

GENERATIVE AI IN MEDIA:

WHAT IT IS AND WHAT  
IT MEANS FOR THE  
MEDIA INDUSTRY



# INTRODUCTION: WE ARE AT AN INFLECTION POINT

After years of false starts and marketing hype, recent generative AI applications mark a turning point in how AI can create new capabilities and challenges for the media industry.

The amount of talent and venture capital going into Generative AI (up 425% since 2020, to \$2.1 Billion in 2022) is certain to create tools that will transform the content creation process.

But a lot of unknowns remain. The tech is still experimental (its capabilities are good in certain areas and poor in others), and legal, regulatory, and governance implications are still unclear.

This document is meant to help professionals in the media industry think more clearly about AI and its implications for the industry, especially around what skills will be needed in an AI-augmented future.

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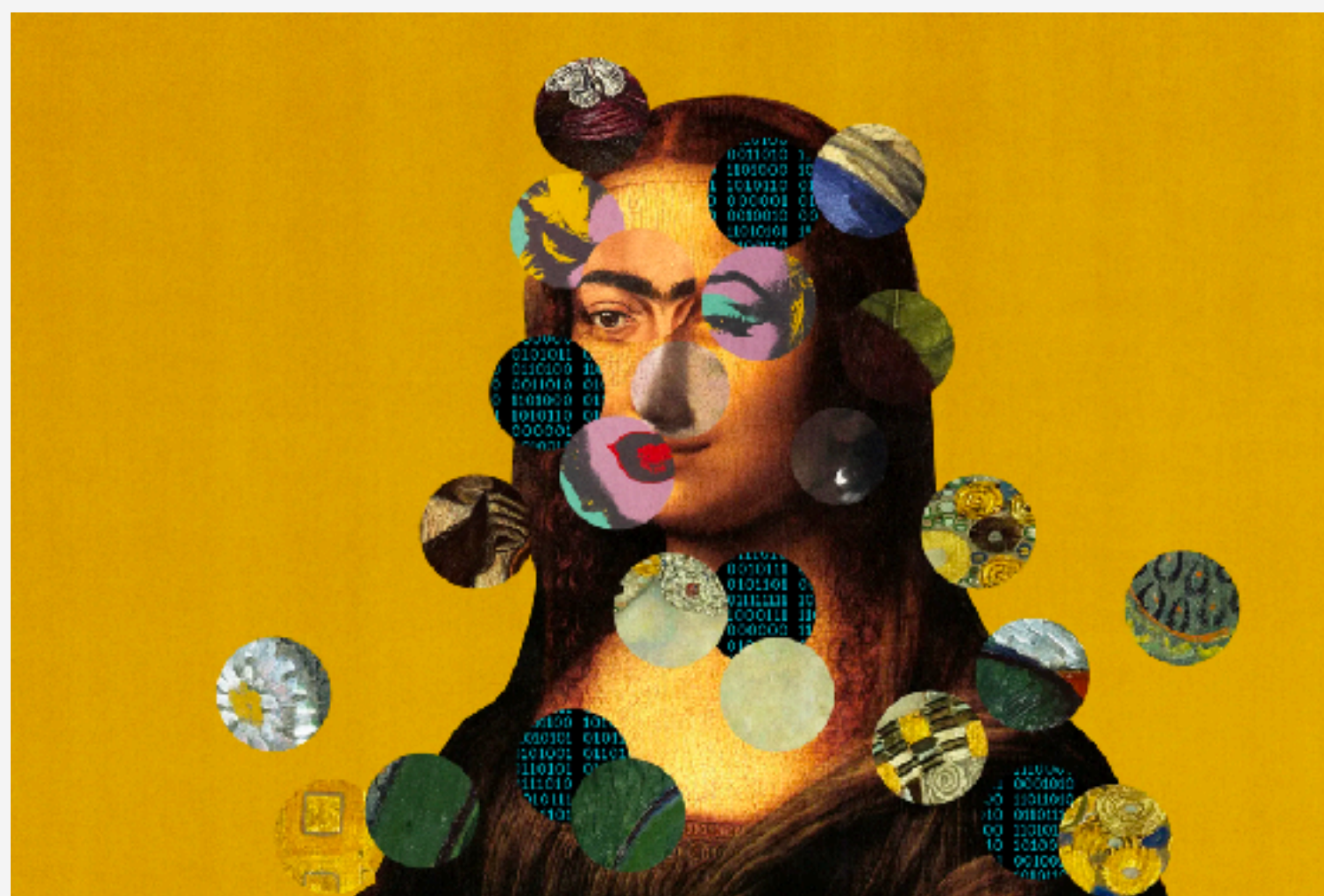
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# 1. EXECUTIVE SUMMARY



## GENERATIVE AI MARKS A JUMP IN CAPABILITY FOR THE INDUSTRY

*Don't not believe the hype.* The field of machine learning has finally reached a point where legitimate applications can be built that will make the content creation process more effective, faster, and cheaper. Generative AI is one in a handful of domains that are making promising breakthroughs.



## BUT THERE ARE MORE QUESTIONS THAN ANSWERS RIGHT NOW

*But don't drink the Kool-Aid.* The technology is still experimental, highly dependent on large and clean training data (which is expensive to collect and maintain) and ungodly amounts of computation. As always with AI and machine learning, the devil is in the details. And besides the inherent costs and tentative results of AI, the legal, regulatory and ethical implications of the tech are still unclear. Trust and verify.



## BUT MEDIA ORGANIZATIONS NEED TO ADAPT TO TAKE ADVANTAGE

*It's time to get serious about AI.* The field is progressing very fast, and its only a matter of time until applications and use cases emerge that will transform the media industry. Media executives need to be educated about what AI is and isn't. Technical executives need to learn to talk about AI to non-technical executives. New skills are needed, such as managing the data-business interface (and the trust issues around it).



## 2. NOUS SOMMES TOUS DAVE BOWMAN: WHAT'S GOING ON IN AI RIGHT NOW



# THE HUMAN-MACHINE CONTINUUM



What we are seeing right now is a sudden acceleration in the capabilities of AI and machine learning building on years of research and investment.

Lots of available data + lots of cloud compute + lots of investment + lots of talent = AI breakthroughs.

The current acceleration is also a turning point in the way machine learning experts are building their models. After years of experimentation, proponents of deep neural networks have finally accepted the reality that autonomous learning needs “humans in the loop” and old-fashioned object programming to fine-tune the models and create human-level capabilities.

In other words, the myth of 100% machine-based intelligence has been temporarily set aside. Experts still don’t know how to build anything remotely close to machine-based Artificial General Intelligence (AGI), so they’ve resigned to building hybrid machine-human learning architectures.

And it’s working. Applications using a mix of neural nets and human feedback have created capabilities orders of magnitude greater than their predecessors.

This new trend is moving the entire field of AI in the direction of a philosophy called Neural-Symbolic AI, which for decades now has been advocating such hybrid solutions to the problem of machine intelligence. Neural-Symbolic AI not only makes AI applications more “human-ready” (they can ingest real-world context and thus be more relevant to our environment), but more explainable and transparent.

The nature and often impressive capabilities of ChatGPT are a testament to this reality: what makes the model powerful is that it’s making an optimal use of the scale of deep learning and the nuance of human tuning/education.

This technical reality, along with the necessities of ethical AI development (emerging governance issue for corporations) and increasing pressures from regulators, is creating a new class of valuable skills: managing the business-AI interface and the endemic misinformation and trust issues around it.





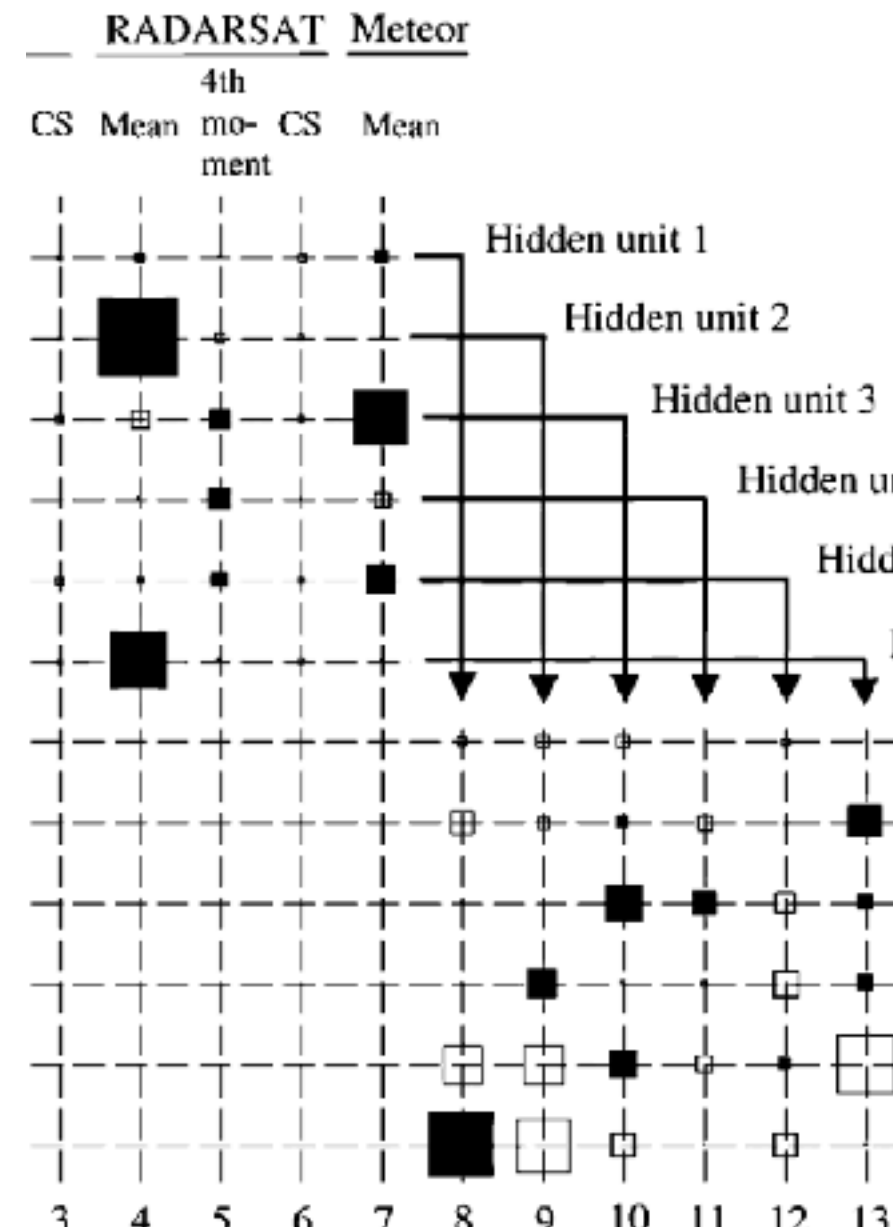
## 1956-1974: SYMBOLIC FOUNDATIONS

In the beginning, AI was almost indistinguishable from traditional computing. Early pioneers like Marvin Minsky or Herbert Simon saw intelligence as the capability to reason over symbols. These could be somehow abstracted manually from low-level data (such as text) through hand-built “maps” of knowledge. AI was human-made and human-readable, but there was little to no pure “machine intelligence” to it beyond a set of if/then statements.



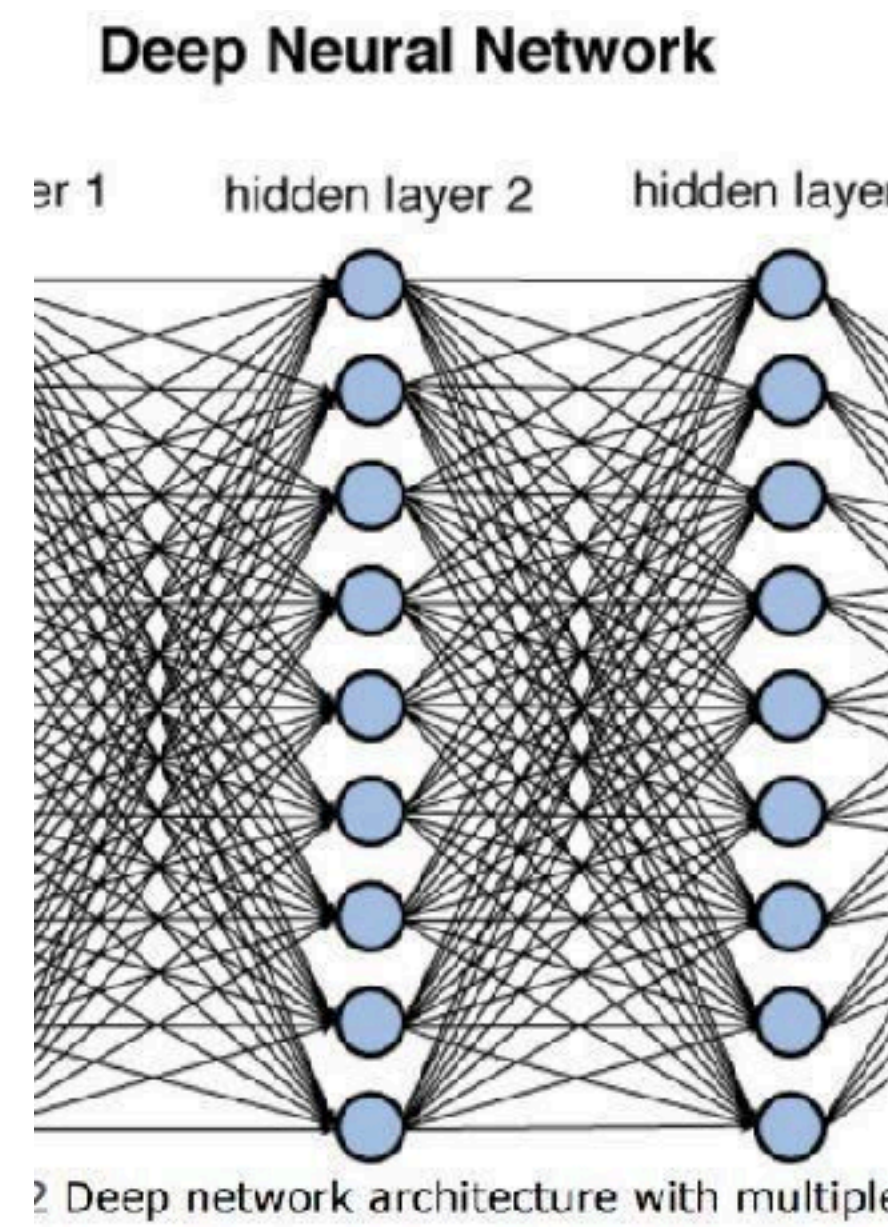
## 1975-1985: PERCEPTRONS AND THE FIRST AI WINTER

Not everyone agreed with the symbolic paradigm, which - understandably- didn’t feel like machine intelligence. Cognitive psychologists like Frank Rosenblatt started researching the capability to create artificial versions of human neurons as a foundation for “machine learning”. Early research on perceptrons was promising but ran into limitations of 1950s-1960s computing (computers were just not powerful enough) and the unavailability of large datasets. “Connectionism”, as it became known, didn’t lead to meaningful applications.



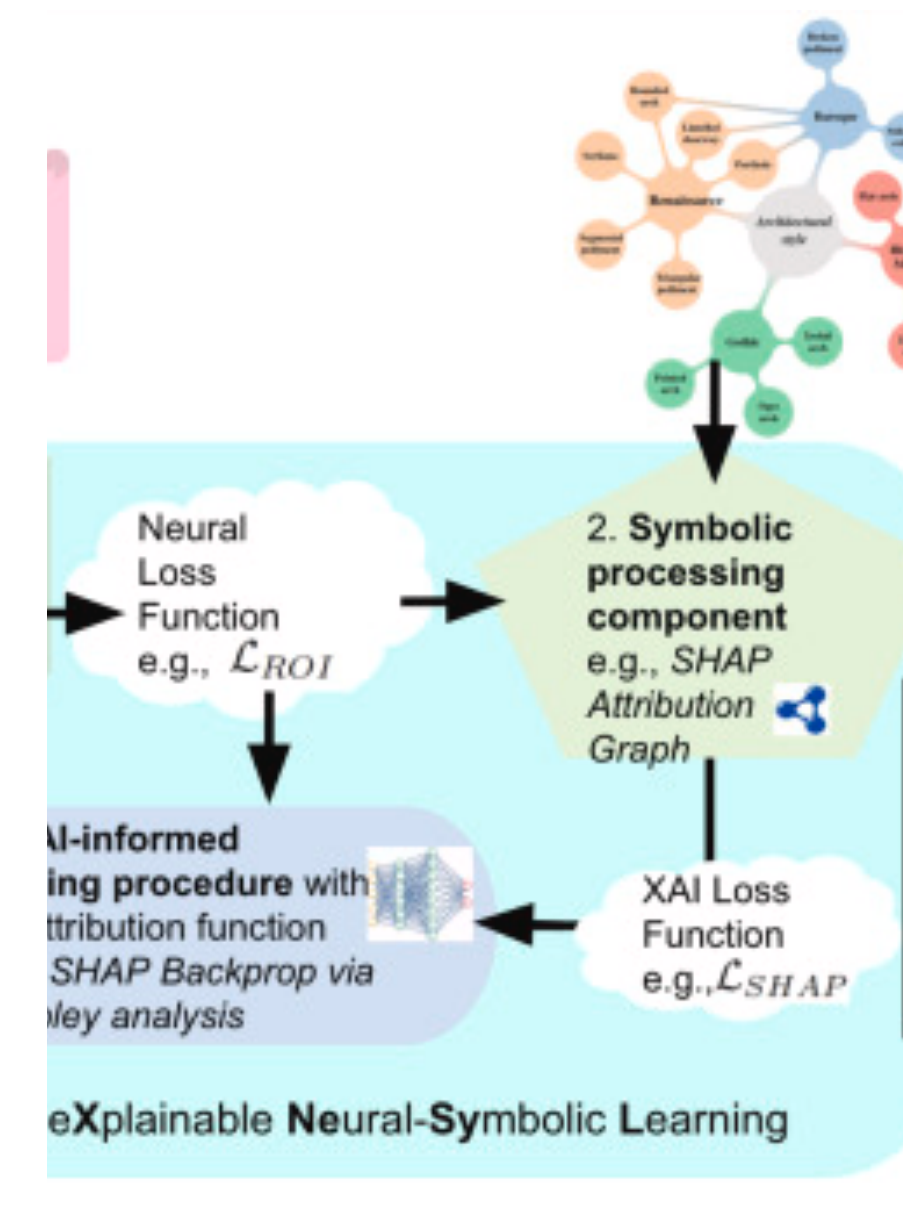
## 1986-2012: NEURAL NETS EMERGE

With computing power becoming more available, and thanks to AI funding from the Department of Defense, connectionism research continued. Cognitive psychologists like Geoffrey Hinton and David Rumelhart made a breakthrough in 1986 by inventing the backpropagation algorithm, which allows for neural networks to learn “autonomously” through curve-fitting (in reality a lot of manual hyper-parameter tuning is involved). This felt like real, “autonomous”, machine-driven learning. The neural nets revolution was unleashed.



## 2013-2023: THE GOLDEN AGE OF DEEP LEARNING

The quick rise in the availability of training data and computing power, as well as the intense interest of large corporations like Google, propelled connectionism into its golden age, even giving the field of Reinforcement Learning (autonomous learning by trial and error for AI agents) a massive boost. Symbolic AI continued to thrive in the pharmaceutical, defense and search industries (Google Search uses knowledge graphs), but neural nets captured the headlines, the buzz, and the funding.

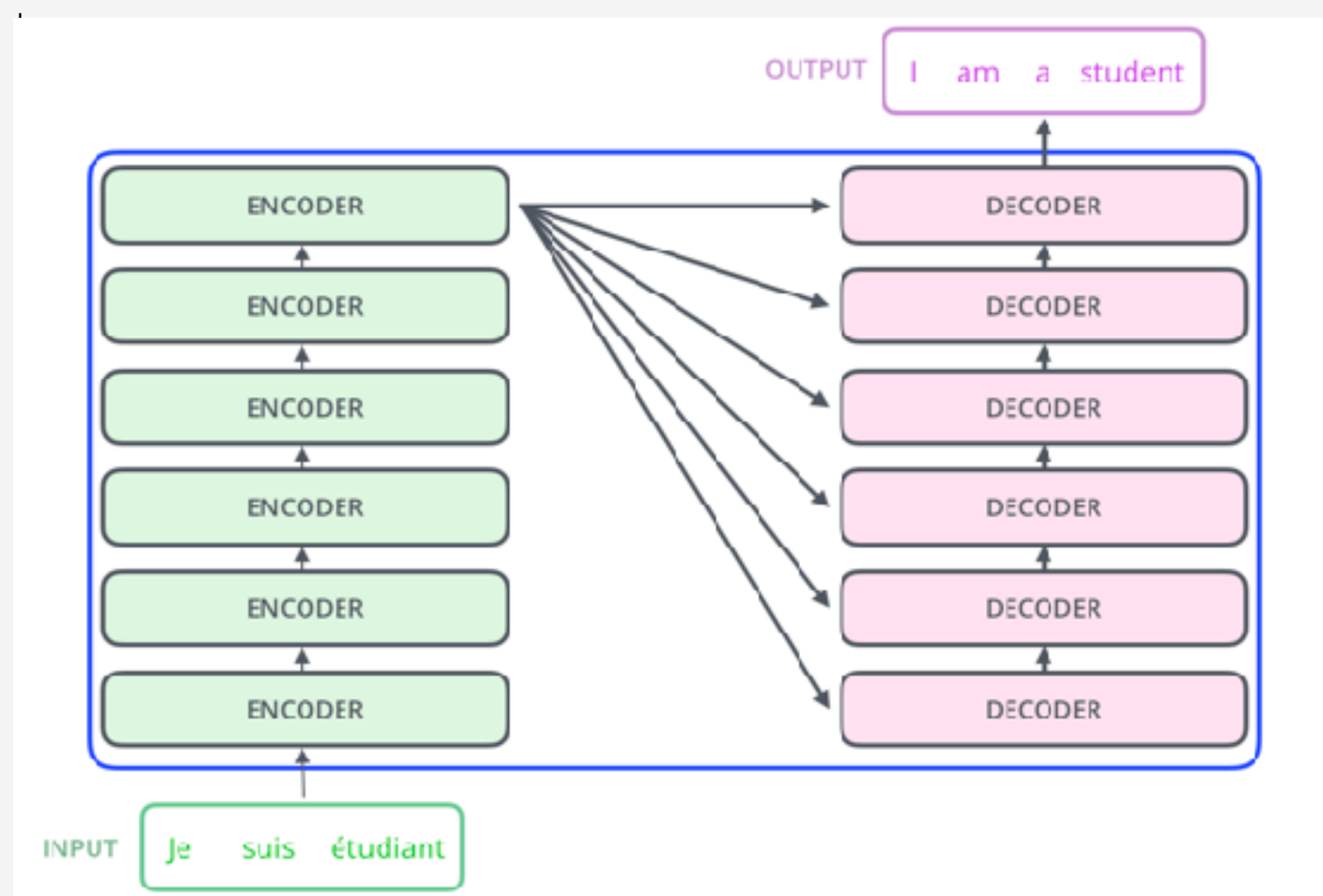


## 2024- : NEURAL-SYMBOLIC AI EMERGES

The inherent limitations of deep neural networks (error-prone, build models on biased training data but no ability to “understand” contextually, hence scary ethical considerations) has given rise to models called “hybrid”. These neural-symbolic architectures integrate the autonomous learning of deep learning with the structure and contextual richness of human-drawn “knowledge graphs”. This allows ML models to cross into real intelligence (from simply just learning and regurgitating) by creating contextual knowledge. It also makes them more transparent.



# WHAT IS HAPPENING IN THE AI FIELD RIGHT NOW?



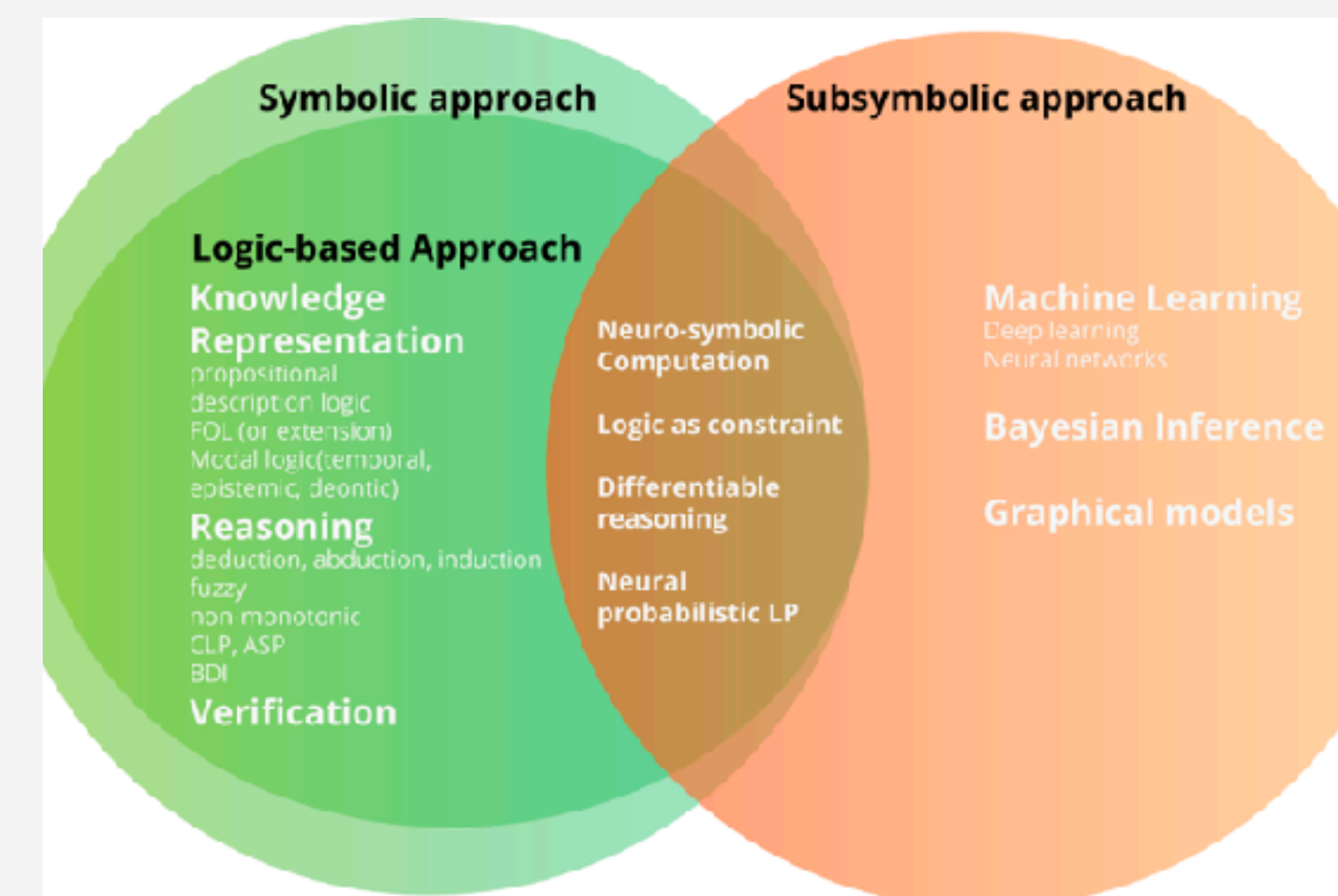
## ML METHODS ARE BECOMING MORE SOPHISTICATED

Enormous \$\$\$ spent + talent = rapid innovation = transformers + Reinforcement Learning + Human input = highly capable applications (LLMs, text-to-image, text-to-video, text-to-audio). Machine learning researchers are getting more and more creative and mixing models and architectures (transformers are an example). This has accelerated the development of human-ready AI applications. The ability for generative models to write computer software, for example, is potentially very disruptive.



## LOTS OF LIMITATIONS, ETHICAL QUESTIONS, AND CONFUSION ABOUT WHAT'S NEXT

Models are still too inaccurate to be fully trusted and integrated into products. Lots of ethical questions, and lots of confusion about how to bridge the chasm between sophisticated learning and true intelligence. Copyright lawyers are sharpening their knives. Regulators are going to step in. Traditional organizations are nowhere near ready. Media corporations need to move forward now, but carefully.



## BUT HYBRID METHODS ARE EMERGING AND WE NEED TO GET READY

Deep Neural Nets + Knowledge Graphs + Human-Built Symbolic Reasoning are going to accelerate the capabilities of traditional ML systems. In other words, machines will contribute scale in computation (still out of reach for humans) and humans will contribute nuance and context (still out of reach for machines). The hybrid human-machine continuum has started, and new skills are required to manage it.



# S

## STRENGTHS

- Generative AI can automate or augment many workflows in the media creation process.
- From color correction to dubbing, pre-visualization, in-camera VFX, translation, upscaling, SEO, it seems that new AI models build on the Transformer architecture have the potential to make media production quicker and cheaper.
- Generative AI models + knowledge graphs can be very powerful. For example, a ChatGPT-chatbot married to a Moral Knowledge Graph (to create awareness of what domains of conversation are off-limit) could be a major solution.

# W

## WEAKNESSES

- The models themselves are still fickle and unreliable.
- Data is still a mess. Data literacy is still not a priority in corporations.
- Media companies eager to use the tech will need large datasets that often extend beyond their own capability or content libraries.
- IP/legal or ethical implications are up in the air and could end up blocking all efforts to deploy the tech.
- Bad actors will be the first to use the technology, and regulators will eventually step in.
- GenerativeAI doesn't solve the media industry's #1 question: what do people want to see?
- AI is still very expensive and experimental and the media industry has bigger problems.
- Corporate organizations are outdated and still aren't ready to fully absorb such an expensive, experimental, long-term, and disruptive technology.

# O

## OPPORTUNITIES

- Opportunities abound, from automating micro-workflows within editing, post-production and CGI to letting machine learning models loose on creating entire scenes from text or image prompts, or automating large chunks of the CGI workflow.
- The technology also opens up new creative avenues: voice synthesis can replicate any voice, facial replacement technology can make face blurring in documentaries a thing of the past. Music synthesis can create a score in mere hours. De-aging opens up new narrative possibilities, etc.
- Digital authentication and watermarking will be a major opportunity within the media industry.

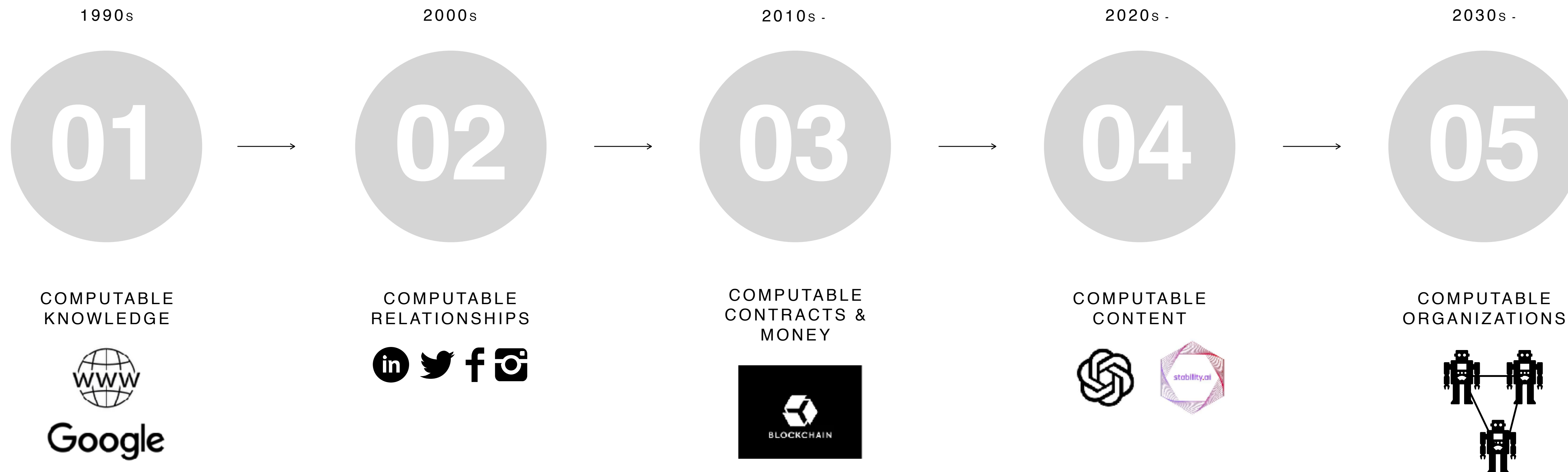
# T

## THREATS

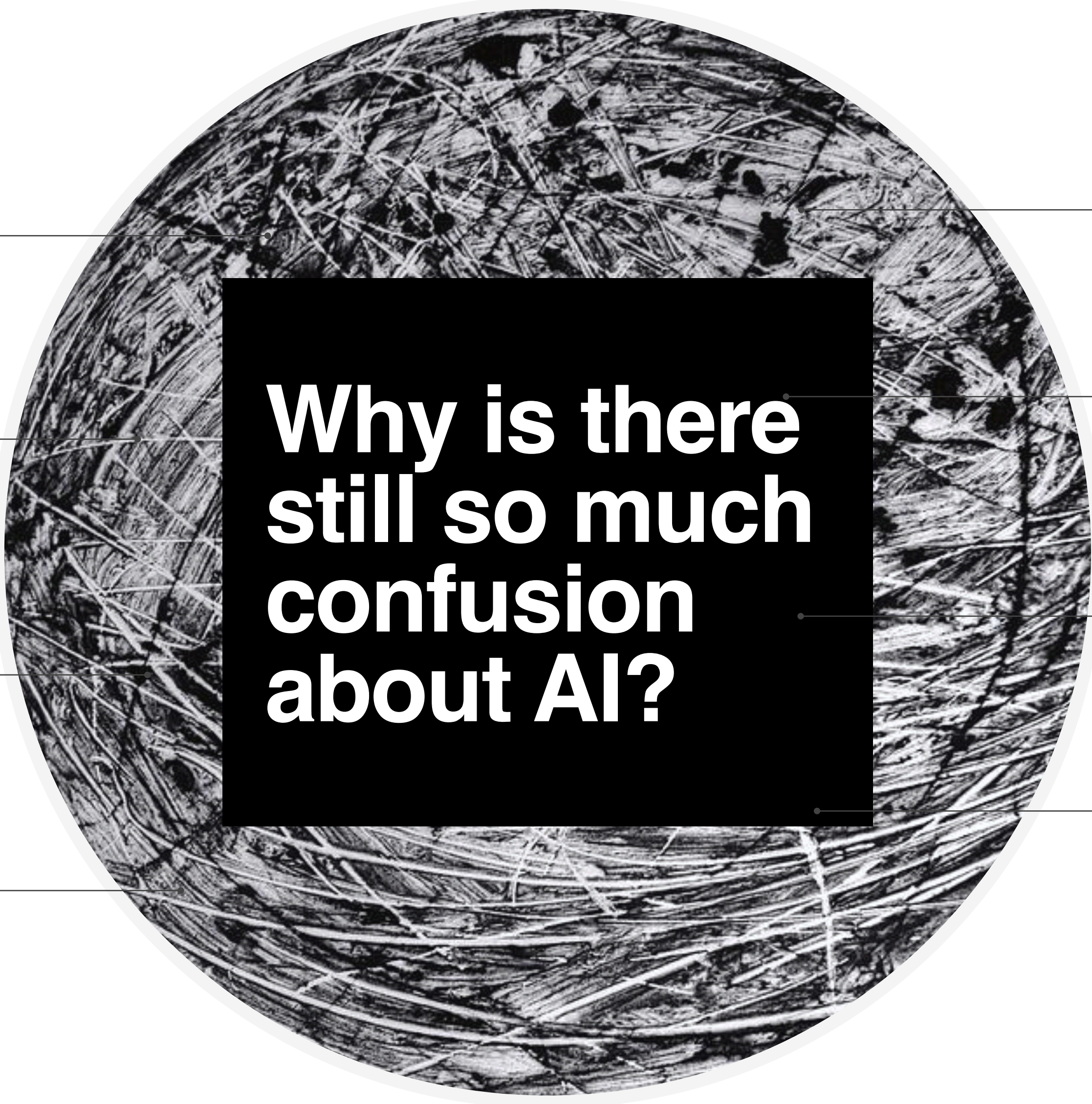
- Large-scale propaganda is now at the push of a button and in everyone's hand.
- This will attract negative attention to the technology from the public and regulators.
- Lots of projects will fail, because it's in the nature of such frontier technology.
- If successfully implemented, technicians will need re-training.
- Copyrights may be violated *en masse* with little to no recourse.
- Nobody knows the impact of generative AI models' ability to autonomously write computer code. AI agents creating better AI agents is a real threat.
- Oceans of free content will become galaxies of free content, creating a serious curation and trust problem for consumers. The economics of attention will become the economics of reputation.



## ZOOMING OUT: WE ARE IN THE ERA OF “COMPUTABLE EVERYTHING”







# Why is there still so much confusion about AI?

AI tech is accelerating

AI tech is becoming more complex/hybrid/harder to build

AI tech is still experimental & expensive

Data is still a mess (fragmented, no unifying ontologies)

AI talent takes 3-6 years to educate and train

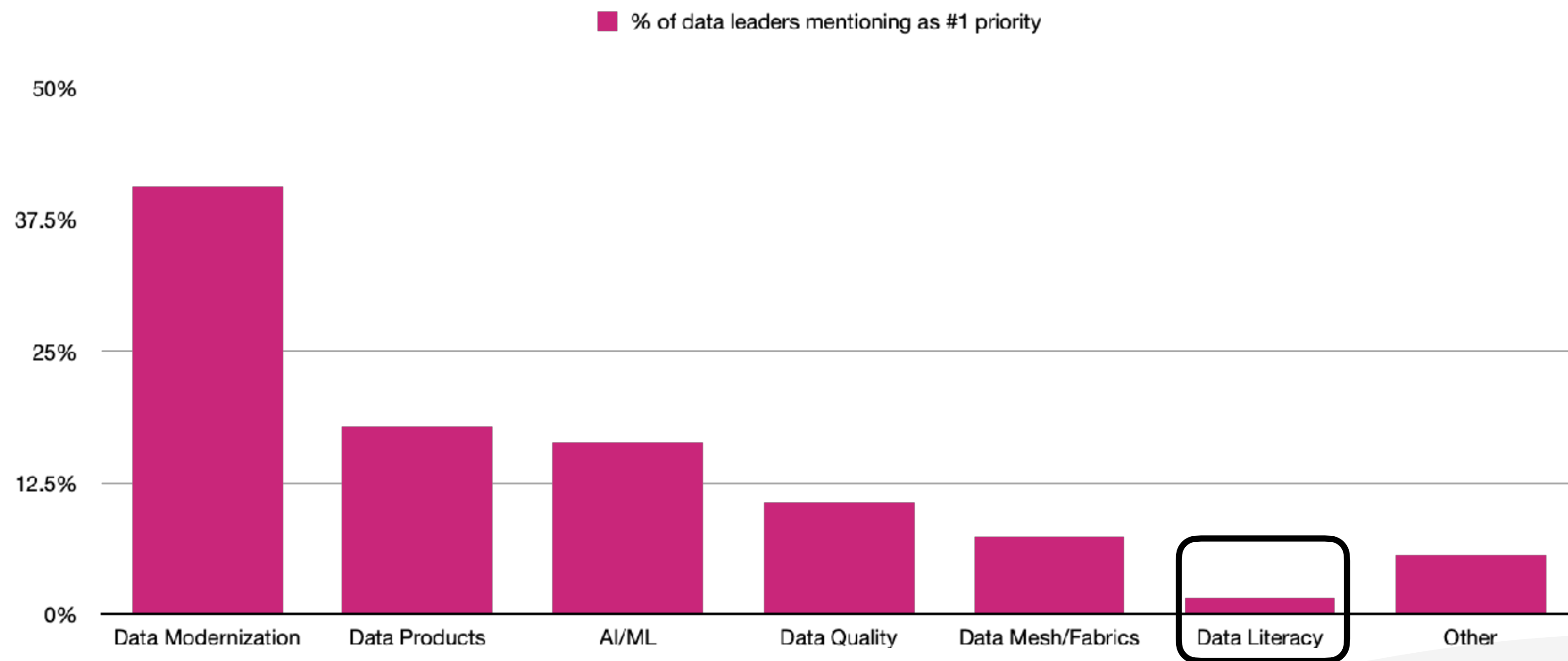
Lots of competition for scarce talent=\$\$\$\$ + short tenure times

Media industry doesn't have a software culture

Media industry is going through a lot of reorganization



**ONLY 2% OF CHIEF DATA OFFICERS AND CHIEF ANALYTICS OFFICERS LIST INCREASING DATA LITERACY AS A TOP PRIORITY ... BUT IT'S THE MOST IMPORTANT THING**



**SURVEY: 1,000 CDOS & CAOS FROM FORTUNE 1000 CORPORATIONS**

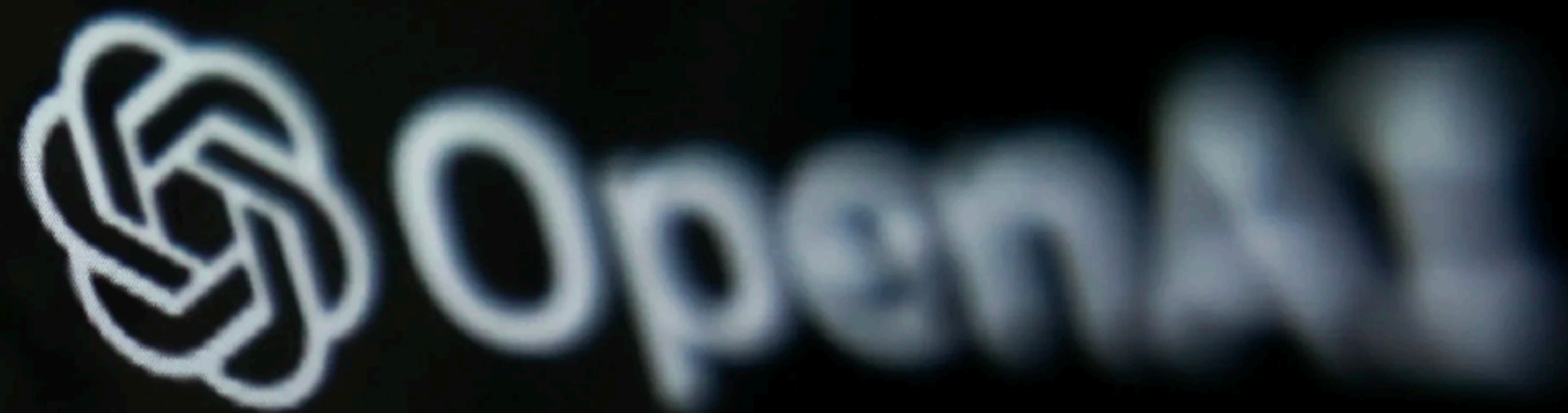
**“DATA & ANALYTICS LEADERSHIP ANNUAL EXECUTIVE SURVEY 2023”,  
NEW VANTAGE PARTNERS, JANUARY 2023**



**BUILDING AI IN ENTERPRISE TODAY IS:**  
**TRYING TO IMPLEMENT A 22ND**  
**CENTURY TECHNOLOGY**  
**ON 21ST CENTURY ARCHITECTURES**  
**FOR 19TH CENTURY ORGANIZATIONAL**  
**MODELS.**



ChatGPT



### 3. CHATGPT: - A HYPE-FREE PRIMER



# CHATGPT IS ... HYPERSCALE PARROTING

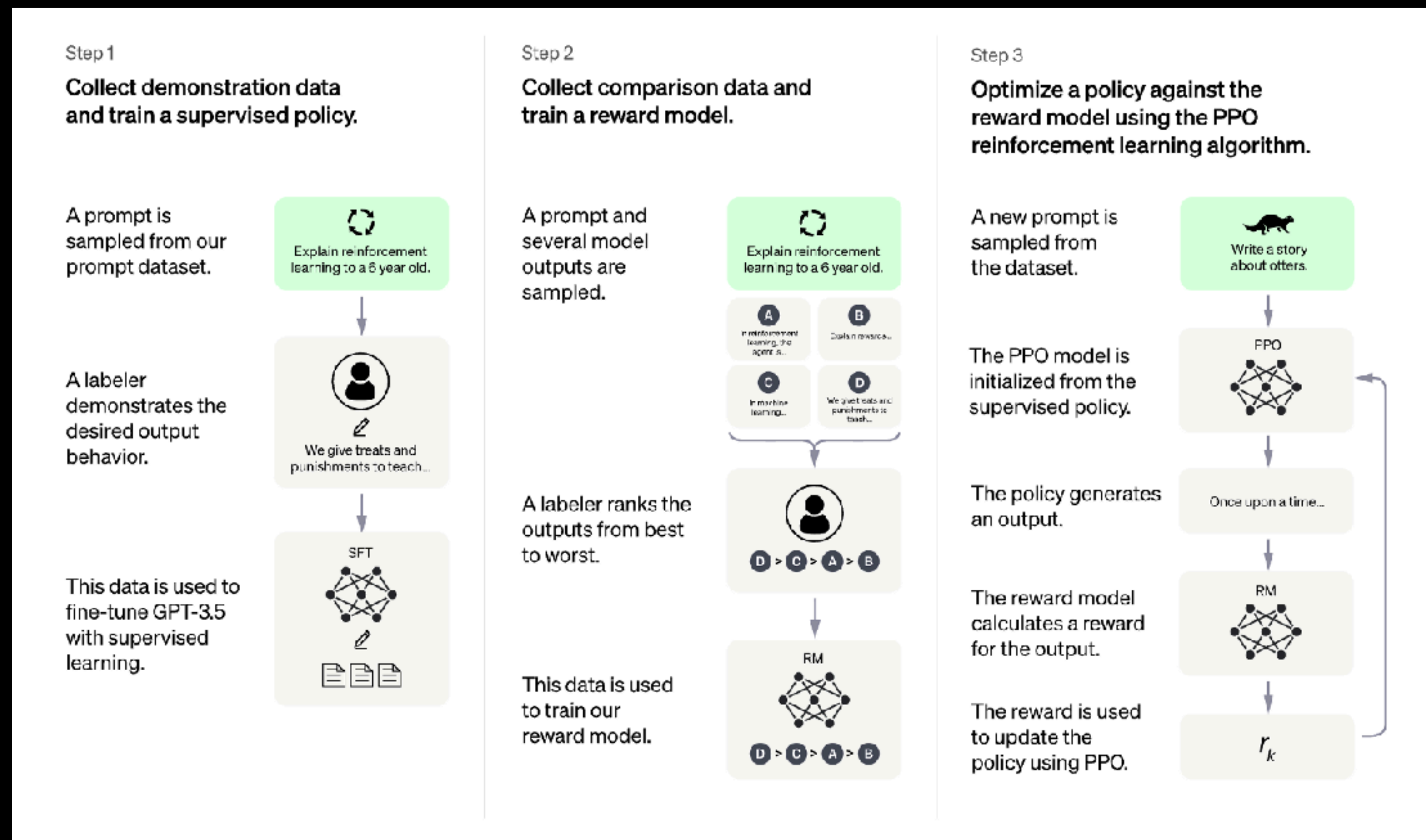
ChatGPT is a version of OpenAI's latest Large Language Model (LLM), GPT-3.5, optimized for dialogue with humans. It is a landmark in the history of artificial intelligence, but not as much of a revolution as many say.

It's a new generation of a Natural Language Processing (NLP) method called a Large Language Model. LLMs use their gigantic training sets (big corpus of text) to guess the probability that one word, or part of word (called a token in NLP), will come after another. Over and over again. The model generates new paragraphs of often grammatically (but not narratively) coherent text. LLMs are part of a domain called "generative AI".

The method behind ChatGPT is interesting in that it mixes large-scale supervised machine learning learning (LLMs are trained on a sophisticated type of deep neural network called a "transformer") and human fine-tuning.

OpenAI used a method called Reinforcement Learning through Human Feedback. RLHF is a method where human analysts prompt GPT-3 and manually "reward" the response based on how "aligned" it is with the human intent (and make sure the output is ethical).

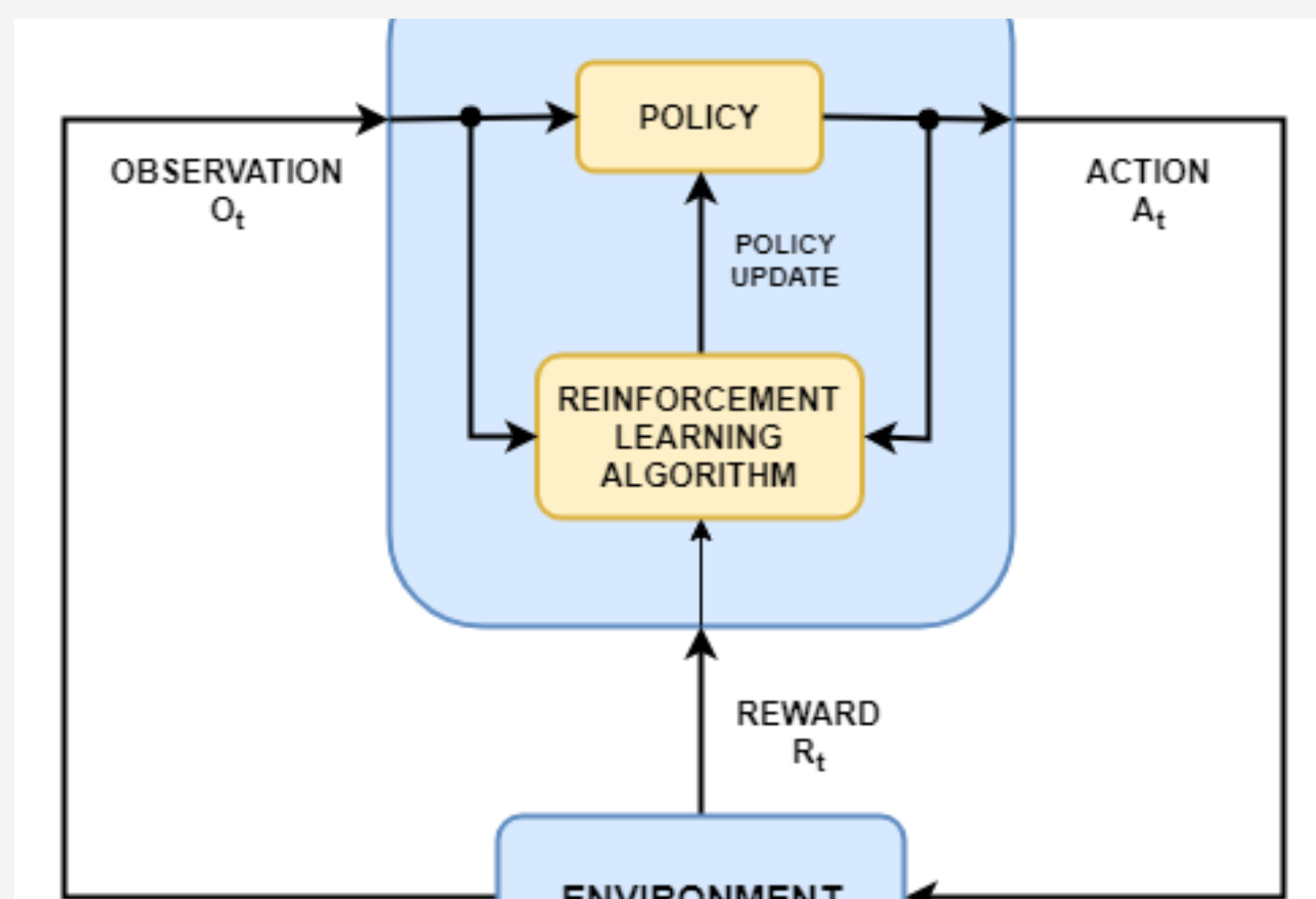
OpenAI doesn't "write" content as much as assembles it statistically based on a human prompt. Since it's trained on a large sample of text, it highly reflects the underlying training set. It is more hyperscale parroting than writing.



Source: OpenAI.



## WHY IT'S IMPORTANT



```

<?php
// Replace "example.com" with the hostname you want to scan
$host = "example.com";

// Loop through common ports (1-1024) and try to connect to each
for ($port = 1; $port <= 1024; $port++) {
    // Create a new socket
    $sock = socket_create(AF_INET, SOCK_STREAM, SOL_TCP);
    // Set the socket to be non-blocking
    socket_set_nonblock($sock);
    // Try to connect to the port on the host
    $connection = socket_connect($sock, $host, $port);
    // If the connection is successful, the port is open
    if ($connection === true) {
        echo "Port $port is open\n";
    }
    // Close the socket
    socket_close($sock);
}
  
```



## IT'S A PROMISING HYBRID

The combination of transformer neural nets trained on large training sets and human-driven reinforcement learning promises to make traditional machine learning methods a lot more accurate and useful in high-stakes environments. More “humans in the loop” means higher performance, accuracy, and more usability.

## IT'S GREAT AT A FEW THINGS

ChatGPT has shown impressive capabilities in many areas of text generation, including writing emails, book reviews, summaries, etc. It's also good at writing and fixing computer code, which could be a revolution in how (and how quickly) software is written. But this could also pose serious ethical and security risks.

## IT'S GOING TO GET BETTER

OpenAI has already hinted at the release of its next-generation LLM, GPT-4, which is likely to be orders of magnitude better than GPT-3. “Human in the loop” tuning is extremely useful to increase model performance. However, no amount of tuning will make the GPT generation of LLMs capable of truly understanding text and computing human symbols, which are core to narrative creation.



# WHERE IT'S LACKING

## LIMITED DOMAIN



ChatGPT only performs highly in the domains it's been specifically "human-tuned" in. There's a lot of them, but far from all. Its intrinsic limitations also make it impossible to articulate basic narrative beyond a few paragraphs. And when prompted outside of its trained domain, it makes a lot of mistakes.

## DOESN'T "UNDERSTAND" ANYTHING



ChatGPT is very skilled at outputting basic, low-narrative content, such as an email, website copy, or a press release. It's a giant statistical engine that predicts sequences of words. It doesn't comprehend the concepts or symbols present in its output. It can't abstract or reason in very basic ways. It doesn't understand anything about the world it's in, especially causality.


## STILL JUST DEEP LEARNING



Despite its human in the loop component, ChatGPT uses the same base methodology that has dominated the machine learning field for the past 10 years: deep neural networks. That method is very good for a number of tasks, such as statistical modeling of highly dimensional fields (like language or images), but it's not intelligence. The field of AI still can't agree on how to take deep learning to the next step of building actual thinking machines.



## CHATGPT MYTHS AND REALITY

MYTHS		REALITY	
	ChatGPT is close to Artificial General Intelligence (AGI).		Not even close. Machine learning is just one part of intelligence, and nobody's really figured out the rest. An AGI application is a single AI framework capable of performing at or above human-level in a variety of different domains, such as driving a car, trading stocks, or learning a language. The human brain is one architecture that does all of that. ChatGPT doesn't. Experts can't even agree on how to build AGI. What's called "AI" is almost always not even AI. It's machine learning.
	90% of content will be machine-made in 2, 3, 5 years.		This statement makes no sense ("content" means a million different things), but even if it did it would not be accurate. ChatGPT will indeed allow anybody to create simple and boring text on a massive scale, and it will affect fields like search engine optimization and social media publishing. Bots will rule until countermeasures are developed and/or regulators step in (only a matter of time).
	ChatGPT, and generative AI in general, will replace writers and creatives.		Unlikely. ChatGPT doesn't have any ability to even understand the basic tenets of a story, let alone build one. Its output is too basic to be even interesting. Synthetic image generation is staggeringly good, and can produce images that could be true works of art. But the point of art is equally the art itself and the artist's persona and brand. What makes art valuable is the rebellion and talent of a human reaching into deep and previously unknown areas of the human condition.



# S

## STRENGTHS

ChatGPT is extremely good at writing basic, boring, and bad text, and humans do a lot of that. Basic emails, text messages, average high school essays, basic customer service interactions, website copy, press releases ... can all be written by the application. The auto-suggest function on email and text messages will get seriously enhanced. It's freakishly good at parroting writing styles, which is impressive and entertaining. The model also does a good job at writing and fixing computer code, which could be massively disruptive.

# W

## WEAKNESSES

ChatGPT cannot perform highly in domains that it has not explicitly been trained and tuned on. It cannot write a novel, or a script, or any kind of text that requires an understanding of the world and its nuances. It's a complex and highly tuned statistical engine that doesn't actually "know" or "understand" anything. It can't write engaging or even slightly narrative text beyond a few paragraphs. It can only have "good ideas" by accident.

# O

## OPPORTUNITIES

ChatGPT will allow its users to write a lot of basic or bad text very quickly, cheaply, and on a massive scale. The main opportunity for it right now is SEO, where writing a lot of copy (blogs, websites, etc.) is key to create a lot of links and jack up search engine rankings. Another use is creating bot content on social media on a massive scale. In the media industry, ChatGPT can be used in combination with other generativeAI systems to more quickly create pre-vis assets like storyboards and schematics.

# T

## THREATS

ChatGPT is mostly useful for nefarious actors. Creating fake content attributable to real people will get a lot easier. Gaming search rankings and social media metrics will become a "push of a button" function. Areas like digital watermarking and bot detection will be critical to track authenticity. Anybody working in a low level editorial position or customer service position will be seriously disrupted. Chatbots will get much better. And just like the explosion of musical content shifted the music market towards live experiences, the explosion of video content could shift video entertainment towards in-person experiences, including parks and (yes) theater.



# WHAT IT MEANS FOR THE MEDIA INDUSTRY

## 01 YOUR JOB IS SAFE

ChatGPT is fresh and still being iterated, but the capabilities displayed so far aren't a threat to anybody in the media industry. The AI apps that would create (or even optimize) deep narrative content haven't been invented yet. Experts can't even agree on how to build them.

## 04 VOLUME DOES NOT MEAN AWARENESS

Marketing functions pivoting on search engine optimization or social media campaigns will need to adjust how they measure success. They will need to beef up their ability detect bots and fake accounts.

## 02 AI-AUGMENTED PRE-VIZ?

ChatGPT will likely affect some pre-production, production and post-production workflows. Things like pre-viz will become a lot more augmented by AI.

## 05 GOVERNANCE WILL BE KEY

AI ethics is going to rise up even further as a concern for those using AI applications. Bad actors will try to do nefarious things with it. "Content Authenticity Tech" will become a big area of opportunity. And for those using synthetic media, transparency and disclosure will be required.

## 03 ACCELERATION OF CERTAIN WORKFLOWS

Creative iteration could get a lot easier and faster. And that could be a new way to work. Generative AI models will be powerful (but still pretty dumb) assistants for creatives. Putting a look book together will become a lot easier and faster. Some parts of writing, such as log lines, will become semi-automated.

## 06 IT'S TIME TO LEARN ABOUT AI

One thing is certain: AI is here. And while it won't likely replace many jobs in the foreseeable future, it's going to increasingly become a part of our industry's workflows. Like computer-based text editing in the 1980s, it will be a more and more capable tool we use more and more.



## THE BEST WAY TO UNDERSTAND CHATGPT IS TO USE IT A LOT

This is a consistent reality in any and all AI methods and applications: the technical stack running in the background matters less than what it can do, and how much impact it has on our lives and on business workflows.

In so many ways the recent past of AI research has generated an enormous amount of papers and new methodologies ... and a comparatively small amount of actual applications.

This is because the crux of AI isn't the technology, it's aligning the technology with human use cases, budgets, and organizational dynamics (short-termism, linear thinking, fear of failure).

The future belongs equally to those who can build AI/ML applications and to those who know when to use them (or not use them) and how to use them.

There are less people in the second category than in the first. And virtually no education program to groom them.





## 4. WHAT DOES THIS MEAN FOR THE MEDIA INDUSTRY?





## GRADUAL BUT SUBSTANTIAL CHANGE

The past 12 months have seen the development of methods and applications that will accelerate the insertion of machine intelligence in key areas of media production.

Besides models being rolled out by large technology companies such as Google, Adobe, Meta, and Microsoft, billions in venture capital funds are being poured into startups, which products will profoundly affect media production.

This will likely shift the landscape of technology tools applied to media production, and put pressure on content producers and distributors to develop new technical competencies as well as find a place for their own innovation in this complex landscape.

As such, we see the majority of investment and innovation coming from technical vendors with large budgets for machine learning and product development expertise.

Studios and content producers don't have a software development culture, and should focus on partnering with startups to leverage their own assets (training data) to increase their competitive advantage in the most valuable area of the Generative AI, and something they already know: connecting to audience tastes and curating content for them.



## WHAT IS THE FUTURE?

In the next few years dumb money will go towards “ChatGPT applied to X” startups. This will create glut of content generation startups, and a galaxy of free and commoditized content (explosion of supply, demand still stable because there’s never more than 24 hours in a day).

Smart investment money will go where the opportunity really is: content curation, recommendation and personalization using content data and audience data (social media, streaming data).

Explosion of content supply + flat demand =  
**NEED FOR PERSONALIZATION AND CURATION.**

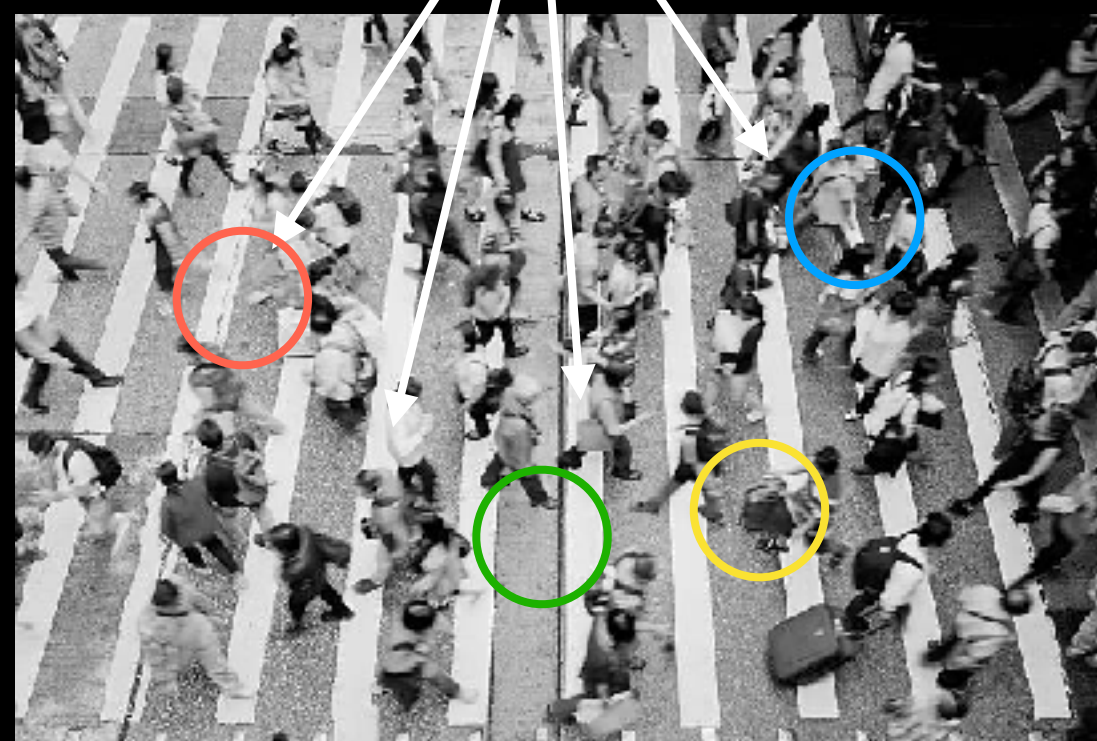
## IN THE FUTURE ...

Highly Automated Media Organizations...

... will craft and distribute programmatically ...

...Personalized, Highly Curated, and Integrated (Metaverse) Content ...

... To connected & overwhelmed audiences, one person at a time (“addressable media”).



**AI winners:** software companies and creatives, studios which know how to make AI trustable and retrain their employees for “AI augmentation”.

**AI losers:** any work that doesn’t require either “connecting the dots” of audience data or speaking directly to the human soul.

**AI winners:** studios who own their distribution platform and detailed audience data who can use ML to understand what attributes of content resonate with what audience segments.

**AI losers:** those who don’t own the distribution platform (minute by minute audience viewership or gameplay data).



## GENERATIVE AI TOOLS SURVEY: PRE-PRODUCTION

Use cases: ideation, log lines, research, automation of correspondence or FAQs, chatbot dialogue generation.

Jasper  
CopyAI  
ChatGPT  
BARD (Google)  
LLaMa (Meta)  
ChatLLaMa (Nebuly)

01

### LANGUAGE GENERATORS VIA LARGE LANGUAGE MODELS (LLMS)

Natural Language Processing models that allow for large-scale generation of grammatically and contextually coherent text. Need lots of training data, compute, and human tuning.

Use cases: pre-visualization, storyboards, look books.

### IMAGE GENERATORS

Text-to-image tools able to generate sophisticated, style-specific images from text prompts.

02

Dall-E2	MidJourney	ArtBreeder
Stable Diffusion	Deep Dream	PhotoSonic
ControlNet	Starry AI	BigSleep
Cuebric	Fotor	eDiff-I (NVIDIA)
Craiyon	NightCafe	GauGan2 (NVIDIA)



# GENERATIVE AI TOOLS SURVEY: PRODUCTION

Use cases: realistic + semi-autonomous digital characters, facial replacement technology (“deepfakes”), de-aging, motion capture, tuning facial expressions for dubbing.

01

**GENERATIVE VIDEO**  
  
Similar method than image generation: these models can generate a short video from a text prompt.

DeepFace Lab	Synths Video	RunwayML	Meta’s Make-a-Video
Talking Faces	<a href="#">veed.io</a>	Synthesis	Synthesia
GET3D (NVIDIA)	DeepSwap	Elai.io	Pictory
Ganverse3D (NVIDIA)	FaceSwap	InVideo	DeepBrain AI

Use cases: in-camera visual effects from Lidar data.

**SIMULCAM**  
  
Lidar data can be used to train models to do live compositing of virtual elements with live-action.

02

WETA’s own model



## GENERATIVE AI TOOLS SURVEY: POST-PRODUCTION

Use cases: voice synthesis, translation and localization, ADR.

Vall-E      Whisper (openAI)  
Jukebox      Respeecher

01

### SPEECH-TO-TEXT / TEXT-TO-SPEECH

Machine learning models that turn text into speech (generative modeling) and speech into text (traditionally supervised learning, state of the art is now using LLMs).

Use cases: automate (or accelerate) rotoscoping, shoot without green screen.

### ROTOSCOPING/COMPOSITING

ML-enabled rotoscoping trains a supervised model on a large dataset of image and video to generate realistic shapes and keyframes.

02

SmartROTO (Foundry)

CopyCat (Foundry)

ElectricSheep



Use cases: automate repetitive tasks in VFX pipelines.

Gen-1 (RunwayML)

EBsynth

Flawless

03

### VIDEO-TO-VIDEO

Generate new video from a source video, or image, or text prompt (or all of the above) with style matching the video or image input.

Use cases: automate micro-tasks.

### EDITING

Train models to match style, color, supercharge auto-tagging, etc.

04

Sensei (Adobe)

Synthesia



## HOW WILL COMPANIES BUILD COMPETITIVE ADVANTAGE?

Generative AI will be seen and implemented differently throughout the media ecosystem.

This is tied to how much competitive advantage (and future revenue) can be extracted from the new tech, either through optimization or new feature/product development.

Here the main challenge is that the 3 main resources of competitive advantage-building Generative AI development (proprietary and plentiful data, high-ranking ML talent, and organizations willing/able to throw money at AI development) are unequally distributed within the media industry:

- Technical vendors (software), post-production & VFX houses, and camera manufacturers have the technical and product talent and budget but lack the training data.
- IP holders have the training data but (generally) not the ML talent. Studios are not software developers, it's a completely different culture (rewarding failure). Right now (this may change) they can't pay world-class ML talent salaries. The current M&A and fiscal environments aren't conducive to major ML efforts.

### COMPETITIVE ADVANTAGE

FEATURE  
AUGMENTATION  
AUTOMATION

PRODUCT  
DEVELOPMENT

AUTOMATION  
TOWARDS COST  
REDUCTION

FEATURE  
AUGMENTATION

CONTENT CURATION

TRAINING DATA  
(CONTENT)

PRODUCT  
DEVELOPMENT (FILM-  
TV-VIDEOGAME-  
METAVERSE)

### CORE SKILL

HARDCORE  
ML/MATH  
UX/PRODUCT

BUT: TRAINING  
DATA? LEGAL  
ISSUES?

HARDCORE  
ML/MATH

UX/PRODUCT  
BUT: TRAINING  
DATA? LEGAL  
ISSUES?

HARDCORE  
ML/MATH

UX/PRODUCT  
BUT: TRAINING  
DATA? LEGAL  
ISSUES?

DATA UNIFICATION

KNOWLEDGE  
GRAPHS

MODEL  
MANAGEMENT

ETHICS

BUT: ML / HACKER /  
DATA TALENT?

LEGAL ISSUES?



Panasonic SONY Canon





## 5. WHAT ORGANIZATIONS AND SKILLS DO WE NEED TO SURVIVE AND THRIVE?



## SOFT SKILLS RULE?

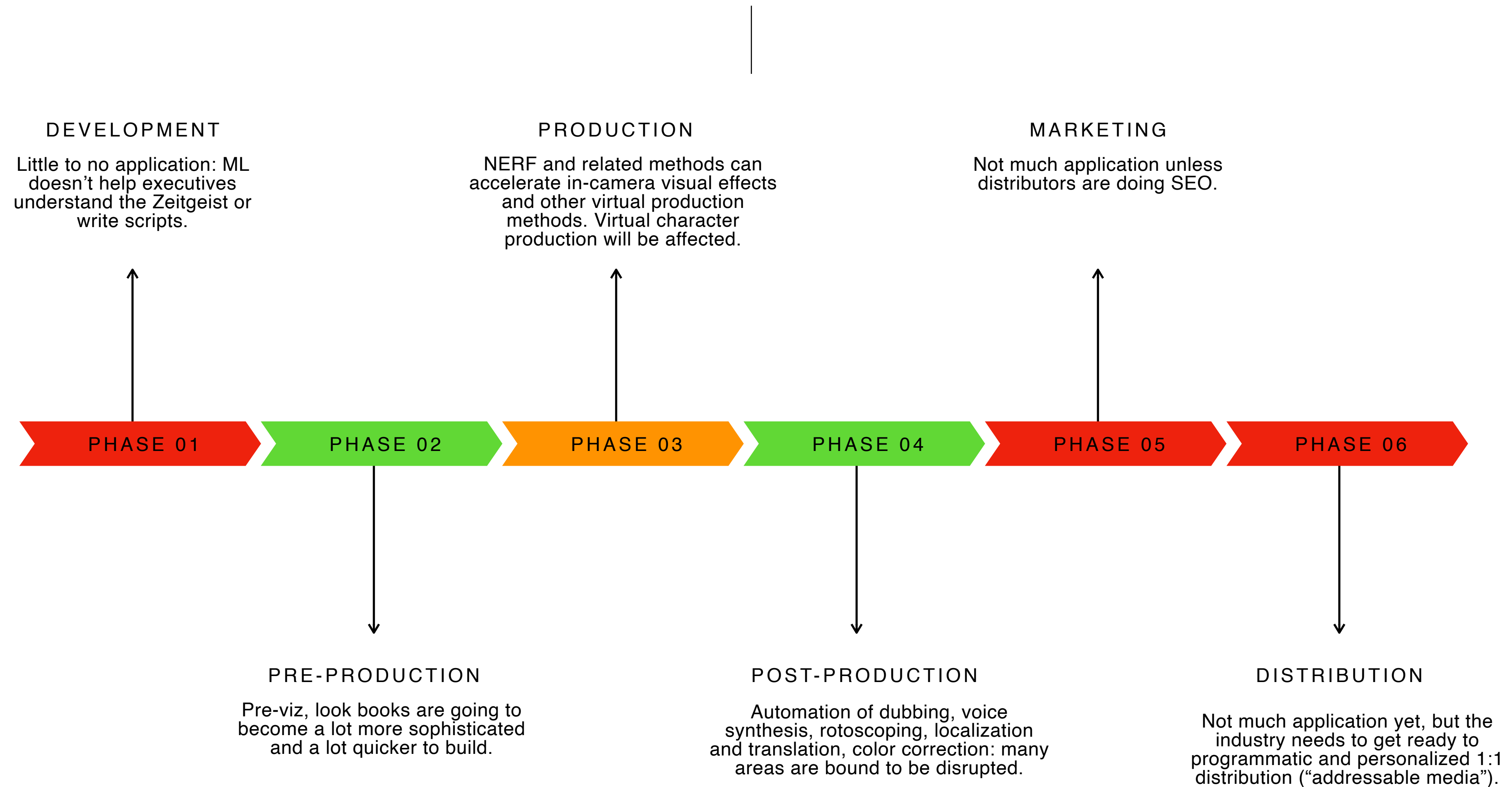


Moving forward, there will be 4 categories of AI talent:

- (1) AI engineers with PhDs (math focus) and a research background who can develop new models,
- (2) AI engineers with software development expertise (computer science focus) who can build products. These will get commoditized and offshored over time.
- (3) AI engineers with a business (or product development) background who are the interface between the data science function and the C Suite. They can effectively break down business problems in terms of data (for the data science team), as well as communicate to business stakeholders about AI (for the C Suite). We call them “hackers” because they’re scrappy, computational thinkers obsessed with solving business problems with data and computation (AI or not).
- (4) Senior technical executives who have a deep understanding of AI, what it can and can’t do, how to budget for it, plan for it, staff for it, talk about it, what ethical considerations need to be present, etc.



## WHERE WILL DISRUPTION HAPPEN MOST?





## BUSINESS & TECH ORGS MERGE: “THE HACKER” EMERGES

IN OUR AI FUTURE, THE TECHNOLOGY  
BECOMES EMBEDDED IN THE BUSINESS  
ORGANIZATION, AND VICE-VERSA





Deep AI knowledge:  
credible with the AI team

Can code but  
hates it, knows  
developers pet  
peeves

Curious problem-  
solver

Great speaking,  
writing, and  
presentation skills

## Who is the hacker? A profile

A data scientist who  
loves business

Hacker means loves to  
solve linear problems  
with computation

Knows how to fail  
without turning off the  
spigot

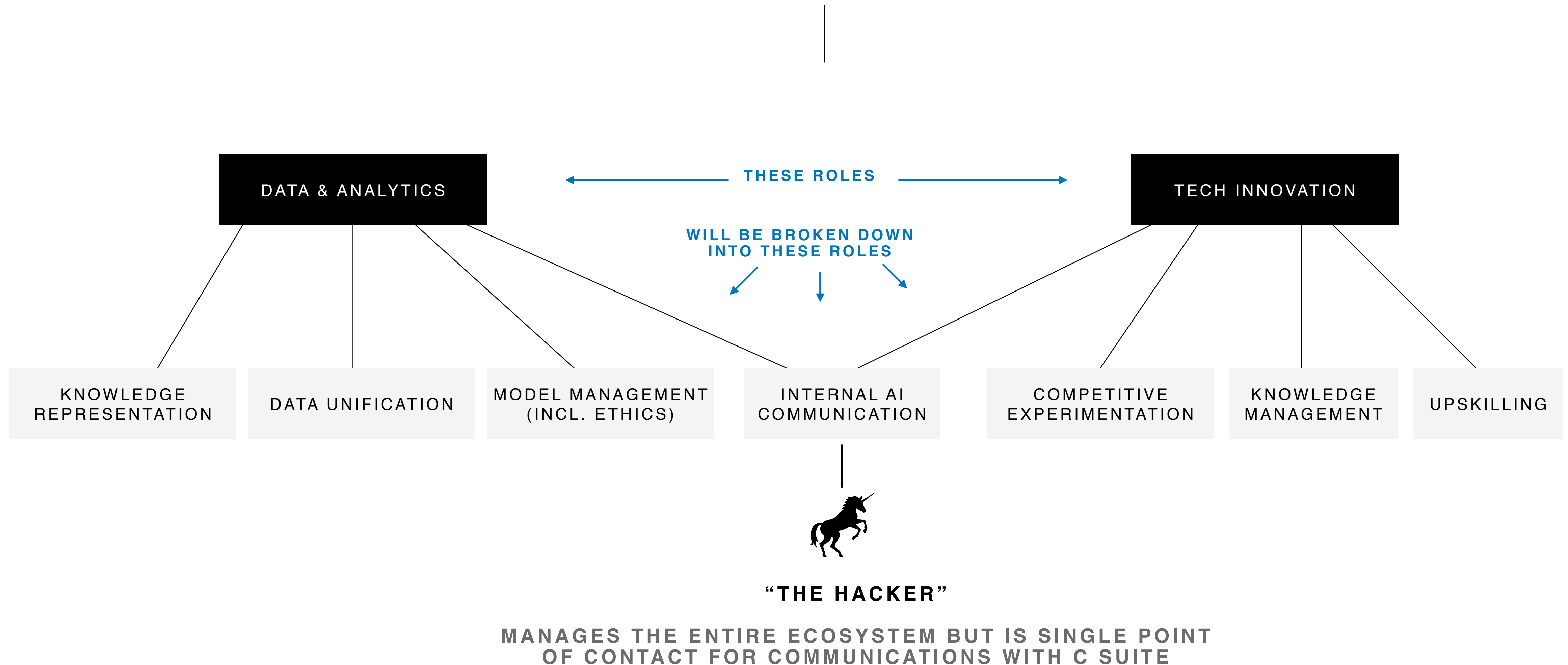
Strong grounding in AI  
governance & ethics

TRUST BUILDER

The Hacker is the quarterback of the data and AI function



## EXPANSION AND SPECIALIZATION OF INTERNAL DATA & TECH INNOVATION ECOSYSTEMS





## HOW AI GETS IMPLEMENTED IN THIS NEW PARADIGM

	STEP 1	STEP 2: PLANNING	STEP 3: LINING UP RESOURCES	STEP 4: MVP ROLLOUT	STEP 5: EARLY USER FEEDBACK	STEP 6: BETA ROLLOUT	STEP 7: BETA USER FEEDBACK	STEP 8: V.1 ROLLOUT
HACKER	GETS C SUITE GREENLIGHT	PROBLEM DEFINITION	C SUITE COMM: GOALS	LEAD PROJECT MANAGEMENT	C SUITE COMMS: ON TRACK? MORE \$\$?	LEAD PROJECT MANAGEMENT	USER FEEDBACK	LEAD PROJECT MANAGEMENT
DATA UNIFIER		WHERE IS THE DATA?	CLEANING/MERGING/ BUYING DATA	DATA OPS	DO WE NEED MORE/ BETTER DATA?	DATA OPS	DO WE NEED MORE/ BETTER DATA?	DATA OPS
KNOWLEDGE REPRESENTER		HOW TO TURN DATA INTO KNOWLEDGE?	HOW DOES IT FIT WITH ORG KNOWLEDGE?	KNOWLEDGE GRAPH BUILDING	IS KNOWLEDGE CONSISTENT & INTEGRATED?	KNOWLEDGE GRAPH BUILDING	IS KNOWLEDGE CONSISTENT & INTEGRATED?	KNOWLEDGE GRAPH BUILDING
MODEL MANAGER		HOW TO MODEL / WHAT RESOURCES?	MODEL CARD/ LABELING LINED UP	MODEL TRAINING/ MODEL CARD MANAGEMENT	IS MODEL ACCURATE?	MODEL TRAINING/ MODEL CARD MANAGEMENT	IS MODEL ACCURATE?	MODEL TRAINING/ MODEL CARD MANAGEMENT
COMMUNICATION LEAD		INTERNAL COMMS PLAN	HOW THIS IS ABLE TO GET JOB DONE	WHAT THIS IS GOING TO TRANSFORM	HERE IS WHERE IT COULD HELP / HERE IS HOW IT'S ETHICAL	WHERE THIS IS GOING TO TRANSFORM	HERE IS WHERE IT COULD HELP / HERE IS HOW IT'S ETHICAL	WHO THIS IS GOING TO TRANSFORM
UPSKILLING LEAD		HOW DOES THAT AFFECT OUR WORKFORCE?	EDUCATE WORKFORCE ABOUT GOALS	EDUCATE WORKFORCE ABOUT CAPABILITIES	TOWNHALL WITH MVP USERS & ALL AFFECTED	EDUCATE WORKFORCE ABOUT CAPABILITIES	TOWNHALL WITH MVP USERS & ALL AFFECTED	TRANSITION WORKFORCE TO HYBRID AI/HUMAN WORKFLOW
GOVERNANCE & ETHICS LEAD		WHAT ARE THE ETHICAL IMPLICATIONS?	GOVERNANCE PLAN: WHAT DO WE NEED TO MAKE SURE IT'S ETHICAL?	ETHICAL IMPLICATIONS (INTERNAL/EXTERNAL)	USER FEEDBACK: IS IT ETHICAL?	ETHICAL IMPLICATIONS (INTERNAL/EXTERNAL)	USER FEEDBACK: IS IT ETHICAL?	GOVERNANCE PLAN: WHAT DO WE NEED TO MAKE SURE IT'S ETHICAL?



01

COMPUTATIONAL  
THINKING

02

GRAPH DATA  
STRUCTURES &  
KNOWLEDGE GRAPHS

03

TECH NARRATIVE &  
COMMUNICATION

04

RAPID UPSKILLING

05

SYSTEMS THINKING (AI  
ETHICS / AI IMPACT)

06

UX DESIGN FOR AI



# HOW MUCH AI KNOWLEDGE DO YOU NEED?

	NO PROGRAMMING SKILLS					PROGRAMMING SKILLS		
	DEFINITION	INTRO TO DATA	ETHICS	MACHINE LEARNING 101	KNOWLEDGE REPRESENTATION	MACHINE LEARNING 201	BUILD A DEEP NEURAL NET	REINFORCEMENT LEARNING
C SUITE EXEC								
TECH EXEC								
POST-PRODUCTION EXEC								
PRODUCTION EXEC								
“THE HACKER”								
AI/ML SCIENTIST								

MACHINE LEARNING 101: LEARN BASIC CONCEPTS AND ALGORITHMS, RULES ABOUT DATA. LIGHT STATISTICS.

MACHINE LEARNING 201: LEARN ABOUT ARCHITECTURES (ESPECIALLY DEEP NEURAL NETWORKS) AND HOW TO IMPLEMENT THEM. HEAVY STATISTICS. INTERMEDIATE PROGRAMMING SKILLS.

KNOWLEDGE REPRESENTATION: LEARN ABOUT DATA, GRAPH DATA STRUCTURES, ONTOLOGIES, SYMBOLIC LOGIC, KNOWLEDGE GRAPHS. THE MORE MATH SKILLS (GRAPH THEORY, CATEGORY THEORY) THE BETTER.



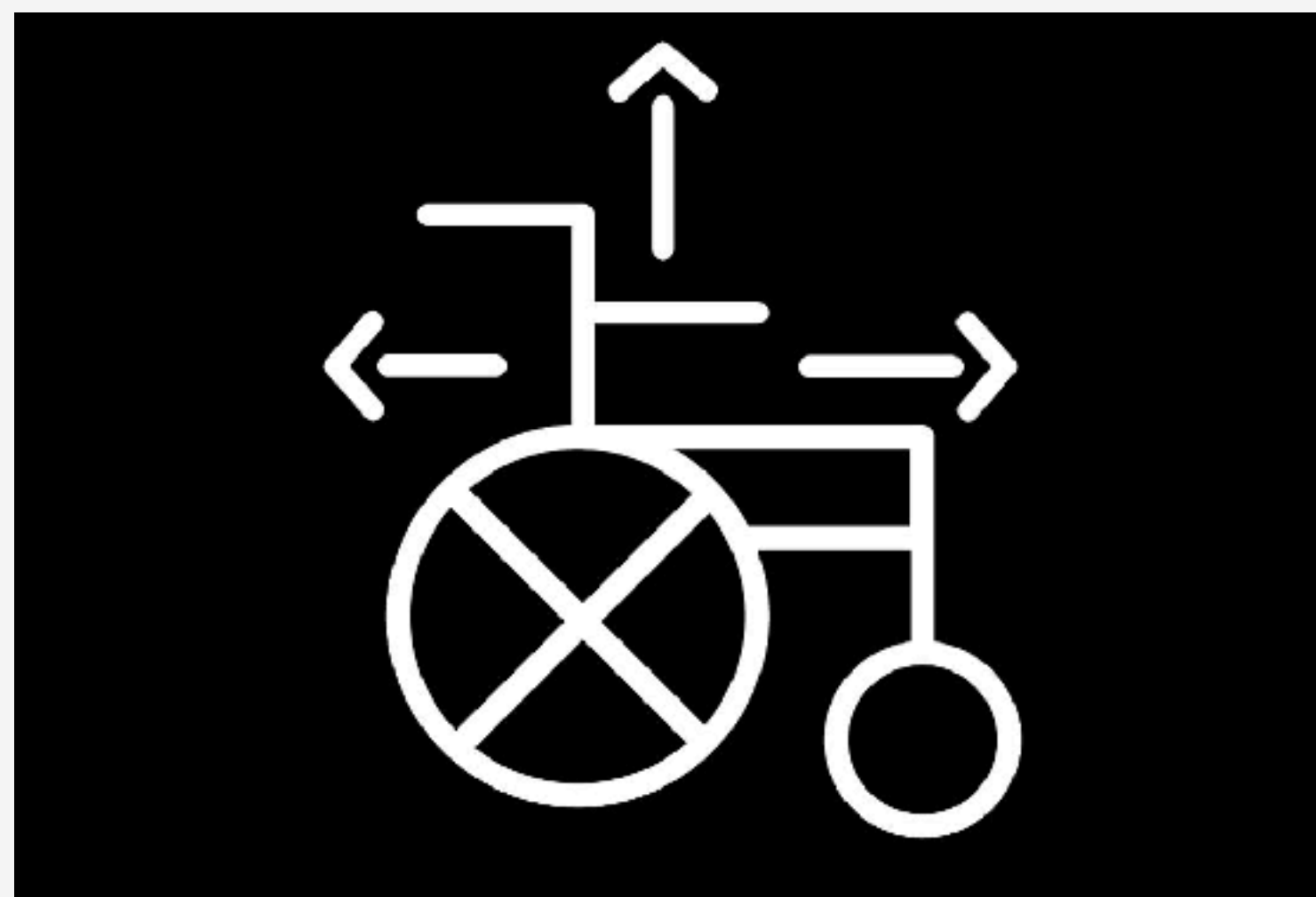
# WHAT ETC IS DOING TO HELP THE COMMUNITY



## INFORMATION & EDUCATION

Publications, events (AI Roundtables), private briefings to ETC members.

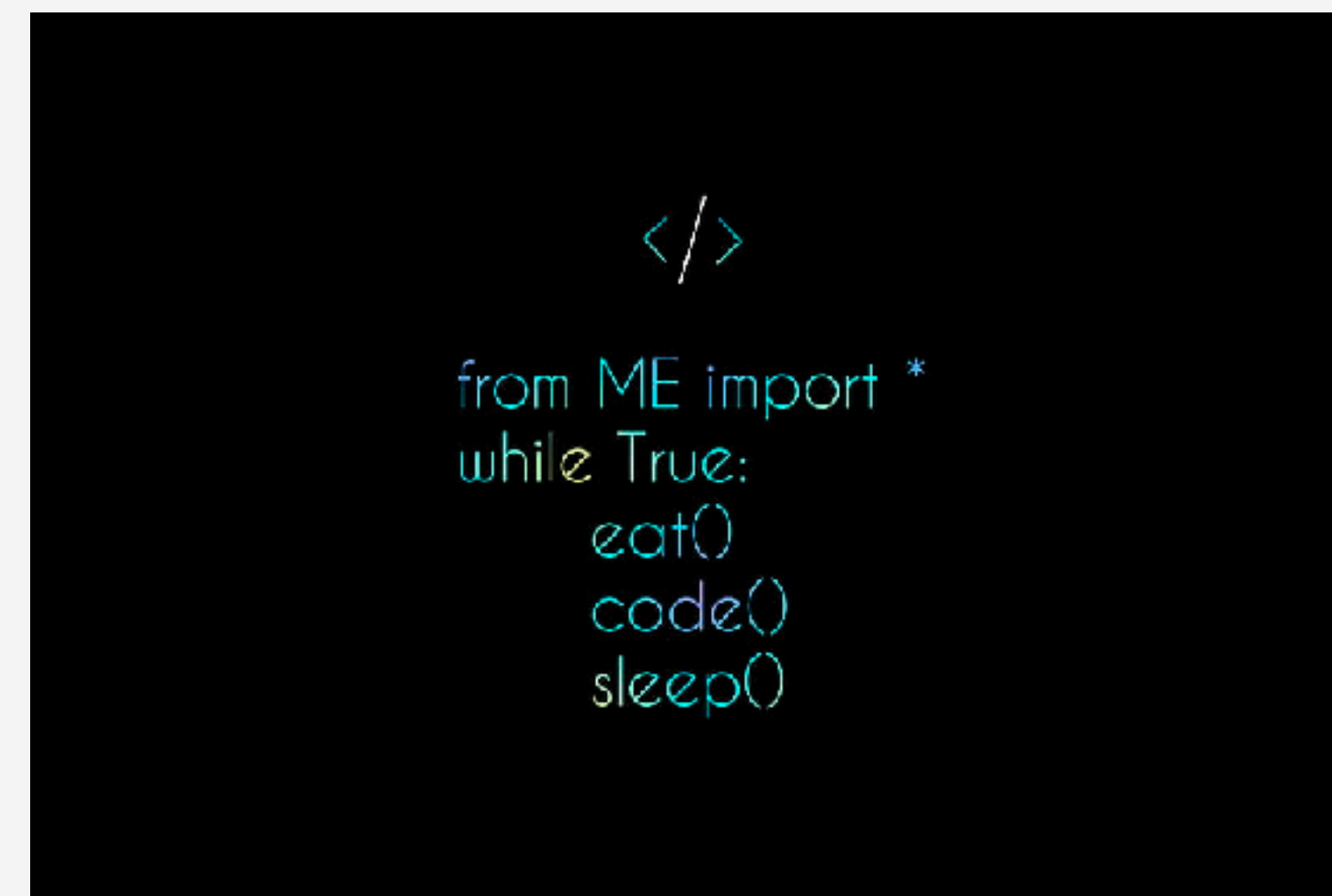
Course on AI for Media Executives (with SMPTE).  
Course on AI for Creatives (with SMPTE).



## STANDARDS

ETC-SMPTE Task Force on AI Standards in Media.

2023 Update to our White Paper on AI Ethics in Media (ethics of Generative AI).



## RESEARCH AND DEVELOPMENT

Putting together a watermarking POC, open to other ideas.

Project Mya: industry-wide visual training set.

Moral Knowledge Graph for ChatBots.



# GET IN TOUCH



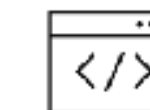
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