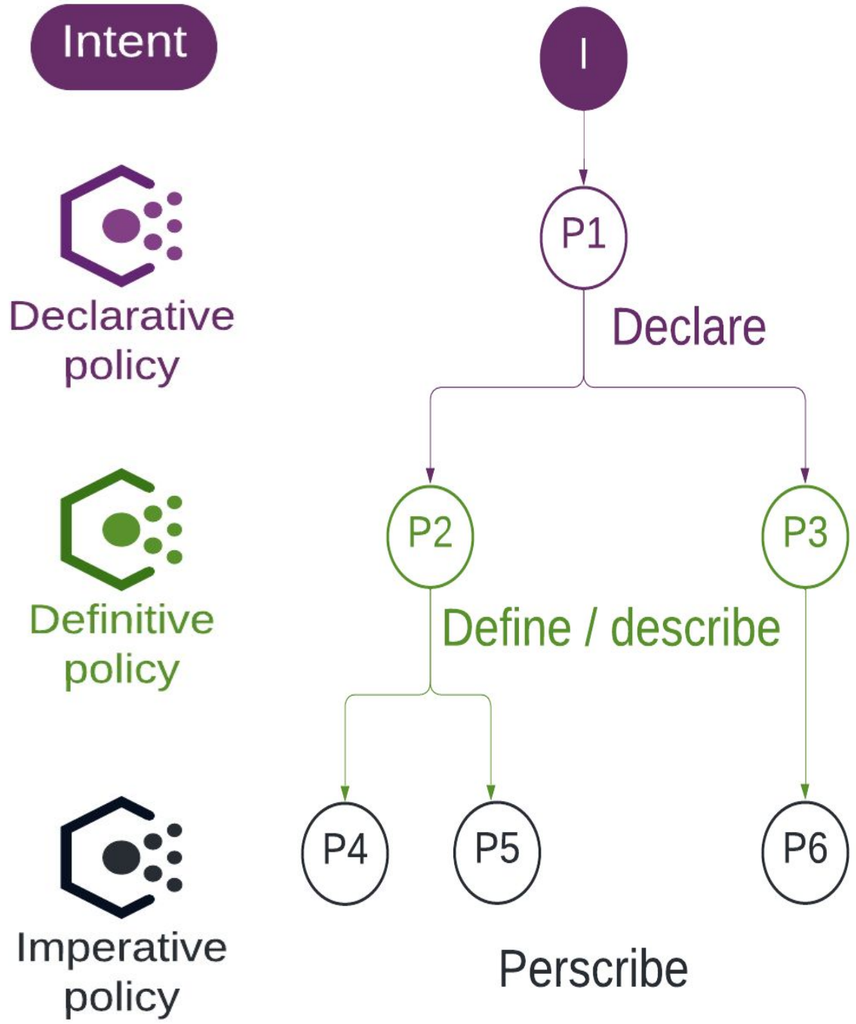
- AI for choice making
- AI for reasoning
- AI for proper closed-loop control



AI-Driven Choice Making

- Prescriptive functions/ policies in a pool
- Intent to formal declarative language
- Form policy trees
- Build execution workflows
- UofT collaboration

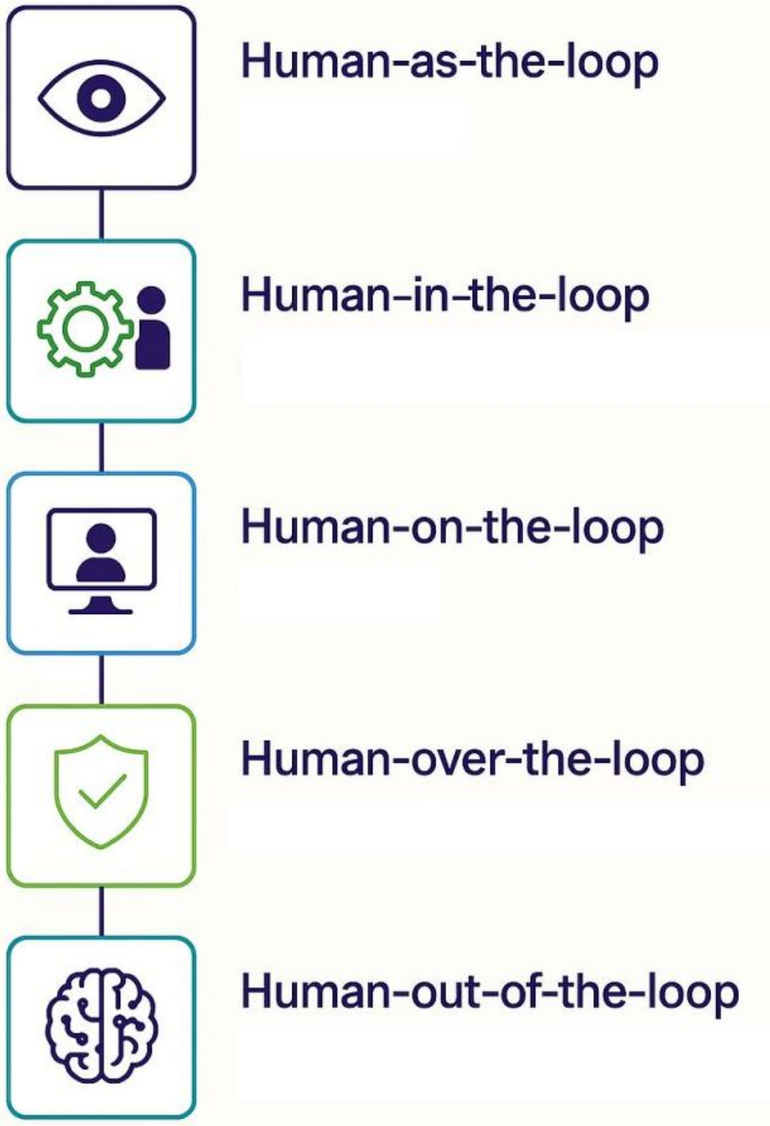




Journey towards Maturity - Human

Gradual removal of human engagement

- L0 - Full Manual
- L1 - Assisted operations
- L2 - Partial Autonomous Operations
- L3 - Conditional Autonomous Networks
- L4 - High Autonomous Networks
- Full Autonomous Networks



Three Layer Logical View

Critical: Impact radius of events

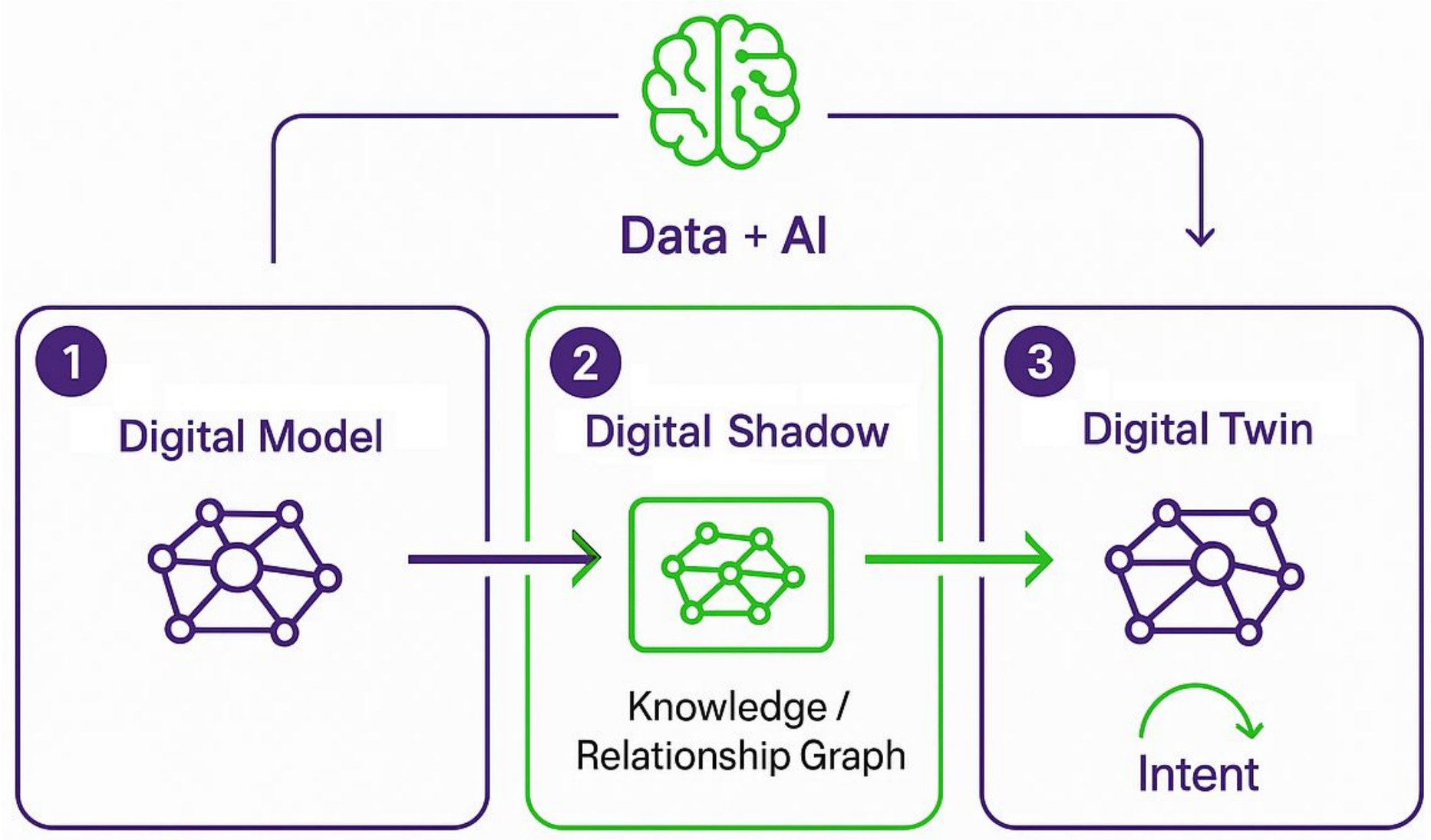
Foundational for Autonomous Networks Operations

Intelligence Layer — Analysis, Decision (Plan) block (may change), Agents in action

Ontology Layer — Causal correlation / knowledge graph, logical representation, MCP …

Data Layer — Ingestion, cleaning, aggregation (currently no AI, may change)

Network Digital Twin - History



Network Digital Twin Functions

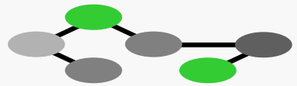
Impact Radius

Intent Verification

Network Digital Twin (Common Service)

What if | Optimization | Intent Verification | Anomaly Detection | RCA

Spatio/Temporal Causal Ontology Layer

(t-1)  (t) 

Network / Service / Demand Topology

Network / Service / traffic Insights

What is Different?

Anomaly Detection

Traditional - Trend oriented

- Check historical trend
- Establish normal
- Monitor data
- Identify deviation from normal
- Hidden assumption: there is fixed (seasonal) trend

AI Agent Age - Normal changes

- COVID time example
- AI Agents - no fixed logic
- Trends change
- Hard to find seasonality

Checklist Manifesto - Does it work in AIOps?

Checklists EVOLVE from procedures to INTENT + GUARDRAILS

Traditional (L0-L2)

- Fixed procedures
- Step-by-step
- Human approves
- Predefined actions
- Slow (30-60 min)

✓ AIOps (L3-L5)

- Intent-driven
- AI decides HOW
- Context-aware
- Adaptive learning
- Real-time (seconds)

Implementation Guidelines for TELUS

1	2	3	4	5
Define Intent	**Set Guardrails**	**Tier Approach**	**Enable XAI**	**Monitor & Learn**
Set SLAs, KPIs, targets	Safety limits, costs, compliance	T1: Auto | T2: Supervised | T3: Human	Log decisions, rationale, confidence	Feedback loop, validate, improve

New "Checklist" Framework

1. Intent
Define WHAT (e.g., <50ms latency)

2. Guardrails
Set boundaries (never >90% capacity)

3. Closed Loop
Aware→Analyze→Decide→Execute

4. Explainability
AI explains what, why, confidence

5. Escalation
Clear triggers for human oversight

6. Learning
Continuous improvement from data

Key Transformation

Traditional Checklist	AIOps Equivalent
Step-by-step procedure	**Intent + Policies**
Fixed sequence	**Adaptive decisions**
Human executes	**AI executes, human supervises**
Predefined actions	**Context-aware optimization**
Rigid rules	**Flexible guardrails**

Bottom Line: Checklists become "what NOT to do" (constraints) rather than "what TO do" (procedures) • AI has freedom to decide HOW within boundaries

Test in Traditional Ops vs AIOps + CI/CD vs CI/CD/CT

AI agents are UNPREDICTABLE → Testing must be CONTINUOUS IN PRODUCTION

CT also stands for Continuous Training

Traditional Testing (L0-L2)

When	Approach	Focus
Pre-deployment	Fixed test cases	Code correctness
Dev & Deploy stages	Manual execution	Functional reqs
Production locked	One-time validation	Performance

Testing Flow:
Unit → Integration → UAT → Deploy → **Production (NO testing)**

✓ AIOps Testing (L3-L5)

When	Approach	Focus
Continuous in Prod	Automated 24/7	**Intent achieved?**
Pre + Post deploy	Real prod data	AI decision quality
Real-time validation	Intent-based	Drift detection

Production Testing Phases (TM Forum IG1190D):
PUT (Prod Unit) → **PIT** (Prod Integration) → **PUAT** (Prod UAT) → **PNFT** (Prod Non-Functional)

Key Conclusions & Implementation Guidelines (TM Forum IG1190D)

1. Continuous Testing
Monitor AI in real-time. Auto-trigger tests after updates. Validate intent continuously.

2. Automated Validation
Automated test suites. Immediate results. Fast feedback loops.

3. Intent Verification
Verify AI achieves intent. Compare outcomes vs. expectations.

4. Production Environments
Blue-Green, Digital Twins, Production-like for validation.

5. Retrospective Testing
Evaluate self-healing post-execution. Validate autonomous decisions.

6. Testing SLAs
Fast response (<1 min). AI quality metrics. Clear criteria.

Bottom Line: Testing shifts from "test before deploy" to "test continuously in production" • AI unpredictability requires runtime validation

Incident & Problem Management: Traditional Ops vs AIOps

The line BLURS • Order CHANGES • Shift to PREDICTIVE

Traditional (L0-L2)

- **Clear separation**
- Incident: Restore service
- Problem: Fix root cause
- Sequential flow
- Reactive (60-70%)

✓ AIOps (L3-L5)

- **Lines blur**
- AI fixes before incident
- Self-healing bypasses
- Parallel flows
- Predictive (40%+)

Key Differences

Order
Traditional: Event→Incident→Problem
AIOps: Event→Problem (no incident!)

Approach
Traditional: Reactive
AIOps: Predictive & Proactive

Reproducibility
Traditional: Easy (deterministic)
AIOps: Challenging (non-deterministic)

Normal Behavior
Traditional: Fixed thresholds
AIOps: Statistical patterns

Detection
Traditional: After incident occurs
AIOps: Before incident happens

Resolution Time
Traditional: Days
AIOps: Minutes (AI-driven)

AIOps Problem Management Flows (TM Forum IG1190H)

1. **Predictive (>40%)** AI predicts → Fix root cause → Prevent incident
2. **Proactive (>30%)** Analytics/CRM → Detect problem → Prevent
3. **Self-healing (NEW)** AI detects → AI fixes → Retrospective validation
4. **End-user Driven (<10%)** User feedback → Fast channel → Immediate action
5. **Reactive (<20%)** Event → Incident → Problem (traditional)

Critical Challenges in AIOps

Challenge	AIOps Reality
Reproduce problem	**Non-deterministic, data-dependent**
Define "normal"	**Statistical, pattern-based, evolving**
Root cause	**AI identifies before incident**
Problem types	**+Data drift, bias, training gap**

Bottom Line: In AIOps, Problem Management becomes PRIMARY (predictive) • Incident Management becomes SECONDARY (reactive <20%) • AI identifies & fixes root causes before incidents occur

Threat Landscape & Autonomy

Why Telcos Are Prime Targets?

Critical Infrastructure

High-Value Intelligence

Complex Attack Surfaces

millions of network nodes

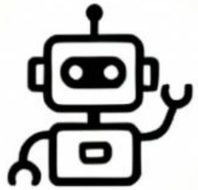
multiple technology generations

Constant Transition

legacy to cloud-native migration

How AI Changes the Attacker's Playbook

Four Attack Capabilities of AI-Powered Adversaries



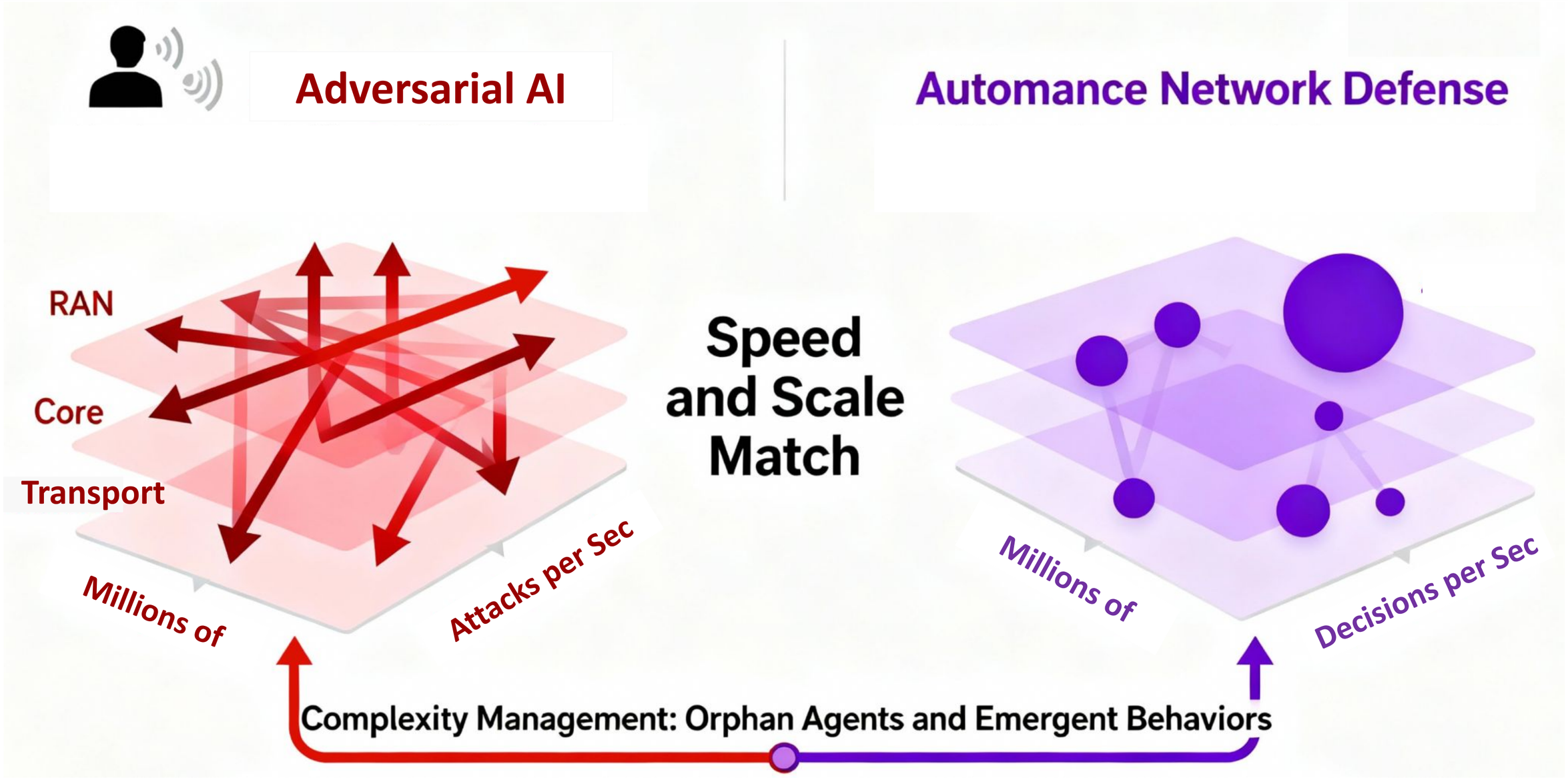
Automated Vulnerability Discovery: AI scanning code fast

Polymorphic Attack Generation: morphing attacks, shape-shifting

Corrdinated Multi-Vector Attacks: simultaneous strikes across network layers

Adversarial Machine Learning: poisoning data, training defenses against network

Autonomy Matches Adversarial Scale



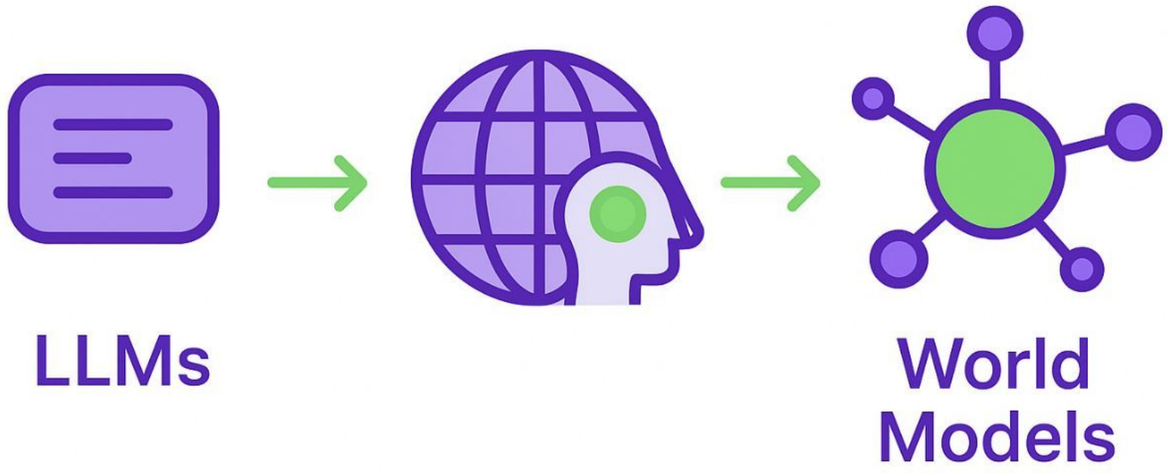
New Perspective

LLM is not Enough - New Directions

World Models Theory

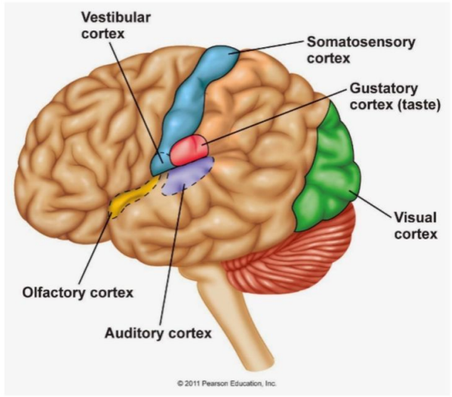
David Ha and Jürgen Schmidhuber

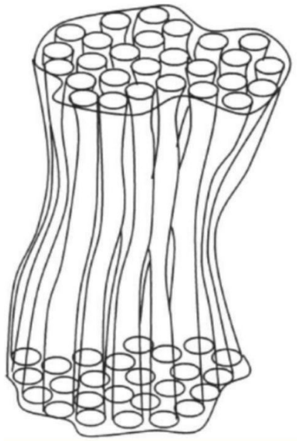
Yann LeCun

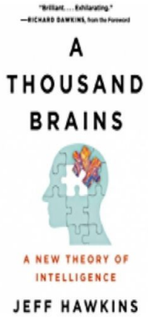


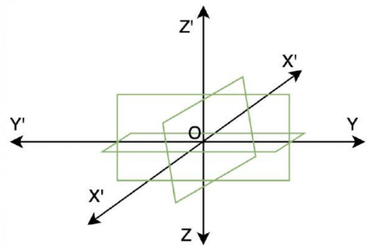
Thousand Brains Theory

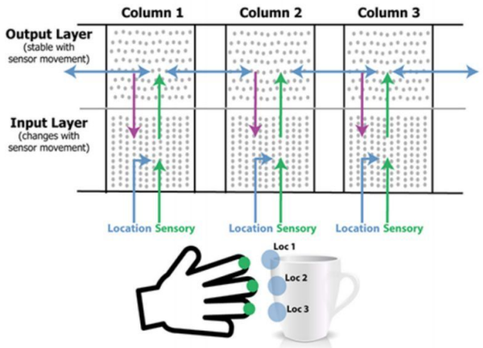
Vernon Mountcastle / Jeff Hawkins











Final Words

Call for Actions

Massive Scale of Agents

Model to Architecture

New Normal

Trend?

Agent Portability

Open Source - Vendor

Guardrails

Checklists?

Agent to Agent

Compatibility

the future is friendly®