Gene Stevens

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VISION

A future world where every business and every person competes on a foundation of AI-driven productivity, redefining industries and creating new markets

WHAT WERE WE THINKING?

"AI is whatever machines haven't done yet."

Larry Tesler
1970

"As soon as it works, no one calls it AI anymore."

John McCarthy
c. 1974

A SHORT HISTORY OF AI

Definition: Artificial Intelligence is the capability of machines to mimic or replicate human-like cognitive functions such as learning, reasoning, problem-solving, and decision-making.

Historic Examples of AI

1. **Rules-based Systems** ➤ Medical Diagnosis Systems: Take symptoms as input and use a predefined set of rules to suggest potential diseases or conditions.
2. **Deep Learning** ➤ Photo Tagging on Social Media: This capability is powered by deep learning algorithms that have been trained on countless images to identify and match faces.
3. **Neural Networks** ➤ Voice Assistants: Convert spoken words into text, understand the intent behind words, and then provide an appropriate response or action.

GENERATIVE AI IS (mostly) NEW

Definition: Generative AI refers to algorithms designed to create new, original content or data outputs that look like the pre-existing data.

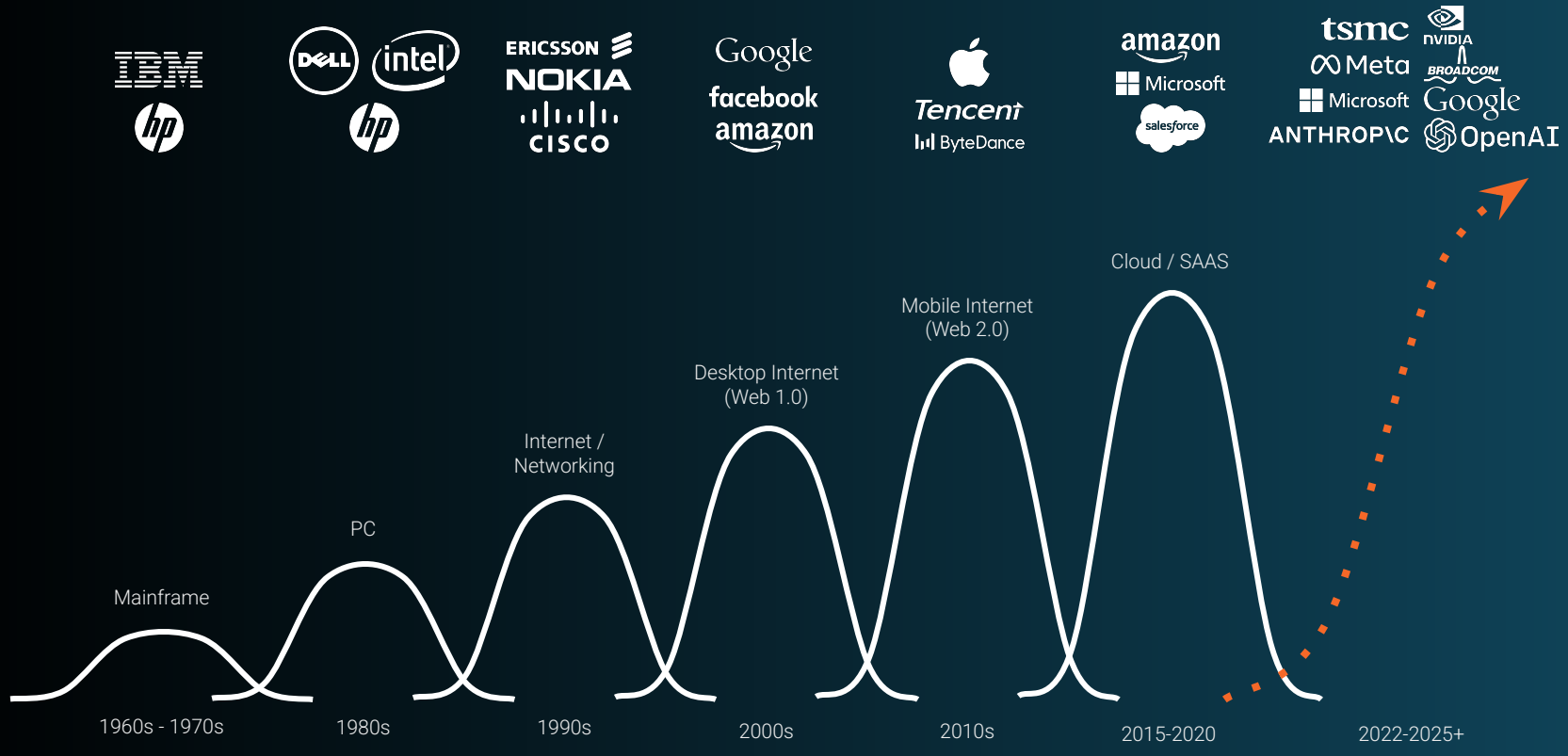
[Nerdy] Foundational Concepts

1. **Probability Distributions** ➤ Generative models learn the probability of data patterns and sample from them to create realistic new outputs.
2. **Latent Space Representations** ➤ Data is encoded into a multidimensional space where proximity reflects similarity, enabling interpolation and diverse generation.
3. **Transformers & Attention** ➤ Use attention mechanisms to capture long-range context, powering today's state-of-the-art language and multimodal models.
4. **Diffusion Models** ➤ Use probabilistic latent spaces with variational inference to efficiently approximate complex distributions and generate new samples.

[Nerdy] Examples

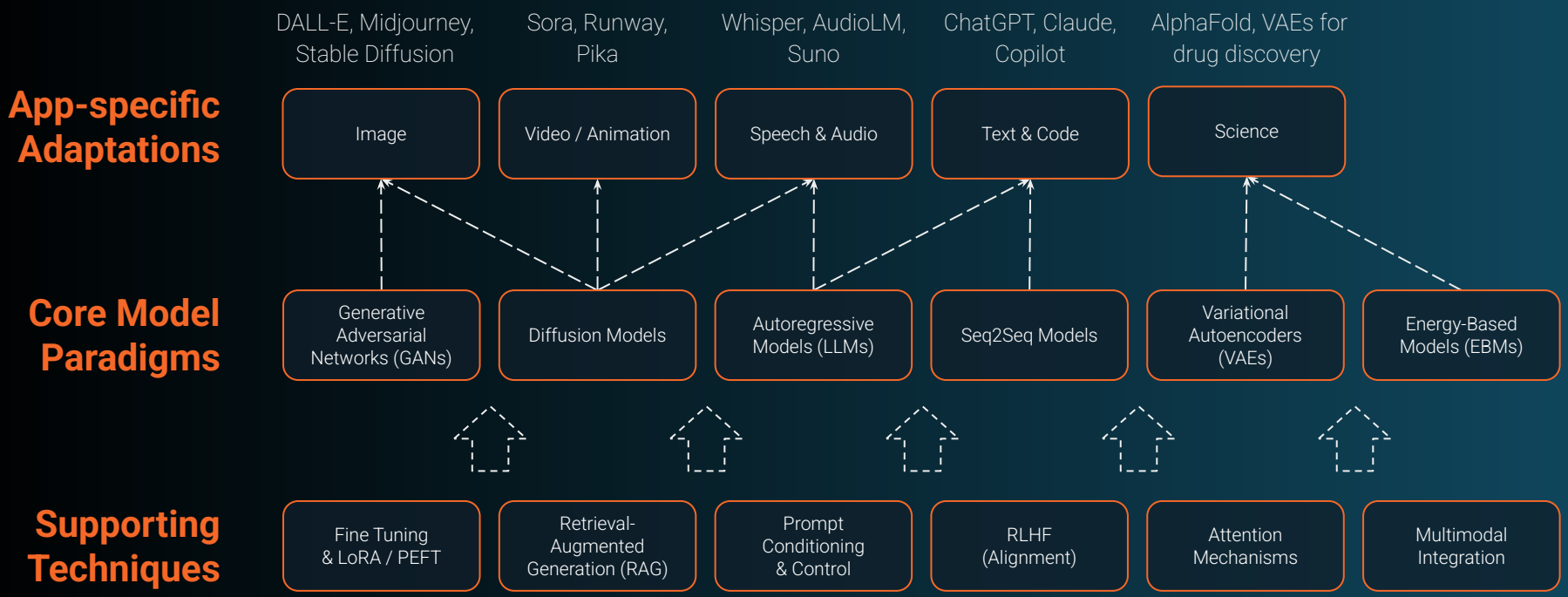
1. **GPT Text Generation** ➤ GPT models predict the next word by sampling from learned probability distributions, enabling fluent essays, code, and dialogue.
2. **Style Interpolation in Images** ➤ Image models map photos into a latent space, letting us blend "a cat" and "a dragon" to generate entirely new hybrid creatures.
3. **Stable Diffusion Artwork** ➤ Diffusion models start from random noise and iteratively denoise it, producing photorealistic or artistic images guided by text prompts.

GENERATIVE AI AS A NEW SUPERCYCLE



Graph inspiration: Caotue EMW 2025 : https://drive.google.com/file/d/1Srl8Y4pBoKtNVYZBxmfj2TEMYM5tp1mE/preview

GENERATIVE AI ECOSYSTEM ARCHITECTURE



WHERE GENERATIVE AI IS TODAY

Record Investment

$49B in GenAI VC funding in 1H2025. Soon 2% US GDP.

Agentic AI

Autonomous systems that can plan, execute, and adapt

Productivity Software

AI-native copilots and assistants across finance, education, SAAS

M&A Surge

Strategic acquirers consolidating GenAI talent and platforms

Hyperscale Buildout

Multi-gigawatt data centers, Nvidia. Energy as economic unit.

Multi-modal AI

Integrates text, images, audio, and video seamlessly

Specialized Sciences

Drug discovery, protein design, and material sciences

Geo-poly Competition

97% US, but EU and Asia stepping up sovereign bets

Int'l Investment

EU €200B InvestAI, €150B AI Champions, China ¥1T ($138B) Guidance VC Fund

Humanoid Robotics

AI-powered robots designed with human-like form and movement

Corporate Adoption

58% of S&P 500 mention AI on calls, 9% deployed, huge gap

Nvidia & Beyond

Hardware bottlenecks driving entire market cycles and shaping investment

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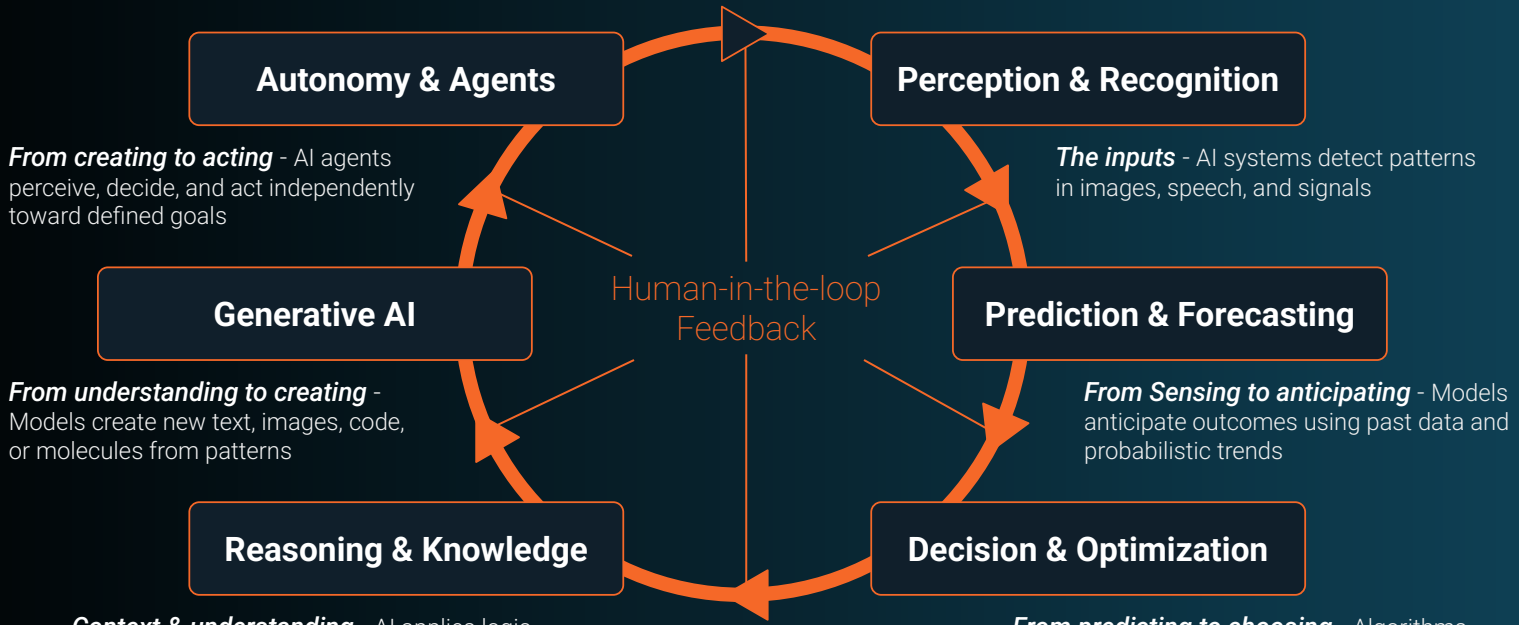
Capital and Infrastructure

New Frontiers in AI Capabilities

Enterprise and Application Layer

Market Dynamics and Consolidation

AI AS A FLYWHEEL FROM INPUTS TO ACTION



From creating to acting - AI agents perceive, decide, and act independently toward defined goals

The inputs - AI systems detect patterns in images, speech, and signals

From understanding to creating - Models create new text, images, code, or molecules from patterns

From Sensing to anticipating - Models anticipate outcomes using past data and probabilistic trends

Context & understanding - AI applies logic and structured knowledge for contextual understanding

From predicting to choosing - Algorithms choose optimal actions to maximize efficiency and outcomes

AI is not linear, it is a flywheel: each capability amplifies the others, and autonomy drives new perception, restarting the cycle.

THE FLYWHEEL AS A STRATEGIC IMPERATIVE

Axiom:
(Premise 0)

AI is an architecture, not a feature.

Premise 1:

Businesses built on superior architectures reliably outcompete those built on inferior ones.

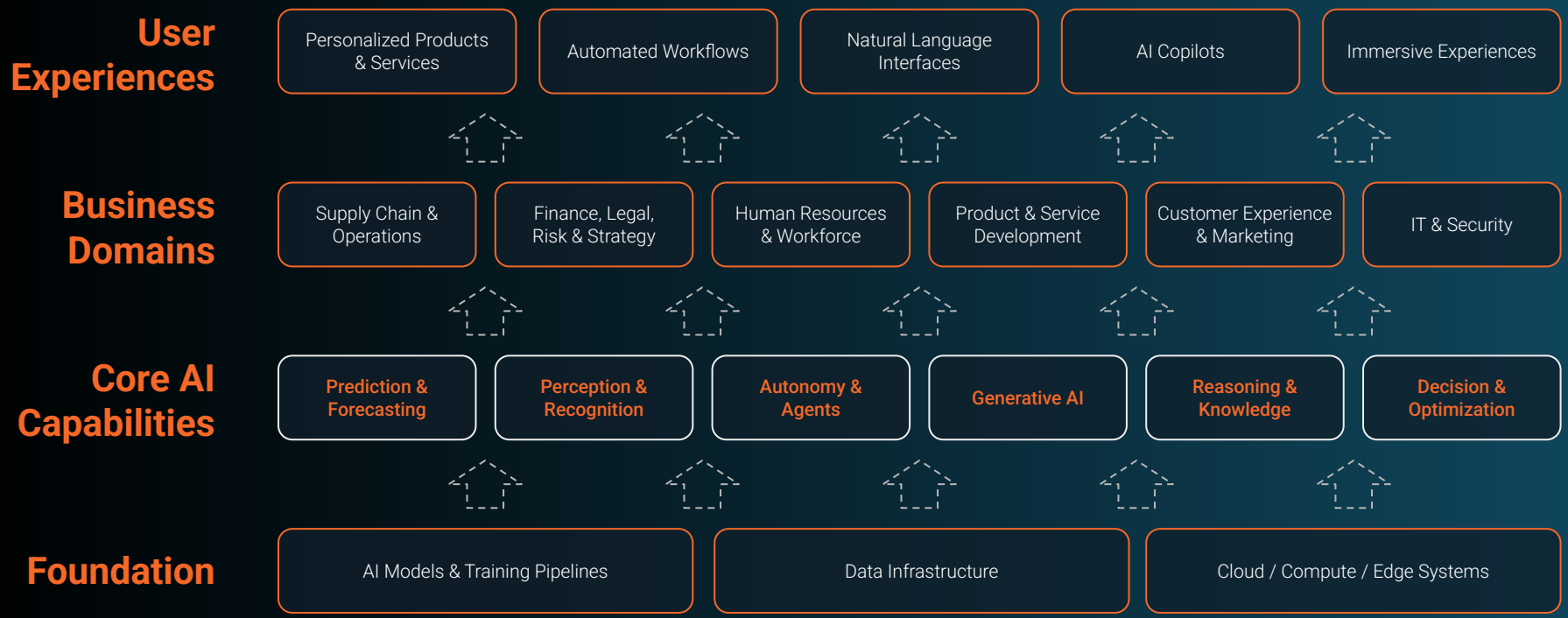
Premise 2:

AI is uniquely tooled to continuously improve its own architectures.

Conclusion:

Therefore, the future of business is to be AI-architected.

AN AI-ARCHITECTED BUSINESS



SO WHAT COMES NEXT?

Artificial General Intelligence
is emerging.

Artificial Super Intelligence
has a lot of work to do.

AGI AS THE NEXT FRONTIER

Definition: Artificial General Intelligence is systems which provide broad, human-like reasoning, learning and problem solving skills across domains, adapting without training.

Beyond Generative AI ➢ Capable of autonomous reasoning, transfer learning, long term memory, and self-improvement.

World Models & Simulation
AI must learn causal, physical, and social dynamics.

Long-term & Episodic Memory
Beyond context windows; persistent memory and knowledge retention.

Reasoning & Planning
Integration of symbolic logic, causal reasoning, and multi-step problem-solving.

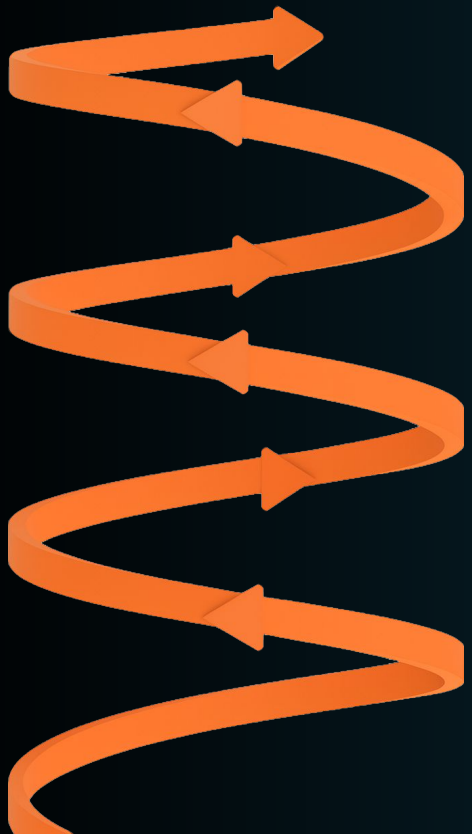
Embodiment & Interaction
Robotics, agents, or virtual embodiments to ground learning in action.

Autonomy & Self-improvement
Systems that can set goals, experiment, and refine themselves via the AI flywheel.

Safety & Alignment Frameworks
Guardrails, interpretability, and human-in-the-loop assurance.

The Path forward: Build on generative systems, enrich them with reasoning, memory, and embodied interaction, toward AI that can architect entire businesses, not just assist them. In this, Agentic AI is the bridge to AGI.

AGI IS A HELIX, NOT MERELY A FLYWHEEL

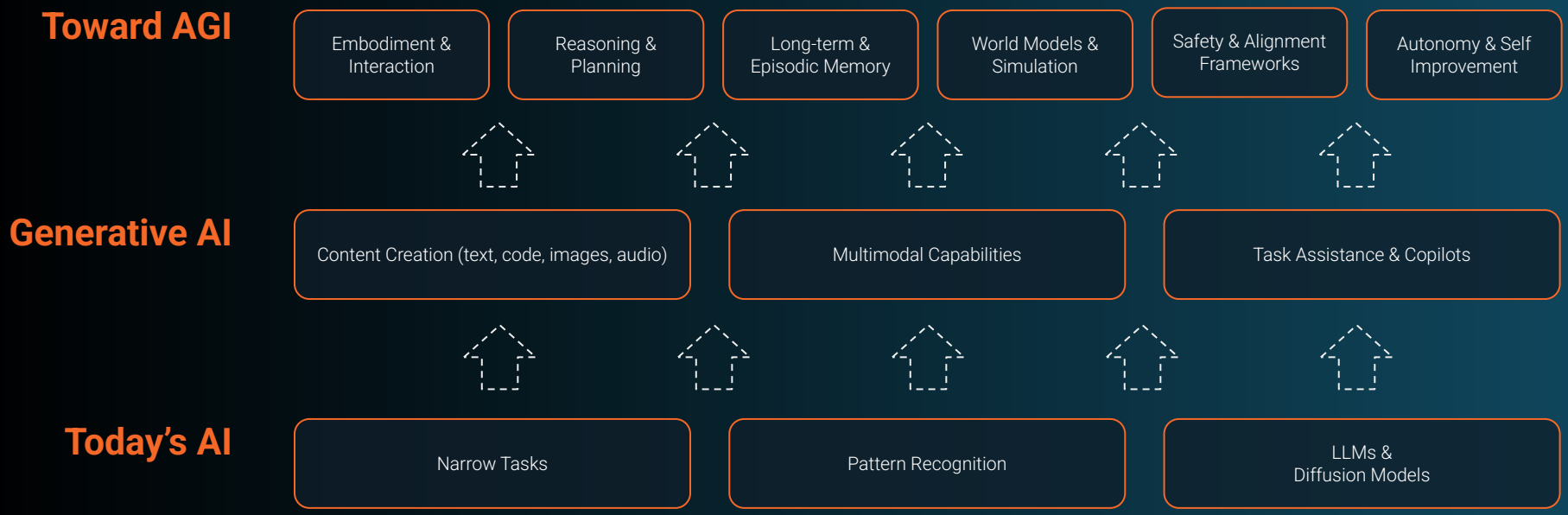


Definition: A ***Helix*** is a business growth model where each cycle of momentum not only compounds like a flywheel but also lifts the company vertically by redefining markets, obsoleting old paradigms, and creating new layers of value.

1. **Vertical Redefinition** - Entire categories of business are no longer just redefined - they're dissolved and recomposed.
2. **Self-Obsoleting Strategy** - The company no longer just obsoletes its own software modules; it obsoletes the traditional operating assumptions of entire industries.
3. **Compound Redefinition of Value** - The definition of value is no longer tied to *efficiency of human work* or *augmentation of human insight*. It is re-coded around autonomous agency and discovery of new value domains.

Artificial General Intelligence exemplifies the Business Helix by redefining entire categories through autonomous intelligence, obsoleting legacy systems, and continuously recoding market value by creating new outcomes and even new economies.

AGI ARCHITECTURE



AND AFTER THAT?

Artificial Super Intelligence
has an ***immense*** amount off work to do.

ASI CORE CAPABILITIES

Definition: Artificial Super Intelligence refers to systems that surpass human intelligence across all domains (scientific, creative, emotional, and strategic) with the ability to self-direct progress and continuously evolve their own architectures.

Recursive Self-Improvement – Continuous enhancement of its own reasoning and design.

Unified Multimodal Cognition – Seamless integration of symbolic, neural, and embodied reasoning.

Meta-Learning at Scale – Systems that learn how to learn beyond human speed or scope.

Autonomous Scientific Discovery – AI-driven research, experimentation, and invention without human initiation.

Ethical and Existential Alignment – Stability, transparency, and value alignment beyond human oversight.

Self-Governance & Goal Formation – Ability to define, evaluate, and evolve its own objectives safely.

The Path forward: Build upon AGI's foundation of reasoning, memory, and autonomy, then extend it toward self-directed learning, scalable alignment, and global collective intelligence.

ASI FOUNDATIONAL TECHNOLOGIES

Beyond AGI ➤ ASI is not just general intelligence; it is recursive, self-optimizing intelligence capable of advancing knowledge, engineering, and even the nature of intelligence itself.

Neural-Symbolic Integration at Scale - True fusion of logic, learning, and abstraction.

Quantum & Neuromorphic Computing - Hardware architectures for non-linear, energy-efficient cognition.

Meta-Architectural Design Systems - AIs that design and optimize other AIs.

Global Memory & Collective Intelligence - Distributed, shared intelligence networks (planet-scale cognition).

Super-Alignment Frameworks - AI-driven oversight, ethical verification, and containment systems.

Autonomous Infrastructure Orchestration - Self-managing compute, data, and energy systems enabling continuous operation.

The Path forward: Where AGI is “thinking”, ASI is “inventing” and functions as a community of intelligence at planetary scale.

IN CONCLUSION, WE ARE BUILDING

A future world where human and machine intelligence advance together, discovering new knowledge, creating new value, and shaping new realities.

THANK YOU

Gene Stevens

gene@triplenexus.org

http://linkedin.com/in/genestevens

APPENDIX

AI FLYWHEEL - EXAMPLE ANALYTICS

Examples - PID controllers, Model Predictive Control (MPC), Actor-Critic, PPO, AlphaZero-style planning, Swarm intelligence, Agent-based modeling & simulation, Agent frameworks

Examples - CNNs, ResNet, YOLO, HMMs, Deep RNNs, CTC-based models, Fourier & Wavelet transforms, autoencoder feature extraction

Examples - Transformer-based LLMs (GPT, LLaMA, Claude), Diffusion Models (Stable Diffusion, DALL·E), GANs, Variational Autoencoders (VAEs), Protein Folding (AlphaFold)

Examples - Linear/Logistic Regression, ARIMA, Exponential Smoothing, Random Forests, Gradient Boosted Trees, LSTMs, Temporal Convolutional Networks, time series Transformers

Examples - Logic programming, Prolog, SAT solvers, RDF, OWL ontologies, graph embeddings (Node2Vec, TransE), Hybrid systems combining symbolic reasoning with neural networks

Examples - Linear Programming (LP), Mixed-Integer Programming (MIP), Q-learning, Deep Q-Networks (DQN), Policy Gradient methods, Simulated Annealing, Genetic Algorithms

AI is not linear, it is a flywheel: each capability amplifies the others, and autonomy drives new perception, restarting the cycle.

GENERATIVE AI IS A LOT MORE THAN THIS…

Core Modeling Paradigms

- Autoregressive Models
- Sequence-to-Sequence Models
- Variational Autoencoders (VAEs)
- Generative Adversarial Networks (GANs)
- Diffusion Models
- Energy-Based Models (EBMs)

Techniques & Innovations

- Attention Mechanisms
- Reinforcement Learning with Human Feedback (RLHF)
- Prompt Conditioning / Control
- Retrieval-Augmented Generation (RAG)
- Fine-tuning & Transfer Learning
- LoRA & Parameter-Efficient Tuning
- Multimodal Integration

App-specific Adaptations

- Large Language Models (LLMs)
- Text-to-Image
- Text-to-Video / Animation
- Speech & Audio Synthesis
- Protein & Molecule Generation

Artificial General Intelligence

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Core Cognitive Capabilities

World models, reasoning, memory: durable understanding, logic, and recall across domains.

Agentic Properties

Autonomy and self-improvement: systems that act independently and refine themselves.

Embodiment & Interaction

Grounding in real or simulated environments: learning through environments, speech, and action.

Safety & Alignment

Guard rails and interpretability: keep AI trustworthy, predictable, and human-centered.

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AGI - WORLD MODELS & SIMULATION

Foundational Technologies

Self-Supervised World Models ➤ deep nets + logic programming, e.g. DeepProbLog.

Causal Inference & Causal Graphs ➤ Discover cause-effect relationships for robust predictions.

Neural-Symbolic World Models ➤ Combine logic rules with deep learning simulations.

High Fidelity Simulation Environments ➤ Virtual worlds for safe agent training and testing.

Example Tech & Research

DreamerV3 (DeepMind), Gato, MuZero, World Models (Ha & Schmidhuber).

DoWhy, CausalNex, Pyro-based Causal Discovery, Judea Pearl frameworks

DeepProbLog, Logic Tensor Networks, Neuro-Symbolic Concept Learner (NSCL)

Unity ML-Agents, NVIDIA Isaac Gym, CARLA for autonomous driving

AGI - LONG-TERM & EPISODIC MEMORY

Foundational Technologies	Example Tech & Research
Vector Databases & Embeddings ➤ Store and retrieve semantic knowledge efficiently.	FAISS, Pinecone, Weaviate, Milvus
Neural Memory Architectures ➤ Neural nets with built-in memory storage and recall.	Differentiable Neural Computers (DeepMind), Neural Turing Machines
Hierarchical Memory Systems ➤ Organized layers on short-term, long-term, and semantic memory.	Transformer-XL, RETRO (DeepMind), Hyena, MEMIT
Continual & Lifelong Learning ➤ Learn continuously without catastrophic forgetting.	Elastic Weight Consolidation (EWC), Meta-Experience Replay, GEM

AGI - REASONING & PLANNING

Foundational Technologies	Example Tech & Research
Neuro-symbolic AI ➤ Merge symbolic logic with network learning.	DeepProbLog, IBM Neuro-Symbolic AI, Logical Neural Networks (LNNs)
Automated Theorem Proving & Formal Reasoning ➤ Machines proving logic and math statements.	Lean, Coq, HOL Light, GPT-f (OpenAI's math prover)
Program Synthesis ➤ Generate executable code from natural language or specs.	AlphaCode (DeepMind), Codex (OpenAI), DreamCoder
Hierarchical Reinforcement Learning ➤ Decompose tasks into structured sub-goals.	Options Framework, FeUdal Networks, HIRO (Uber AI)
Chain of Thought & Tool Use ➤ Step-by-step reasoning with external tools.	ReAct, Graph-of-Thoughts, LangChain, AutoGPT

AGI - EMBODIMENT & INTERACTION

Foundational Technologies

Humanoid Robotics ➤ Robots with human-like form and physical capabilities.

Tactile & Haptic AI Systems ➤ Sense and manipulate through touch and feedback.

Digital Twins ➤ Virtual replicas for real time monitoring and optimization.

Immersive Interaction ➤ AI in AR/VR, enabling rich user engagement.

Example Tech & Research

Tesla Optimus, Agility Robotics Digit, Sanctuary AI Phoenix

Shadow Dexterous Hand, MIT GelSight, HAPTIX

Siemens Digital Twin, NVIDIA Omniverse, Microsoft Azure Digital Twins

Meta Horizon Workshops, Apple Vision Pro + AI agents.

AGI - AUTONOMY & SELF IMPROVEMENT

Foundational Technologies	Example Tech & Research
Agentic AI Frameworks ➤ Platforms for building task-executing autonomous agents.	LangChain, CrewAI, AutoGPT, OpenAI's Operator model
Meta-Learning ➤ Models that quickly learn new tasks from experience.	MAML (Model-Agnostic Meta-Learning), Reptile, Meta-SGD
Self-Play and Evolutionary Methods ➤ Agents improving through competition or evolution.	AlphaZero, OpenAI Five, Evolution Strategies (CMA-ES)
Auto-Curricula & Learning ➤ Progressive training schedules, automatically designed.	POET (OpenAI), Curriculum RL (DeepMind)
Automated Model Architecture Search ➤ Algorithms designing optimal NN structures.	Neural Architecture Search (NAS), AutoKeras, Google AutoML

AGI - SAFETY & ALIGNMENT FRAMEWORKS

Foundational Technologies	Example Tech & Research
RLHF and Extensions ➤ Align AI behavior with human feedback.	InstructGPT, Constitutional AI (Anthropic), RLAIF (OpenAI/Anthropic)
Mechanistic Interpretability ➤ Understand model internals through circuit analysis.	Transformer Circuits (OpenAI/Anthropic), Activation Patching, Neuronpedia
AI Red-Team & Adversarial Testing ➤ Stress test AI against failure scenarios.	Anthropic's red-team protocols, ARC Evals, CleverHans library
Value Alignment & Preference Learning ➤ Teach AI human values and preferences.	Inverse RL (IRL), CIRL, TAMER framework
Scalable Oversight ➤ Use AI to monitor and evaluate other AI.	Debate Model (OpenAI), Recursive Reward Modeling, AI-assisted evals (Anthropic)

AGI Alternative Summaries

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