

Where is AI in Our Everyday Business and Private Life

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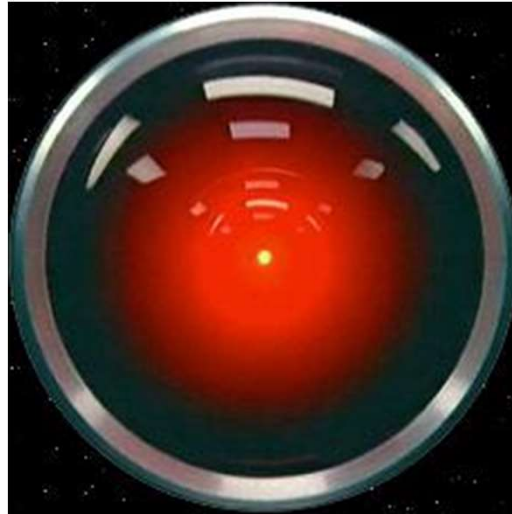
What is AI?



Is This AI?

*Machines will take over all management tasks,
rendering humans superfluous.*

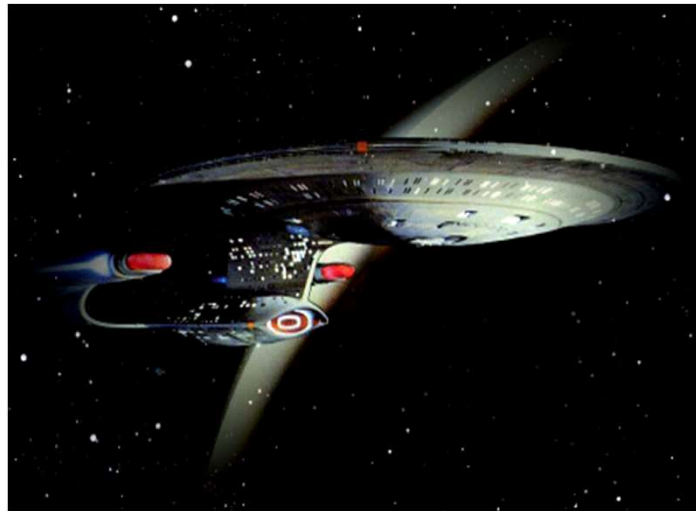
Hal 9000, 2001



Wrong!

Or Is This AI?

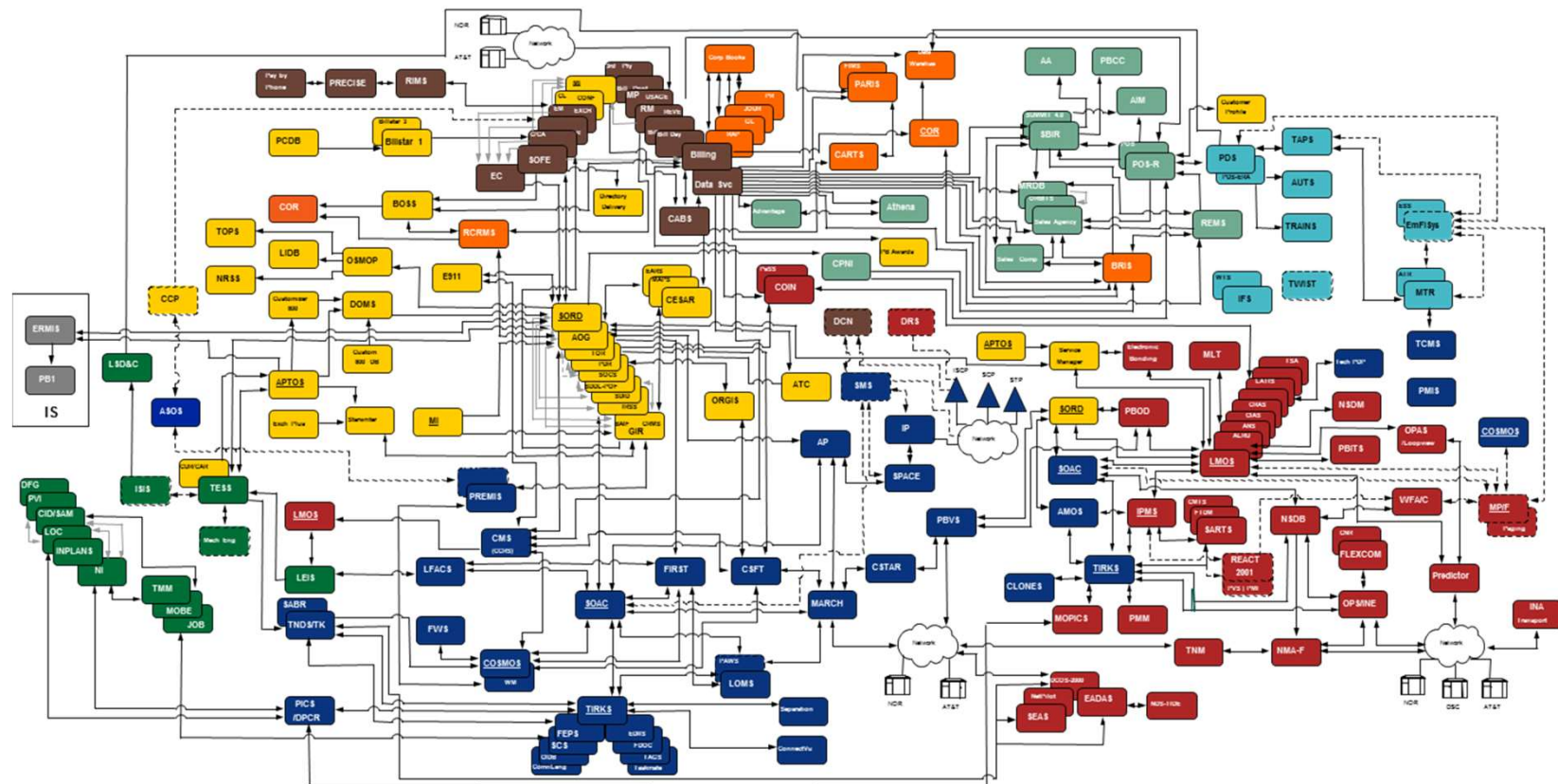
*Machines will free system administrators to
manage system at a higher level*



Right!

The Problem of Complexity

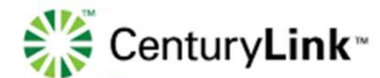




TCO Increases Faster than Revenue; Services Offered do not Align with Goals

Exemplary Uses of AI

- Starting from the customer: Chatbots, speech and voice services, predictive maintenance
- AT&T – Acumos platform with Tech Mahindra. | 3 phases: 1) Speech Recognition 2) Network Transformation; 3) IoT and Big Data. Also uses AI for network security, self healing, and AI assisted cell tower analysis
- Verizon – Condition based maintenance, B2B Exponent platform
- China Mobile – partner with SenseTime for facial recognition
- Comcast – X1 Talking Guide; Voice Remote – natural speech; Content recommendation using the “clicks” & metadata
- Century link – Angie email interaction ⇒ sales “hot leads”
- DISH – DVR compatible with Amazon’s Alexa
- Vodafone Spain – mobile network improvements
- Vodafone in Ireland – demand forecast on 3G network in the subsequent hour
- Telefonica with Juniper self driving network: self-config, monitor and diagnosis



Increasing Business Complexity

Simple Systems

- Small number of components that interact consistently
- Same action produces same result

Complicated Systems

- Many components , but operate in patterned ways
- Outcome is predictable from starting conditions

Complex Systems

- Large number of heterogeneous components that have different dependencies and can interact in different ways
- Same starting condition can produce different results depending on component interactions
- Software-intensive system IFF software contributions to design, construction, deployment, and evolution of the system as a whole



Solutions to Complexity



Technology to Manage Technology

Core expectation of AI is to enable true data-driven decisions aligned with goals

- Expert advisor enabling human staff to make optimal and fact-driven decisions
- Required due to complexity of environment

AI-driven automation

- AI is a “complexity reducer” that combines different information into one cohesive picture and provides alternate courses of action, each with weighted pros and cons
- Encourages trust by humans compared to black box approach



Applicability to End-Users



Providing Industries with a *Common* “Zero X” Experience

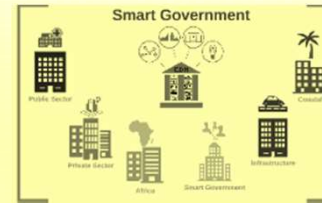
Autonomic Networks/ICT Services for Intelligent Society



Smart city



Smart industry



Smart government



Smart xxx...

Situational Awareness leads to Knowledge-as-a-Service

“Zero X” Experience

- ✓ Increase simplicity of user-system interaction
- ✓ Providers conquer complexity using common toolsets and cognition

As a Service

- Real-time, on demand, automated E2E full lifecycle
- Collaborative production and commercialization

As a Platform

- Developer-friendly
- Enablement of business collaboration and ecosystem between verticals and network/ICT service providers

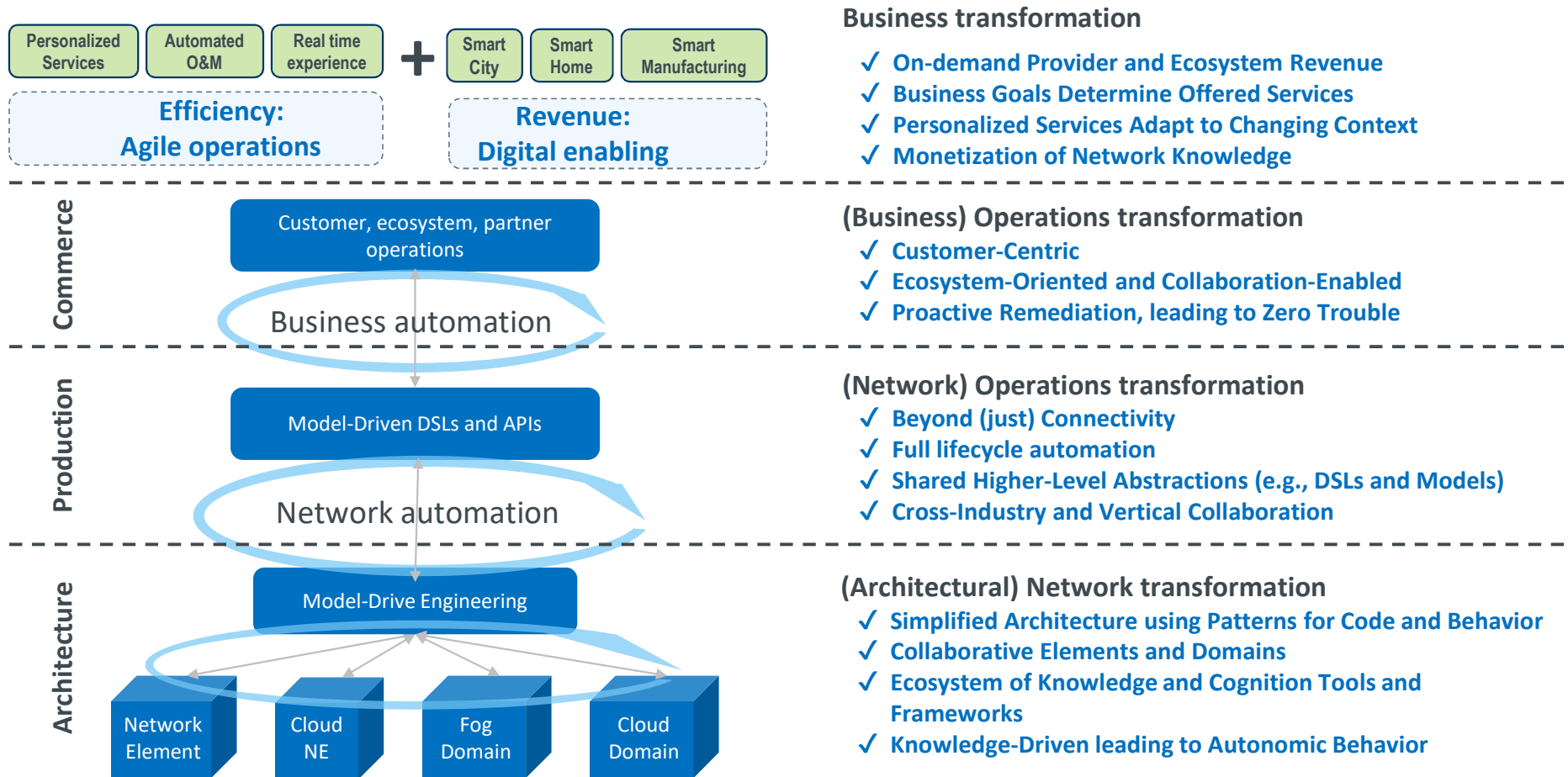


Applicability to Industry

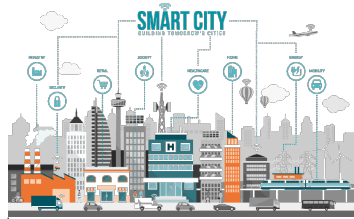


Industry Digital Transformation

AI is a Critical Part of Autonomic Behavior and Enhances Operations over E2E Lifecycle



Opportunities to Telecom Industry --- “Zero X” Experience



Smart city



Smart industry



Smart government



Smart xxx...

Autonomous Networks/ICT Services for Intelligent Society

“Zero X” Experience

- ✓ Make the simplicity to the users
- ✓ Leave the complexity with the providers

As a Service

- ✓ One stop, real-time, on demand, automated, E2E full lifecycle network/ICT services



As a Platform

- ✓ Enablement of business collaboration & ecosystem between verticals and network/ICT service providers

Zero Wait

Swift

- Launch
- Delivery
- Care

Autonomous

Network

Zero Trouble

Self-healing

- Business
- Services
- Infrastructure

Agile

Operations

Zero Touch

Simplified

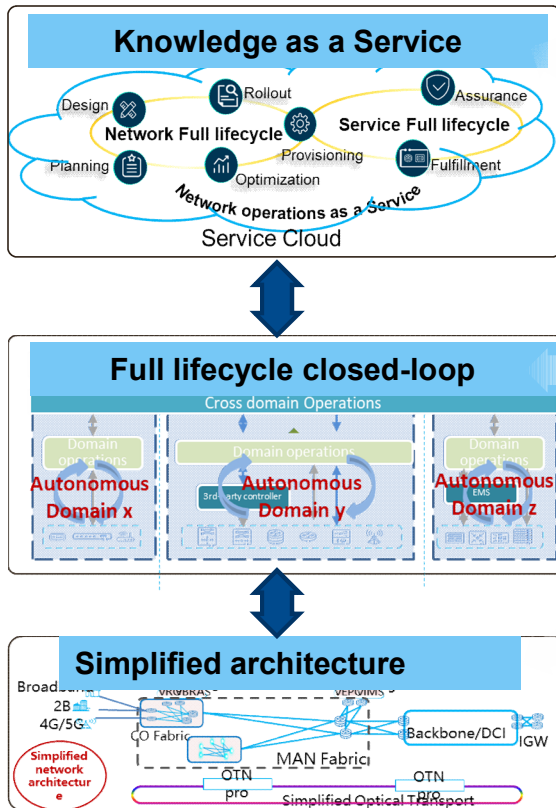
- Operations
- Development
- Maintenance

All-inclusive

Services

Autonomous Networks: automation levels

Data & knowledge driven intelligent, simplified networks



Self-configured, self-healing, self-optimized

Level Definition	L0: Manual Operation & Maintenance	L1: Assisted Operation & Maintenance	L2: Partially Autonomous Network	L3: Conditionally Autonomous Network	L4: Highly Autonomous Network	L5: Fully Autonomous Network
Execution (Hands)						
Awareness (Eyes)						
Decision (Minds)						
Service Experience						
System Complexity	Not applicable	Sub-task Mode-specific	Unit level Mode-specific	Domain level Mode-specific	Service level Mode-specific	All modes

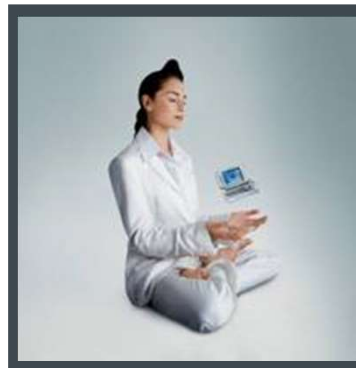
Best user experience, full lifecycle automation, maximum utilization

Summary

- High interest in AI, mainly for localized and specialized applications
 - *This needs to change to provide shareable knowledge and tools to build platforms*
- E2E ML/AI architecture and **industry agreements required to “close the loop”**
 - Clean Data and Normalization cross silo/vendor/tools/formats is still challenging!
 - Information Model supporting multiple data models
 - APIs are fundamentally static – need to investigate and use DSLs
- AI is essential for turning Data into Value
 - Starting with basic ML algorithms and evolution to Cognitive Networks
 - Enabling Human-like learning and Cognition
- The most lucrative applications are still open for us all
- Remove complexity from users
- Remove complex operations from Network/Service operations managers
- Zero touch Service and Management lifecycle – Autonomous networks



Questions?



*“Create like a god. Command like a king. Work like a slave”
- Constantin Brancusi*