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LETTER FROM CHAIRPERSON OF THE BOARD

To those who dare to imagine and build the future,

ULTEK has long been the destination of choice for participants who are passionate about technology, eager to develop their skills, and ready to share their innovative ideas. After a five-year hiatus, we return stronger and more comprehensive than ever before — and it is my honor to welcome you to ULTEK, the 4th International Congress on Technology and Society.
Over three days, you will engage with distinguished scholars, share forward-thinking ideas, and contribute to knowledge that bridges technology and society. ULTEK provides not just a platform for sharing, but a space for action — where ideas become solutions and collaborations create lasting impact. Welcome to ULTEK'25 — where the future begins.

Nilgün Nihal Çalık,
Chairperson of the Board

LETTER FROM UNDER SECRETARY GENERAL&ACADEMIC ASSISTANT

Dear Delegates,

It is with great excitement and pride that we welcome you to ULTEK, the International Technology Congress. As the leadership team of the Generative AI Council, we are honored to take part in this groundbreaking event, where we will explore both the ethical and technical dimensions of generative artificial intelligence.
This congress is more than an academic exercise; it is an opportunity to refine your understanding, challenge your assumptions, and contribute to meaningful dialogue that could shape the future of technology. We expect every delegate to approach our sessions with curiosity, dedication, and a willingness to think critically about the challenges and opportunities this rapidly evolving field presents.
We would also like to express our sincere appreciation to one another for the encouragement and support that made the preparation of this conference possible. Our collaboration reflects the very spirit of what we hope this event will inspire — partnership, critical thinking, and innovation.

Should you need any assistance, clarification, or guidance at any point, please do not hesitate to reach out to us:

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We look forward to meeting each of you and witnessing the insight, energy, and creativity you will bring to our council. Together, let us make this congress an inspiring and impactful experience.
Warm regards,
Ömer Asaf Gümüş & Shaman Musa

Technical Aspect

1. Foundations of Generative AI

1.1 Definition & historical evolution

Definition :

Generative AI refers to a class of machine learning methods that create novels, text, images, audio, video, code, and more by learning patterns from large databases rather than classifying or predicting existing data. At its core, modern generative AI typically uses deep neural networks, including architectures like Generative Adversarial Networks (GANs), Variational Autoencoders (VAEs), diffusion models, and, notably, transformer based foundation models.

Historical Evolution :

1950s–60s (Beginnings) :

In the early days, AI focused on rule based systems and basic neural network models. Notable milestones include Arthur Samuel's machine learning checker program (1952) and Frank Rosenblatt's perceptron (1957).

In 1961, Joseph Weizenbaum introduced ELIZA, one of the first chatbot-style systems capable of generating rule based conversational responses.

1970s–90s (Expansion) :

Despite progress in expert systems and early AI, generative capabilities remained limited until the growth of computational power and data in the 1990s.

Statistical approaches like Markov chains began to be applied to text generation, and unsupervised learning techniques started to lay relevant groundwork.

2010s (Deep Learning Revolution) :

The introduction of GANs in 2014 enabled machines to produce photorealistic images for the first time.

In 2017, the transformer architecture (Attention Is All You Need) revolutionized succession modeling and set the stage for large scale language generation.

Late 2010s–2022 (Transformer Models & Foundation Models) :

OpenAI's GPT series began with GPT‑1 in 2018, followed by GPT‑2 and eventually GPT‑3 (175 B parameters) in 2020, showcasing impressive text generation capabilities.

Specialized models emerged for code generation (Codex), image creation (DALL·E, Stable Diffusion), video (Make‑A‑Video), audio (Jukebox), and others ushering in the era of foundation models capable of powering a variety of applications.

2022–Present (Rapid Growth & Foundation Model Dominance) :

ChatGPT's public launch in late 2022 highlighted generative AI's potential to the normal, activating explosive investment, research, and product development.

By early 2025, investments reached hundreds of billions, with projects like Project Stargate (OpenAI, SoftBank, Oracle) underlining generative AI's central role in global tech infrastructure.

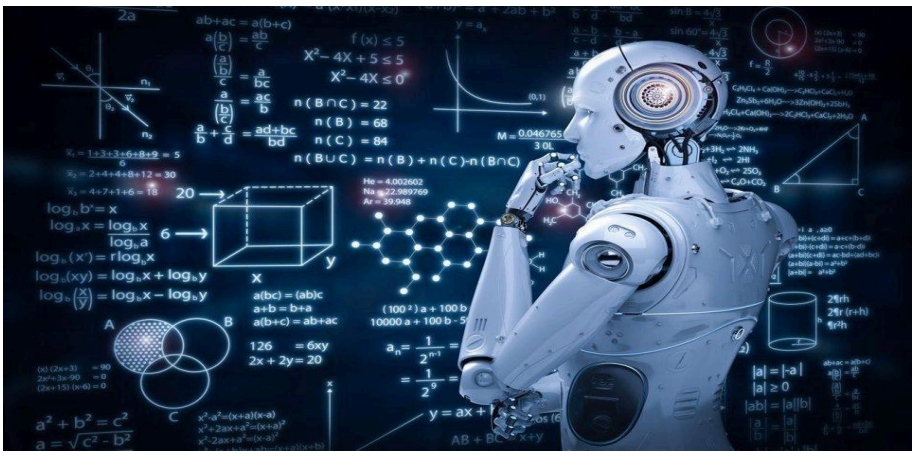
1.2 Key Terms

Foundational Concepts

Generative AI : A branch of AI devoted to creating new content/text, images, audio, code by learning patterns from large datasets instead of simply classifying data.

Artificial Intelligence (AI) : The broad discipline encompassing systems that simulate human-like intelligence—understanding language, recognizing patterns, solving problems—often through machine and deep learning.

Machine Learning (ML) & Deep Learning (DL) : ML involves algorithms that learn from data; DL is a subset using multi-layered neural networks, forming the backbone of contemporary generative models .



Core Model Architectures

Artificial Neural Network (ANN) : A layered network of interconnected artificial neurons that learns representations from input data.

Transformer : A revolutionary architecture introduced in 2017, using self attention mechanisms to process scenes in parallel, enabling efficient modeling of language, images, audio and more.

Large Language Model (LLM) : A transformer based model trained on huge text datasets, capable of generating logical and contextually rich natural language. Examples include GPT-4, Claude, and LlaMA.

Foundation Model : A wide trained AI model that can be fine tuned for many downstream applications; LLMs, vision, and multimodal models all fall under this category.

Specialized Generative Architectures

Generative Adversarial Network (GAN) : Consists of a generator and discriminator engaged in adversarial training; central for producing high loyalty images and other data .

Variational Autoencoder (VAE) : Encodes input data into a latent space and converts new samples; useful for controlled content combinations.

Diffusion Model : Trained to denoise (removing noise from images) inputs gradually; excels at generating state of the art image and audio content.

Multimodal & Agentic Model

Multimodal AI : Models that can ingest and generate multiple data types (text, images, audio, video) enabling flexible, real world interactions.

AI Agent : Autonomous systems that perform tasks, make decisions, and interact with tools (sometimes orchestrated in coordinated multi agent systems.) .

Additional Technical Terms

Fine Tuning : Adapting a foundation model to a specific domain via targeted training.

Inference : The phase when a trained model generates output in response to input.

Hallucination : When models generate plausible yet incorrect information.

Embodied AI : AI integrated into physical forms (robots, drones) that sense and act in the real world.

2. Recent Technical Developments

2.1 Model Launches & Updates

Major Model Releases :

Anthropic's Claude 4 (Opus & Sonnet) : Released in May 2025, the Claude 4 family brought significant improvements in thinking and coding tasks. It quickly gained praise for its stronger document comprehension and deep code generation capabilities .

DeepSeek R1 Refresh & V3 : In May, DeepSeek updated its R1 model, followed by DeepSeek-V3. This open source model now leads the Chatbot Arena leaderboard, exeptional contestant like LLaMA 4 and Qwen 3.

xAI's Grok 3 : Launched on February 17, 2025 (with improvements in July), Grok 3 introduces strong thinking tools such as "Think" and "Big Brain" modes, and excels in mathematical and scientific benchmarks.

Google Gemma 3n : On June 26, 2025, Google revealed Gemma 3n, a compact multimodal model created for on device use. It handles text, audio, images, and video inputs, supports 140+ languages on just 2 GB RAM, and is available via Hugging Face and Google AI Studio.

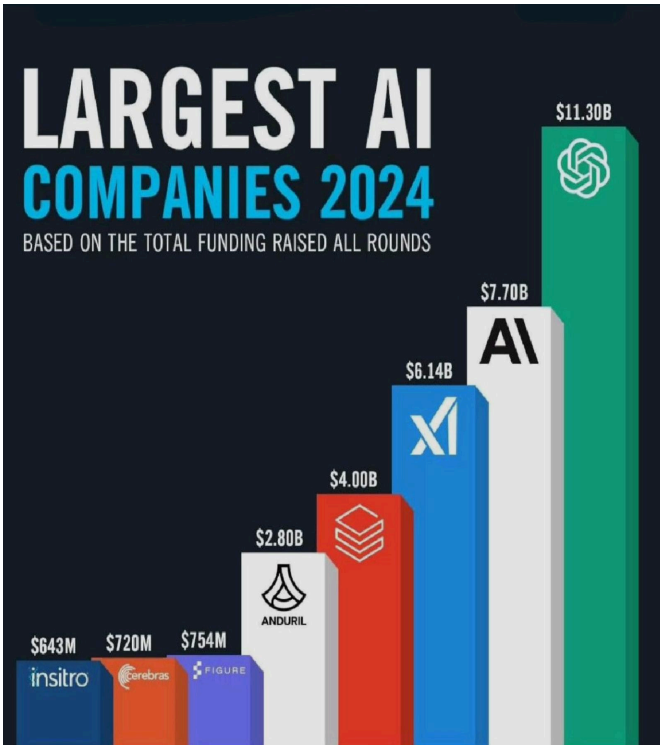
Google's Veo 3 & Flow : Released in May 2025, Veo 3 is Google's first text to video model that also generates synchronized audio. Paired with Flow (a video creation app) these tools mark a jump over in unified content generation.

IN SUMMARY :

Model	Specialty
Claude 4	Advanced reasoning & coding
DeepSeek-V3	Open-source high-performance
Grok 3	Mathematical/scientific reasoning
Gemma 3n	Compact multimodal mobile
Kimi 2	Open-source tool-calling
Veo 3 + Flow	Video + audio generation

2.2 Infrastructure & Investment Surge

The generative AI boom has spurred an unparalleled wave of investment not just in models but in the underlying compute, energy, and data center ecosystems essential to their function.



Mega-Scale Infrastructure Commitments:

US AI Hub in Pennsylvania : In mid-July 2025, major announcements revealed a collective investment of $90–$100 billion to build AI centric data centers and supporting power infrastructure in Pennsylvania. Google and Blackstone each promised $25 billion; CoreWeave contributed $6 billion, and AWS and other firms added to the total amplifying AI's transformative potential.

Google's $25B Hydrogen-Energy Deal : Google's investment includes $3 billion toward hydropower upgrades that promise 670 MW of clean energy for its AI facilities; an effort designed to ensure stable, carbon free power delivery.

Meta's Supercluster Push : After the LLaMA 4 delay, Meta promised hundreds of billions to build AI "superclusters" (a cluster of galaxies), even resorting to tent based data centers as temporary setups until permanent sites are ready.

Global Cloud & AI Infrastructure Expansion:

Hyperscaler Spending : Gartner projects global IT spend rising 7.9% in 2025, driven by a 42% surge in AI-focused data center systems. Meanwhile, hyperscalers like Google, AWS, and Microsoft are investing $75B, $100B, and $80B respectively in AI infrastructure this year .

State-Level AI Initiatives : The EU revealed "InvestAI," mobilizing €200B in AI infrastructure by 2030. Similarly, Europe's NVIDIA backed deployments aim to add over 3,000 exaflops (One quintillion floating point operations per second) of native compute power.

Oracle + NVIDIA LMTP Offering : In June 2025, Oracle integrated liquid cooled GB200 NVL72 clusters and DGX Cloud infrastructure to offer high performance AI factories to developers—hugely advancing enterprise capabilities.

Innovation in Infrastructure Software:

C-Gen.AI's GPU Orchestration Platform : This startup introduced a platform to optimize GPU resource utilization automating bunch of deployment, dynamic scaling, and unemployed capacity repurposing, significantly reducing costs.

Nebius AI Cloud Enhancements : Nebius deployed NVIDIA GB200 NVL72 and HGX B200 clusters, improving reliability with auto healing and topology aware scheduling, ushering elite performance for AI workloads.

Cerebras Supercomputer Rollout : Cerebras unveiled six new data centers globally and surpassed NVIDIA in inference speed.

IN SUMMARY

Dimension	Development
Scale	$90–100B invested in U.S. alone; global hyperscaler spending tops $255B.
Compute Power	Europe adding 3,000 exaflops; specialized clusters live globally.
Energy & Sustainability	AI hubs paired with energy upgrades like hydropower and nuclear-restarts.
Software Innovation	Turning GPU farms into efficient, AI-powered superclusters.

2.3 Emerging Public & Enterprise Platforms

Feature	Platform Examples	Notes
Conversational Search	Google AI Mode	Gemini 2.5-powered, multimodal, follow-up capable
Multimodal Tools	Gemini, Flow, Mariner, Astra	Allow personalized multimedia interactions
Enterprise RAG Agents	Contextual AI, RAG research	Prioritize security, context sensitivity
Cross-Cloud Dev-Tools	Replit on Azure + Google Cloud	Enables flexible deployment across clouds

3. Technical Trends & Capabilities

3.1 Multimodal AI & Embodied Systems

Multimodal AI has matured into embodied systems capable of sensing, thinking, and acting in the real world. From simulation grounded models at CVPR to real world agents like Helix and Gemini Robotics, AI is no longer content with passive understanding… It is becoming experiential, self governing, and physically grounded. This transformation opens new borders, not only in autonomy and efficiency, but also in safety, ethics, and human-AI harmony.

Feature	Description
Autonomous agents	VLAs now execute multi-step tasks, reducing need for prompts
Multi-agent collaboration	Discussions of modular, multi-agent embodied systems are gaining academic traction
Safety & ethics	Google DeepMind's ASIMOV benchmark aims to ensure safe embodied AI—crucial for physical deployment

3.2 Retrieval-Augmented Generation (RAG) & AI Agents

The Enduring Role of RAG:

Retrieval-Augmented Generation (RAG) remains a foundational technique in generative AI. In its classic form, an LLM gets back relevant external documents such as PDFs or database records, then blends that fresh context with its internal knowledge to generate accurate and grounded output. This significantly reduces hallucinations and eliminates the need for frequent retraining while preserving transparency: the model can cite the sources it used.

RAG's Evolution in 2025:

RAG has now matured into dynamic, agentic variants, rather than static pipelines:

-*Dynamic RAG:* The system adapts retrieval in real time during generation, choosing when and what to get based on developing model needs.

-*Parametric RAG:* The mixing of retrieved data happens at the parameter level, not only via prompting, enhancing speed and efficiency .

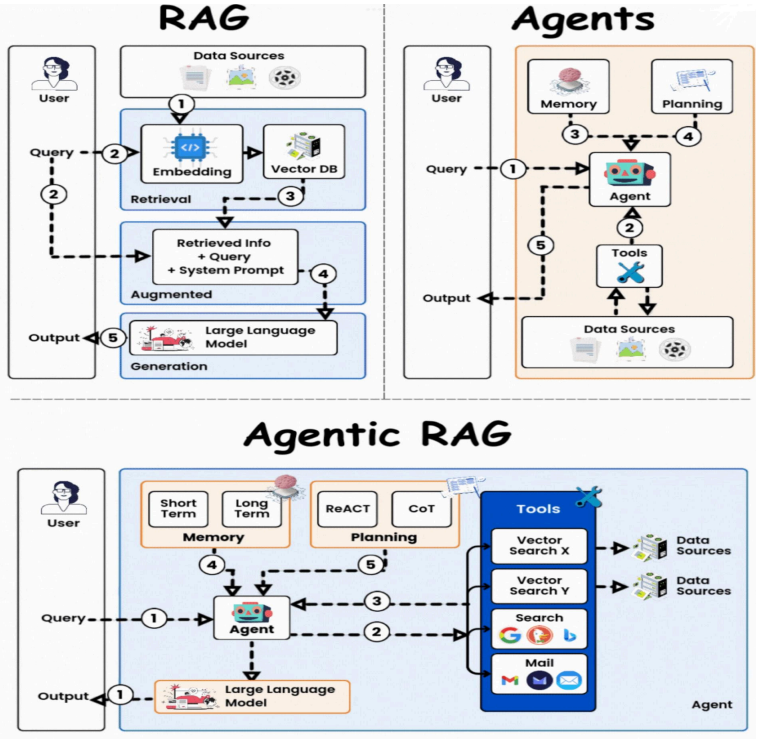
-*Agentic RAG:* Multiple specialized agents collaborate (such as planners, extractors, and Q&A agents) to solve complex, multi thinking tasks. For example, MA-RAG uses a multi agent chain of thought design to improve interpretability and modularity.

AI Agents: From RAG to Autonomy:

AI agents build upon RAG by combining thinking, operation, and tool use into self governing workflows:

- Companies are increasingly shifting from simple RAG systems to agent based architectures, which question live data at runtime instead of mass taking it into vulnerable vector databases.

-Agentic AI (driven by multiple collaborators) is being commended for its scalability, resilience, and adaptability.



These systems can be incrementally enhanced, tolerate partial failures, and comply with evolving regulations.

-Agentic RAG enables secure, undertaking grade automation: workflows in healthcare, finance, and customer service use agents to retrieve, analyze, reason, and act without compromising data privacy.

WHY IT MATTERS

Trend	Impact & Opportunity
Modular Autonomy	Agents specialized in function—like planning, retrieval, reasoning—drive robust workflows.
Security & Compliance	Runtime access preserves data controls, avoids stale or insecure central stores.
Efficiency & Scalability	Dynamic RAG and parametric approaches reduce latency and enable lightweight deployments.
Interpretability	Multi-agent chains can explain intermediate reasoning, increasing trust in outputs.

3.3 Explainability and Environmental Footprint

Explainability in AI:

Explainability (or interpretability) refers to the area to which the internal mechanics of an AI model, especially complex ones like deep neural networks, can be understood by humans.

Why it matters:

Without explainability, AI systems become "black boxes," making it difficult to understand why a decision was made. This is crucial in sensitive areas like:

- Healthcare (diagnosis predictions),
- Finance (credit approvals)
- Law enforcement (facial recognition, predictive policing).

Challenges:

- Deep learning models often trade interpretability for accuracy.
- As models like GPT or Claude become larger and more complicated, their decision making paths become harder to track down.

Current solutions:

- SHAP (Shapley Additive Explanations) and LIME (Local Interpretable Model-Agnostic Explanations): Widely used tools for model transparency.
- Attention visualization in transformers shows which parts of the input the model focused on.

- Model cards and data sheets for datasets: Introduced by Google and MIT to document model behavior, training data, and ethical concerns.

Environmental Footprint of Generative AI:

Training and running large models come with massive energy costs, which raise sustainability concerns:

Energy usage:

- Training GPT-3, for example, used a considered 1,287 MWh of electricity, equal to a small town's monthly usage.
- Carbon emissions from training large models can be more than 300 metric tons of CO_2, depending on location and data center organization.

Water usage:

- Cooling AI data centers consumes huge amounts of water.
- Google's Gemini 1 training reportedly used over 5 million liters of water.

Explainability in AI

Aspect	Details
Definition	The extent to which the internal workings of an AI model can be understood by humans.
Why It Matters	Lack of explainability turns AI into "black boxes," which is problematic in critical domains such as: HealthcareFinanceLaw enforcement
Challenges	Trade-off between interpretability and accuracy in deep learningLarge models (e.g., GPT, Claude) have complex decision paths
Current Solutions	**SHAP & LIME**: Tools to explain model predictions**Attention visualization**: Highlights model focus areas**Model cards & data sheets**: Document training data, behavior, ethics

Environmental Footprint of Generative AI

Category	Details
Energy Usage	Training GPT-3 used ~1,287 MWh — equivalent to a small town's monthly usageCO_2 emissions can exceed 300 metric tons
Water Usage	Cooling data centers uses significant water resourcesGoogle Gemini 1 training consumed over 5 million liters of water
Sustainability Concerns	High resource consumption during training and operation raises ethical and environmental concerns

4. Industry Applications & Use Cases

4.1 Enterprise Productivity & Coding Automation

Boosting Enterprise Productivity:

Generative AI is transforming how businesses work, particularly by automating routine tasks, speeding up workflows, and increasing decision making.

- Virtual assistants & co-pilots: Tools like Microsoft 365 Copilot and Google Workspace AI now summarize meetings, draft emails, and convert data entry.
- Internal search & knowledge retrieval: AI powered undertaking search systems (Glean, Coveo) help employees access relevant documents and institutional knowledge faster.
- Custom internal chatbots: Companies like McKinsey and Accenture use LLM based chat interfaces to convert customer support and internal doubts.

These tools reduce the time spent on containing tasks and allow professionals to focus on higher value work.

Coding Automation:

AI is also quickly changing software development:

- **Code generation & auto-completion:** GitHub Copilot, Amazon CodeWhisperer, and Replit Ghostwriter help developers by suggesting code pieces, detecting bugs, and translating natural language into functional code.
- **Low-code/no-code platforms:** Tools like Bubble, Zapier, and Pipedream allow non-developers to create apps or automate workflows with simple instructions.
- **AI for code review & testing:** Tools like CodiumAI and Codeium automate test generation, detect vulnerabilities, and suggest improvements, speeding up the development lifecycle while improving code quality.

Enterprise Productivity

Focus Area	Description	Examples/Tools
Virtual Assistants & Co-pilots	Automate routine tasks like summarizing meetings, drafting emails, and data entry	Microsoft 365 Copilot, Google Workspace AI
Internal Search & Knowledge Retrieval	Speeds up access to documents and company knowledge	Glean, Coveo
Custom Internal Chatbots	Answer internal questions and customer support queries using LLMs	McKinsey's & Accenture's internal chatbot systems

4.2 Media, Marketing & Content Creation

AI in Content Generation

- *Text & image generation:* Tools like ChatGPT, Jasper, DALL·E, and Midjourney are used for creating marketing copy, blog posts, advertisements, and product images. Companies like Canva now offer unified AI design tools for automated content creation.
- *Video & audio:* AI is now generating realistic background music and even scripted video content. Tools like Runway, and Sora by OpenAI allow users to generate high quality videos from text prompts.

Marketing Automation

- *Personalized campaigns:* AI systems can now analyze customer behavior and automatically generate personalized social media posts and product recommendations. Tools like HubSpot AI, Salesforce Einstein, and Persado deliver tested content that develops in real time based on audience engagement.
- Audience analysis: AI is used to detect views, trends, and demographic changes across platforms like TikTok, Instagram, and YouTube. This operates real time adaptation in creating strategies.

AI in Film Production

- *Script writing & storyboarding:* Studios and independent creators use tools like Sudowrite and ShortlyAI to write and visualize scenes.
- *Visual effects & post production:* AI speeds up VFX workflows at a part of traditional costs. (For example Marvel used AI for facial creating and digital reshoots.)
- *Deepfake & voice combination concerns:* While powerful, these tools also pose ethical concerns, especially in actor rights

4.3 Retail & Supply Chain (e.g., Amazon, Walmart)

AI in Retail Operations

- *Personalized Shopping Experiences:* AI models analyze browsing history and preferences behavior to generate custom product recommendations, pricing, and promotions. Amazon, Zalando, and Alibaba use fine tuned models to create personalized experience for every shopper.
- *Conversational Shopping Assistants:* Tools like Walmart's GenAI chatbot and Amazon Q help users find items, compare products, or track orders through normal language interaction.
- *Synthetic Product Descriptions:* AI now automatically generates product descriptions, FAQs, and reviews at scale using tools like Copy.ai and GPT powered internal tools.

AI in Supply Chain & Inventory Management

- *Demand Forecasting & Restocking:* LLMs, combined with predictive analytics, help retailers predict customer requests and automate stock restoration with high accuracy. Walmart uses AI to predict required shifts caused by events like weather, holidays, or trending products.
- *Product Design & Merchandising:* AI is even being used to design new products based on customer feedback and market gaps, particularly in fast fashion and home goods.

Ethical Aspect

5. Accountability for Misinformation Generated by AI

5.1 The responsibility for inaccurate or wrong information produced by AI

Developer Responsibility

- AI models such as ChatGPT - Deepseek are responsible for the databases ,filtering systems and security protocols and they should take ethical security measures to prevent the production of wrong information; however, beyond ethical concerns, the question of legal responsibility also arises.

- The principle of Strict Liability holds that ‘Whoever develops the product should be directly held’ According to this view, a faulty model is a “product,” and the developer is responsible for product defects; however when we consider AI models as a tool, does product liability apply to these models? Currently, courts seem to be moving closer to considering AI models as a tool, but there is no clear application at this point.

User Responsibility

- Artificial intelligence systems respond to questions or generate content based on prompts given by users.In this manufacturing process the user does the following:

  -Determines the subject

  -Directs the format

  - Decides on the obtaining, sharing, and use of content.

  Therefore, If the user makes a mistake in one of these three things, AI may provide or generate incorrect or misleading information. In this case, the responsibility for the mistake and acting accordingly belongs to the user and additionally If AI tools do not guarantee the information that has been generated by their own tool ,sharing responsibility is the most accurate approach.

- The Phases for which users are responsible

  -Prompt Design : Knowingly writing misleading, deceptive, or manipulative request

- Result Verification : Accepting AI output as correct without verifying it with other sources

- Sharing/ Distributing : Sharing incorrect information with others on platforms such as social media

- Wrong Usage : Presenting AI output as if it were expert opinion or information recognized as accurate by the country in areas such as education, law, and health, which are among the most important areas in the country.

Platform Responsibility

- People publish output or information that is obtained from AI on various platforms, such as Youtube and Instagram to enable others to access it. These platforms are active distribution tools , do not only provide users with information obtained by AI they also:

  - Share and access systems to facilitate distribution

  - Guides the content

- Platforms must be able to detect and filter out any harmful, misleading, or dangerous content that is generated by artificial intelligence. This includes false medical advice, hate speech, and deepfake content. Automated moderation systems are under scrutiny for over- and under-enforcement.

International Legal Developments

- According to the European Union Digital Services platforms are responsible for removing harmful AI content and displaying warnings about age, sexuality, violence, etc. without being seen by users.However , according to many laws currently in force, no platform can be held directly responsible for such content

Source Transparency and Citation

- Source transparency is clearly showing which sources and data the information produced by artificial intelligence tools is based on. Citation is the presentation of all these data to the user with complete transparency.

Why It Matters

It becomes very difficult to verify the accuracy of content for which no sources are given and plagiarism , which has caused a lot of problems in recent years, means that if an AI submits a piece of writing that it has taken from someone else or another AI tool to the user without acknowledging the source, this constitutes plagiarism. Last but not least, AI-supported content used in academic fields must be supported by strong references; otherwise, there will be a significant decline in the quality of the content and confidence in it.

HITL SYSTEMS (Human In The Loop Systems)

- HITL systems are artificial intelligence outputs that are checked by a human before reaching the user, thus preventing the artificial intelligence from producing incorrect or misleading results.

The Main Goals Of HITL Systems

-Ensuring that unethical content is removed or that proper sanctions are imposed.
-Ensuring the accuracy of information released about critical areas such as education and health.
-Enhancing the trust of the user by detecting the faults before it will be published.

6. Economic, Legal & Social Impacts

6.1 Market & investment dynamics (ad-supported AI, ad budgets shifting)

Ad-Supported AI as a Business Model

- Platforms like Google's AI Mode and Meta's LlaMA based tools increasingly combine ads into user experiences, like social media feeds.
- This raises concerns over algorithmic bias, user manipulation, and the ethics of engagement in knowledge generation environments.
- Critics argue that these models may prioritize engagement and virality over accuracy or safety, potentially strengthen misinformation.

Shifting Advertising Budgets Toward AI Content

- Marketers are now reallocating major parts of their budgets toward AI-generated media:

  -Automated ad copy, AI-generated product photos, and AI video commercials are now general.

  -Instead of traditional creative teams, agencies are subscribing to platforms like Jasper, Canva Pro AI, and Adobe Firefly to scale content at lower cost.

- This throws the traditional creative industries in confusion, potentially underrate human creative labor and shifting value toward platforms, not artists.

Rise in AI Investment

Since late 2023, there has been a sharp slight upward trend in global investment in generative AI:

-Major players like Microsoft, OpenAI and Amazon have led the way with billions in infrastructure and cloud calculating.

The hype surrounding GenAI has turned it into a new risky border, similar to crypto in 2021, raising concerns over sustainability, ethics, and monopolization.

6.2 Workforce Transformation & Job Displacement Concerns

Automation of White-Collar Tasks

Generative AI is no longer limited to factory automation or back end operations, it's now replacing or reshaping creative jobs:

- Tools like ChatGPT, Copilot, and Midjourney automate content writing, coding, design, and even legal or financial drafts.
- A 2025 IBM report predicts that over 40% of workforce tasks globally could be done by GenAI in the next 3 years.
- Entry level positions like junior marketers, copywriters, paralegals are especially in danger, as AI delivers faster and cheaper products.

The Rise of "Centaur" Professions

Rather than full automation, many companies now encourage AI-human collaboration models:

- Employees are trained to use GenAI as a copilot, increasing organization while maintaining human mistakes.
- New roles are coming out, such as:

-Prompt engineers

-AI content editors

-Synthetic media supervisors

-Ethical AI compliance officers

This transformation shifts the nature of work: workers who adapt to AI become more valuable; those who don't risk displacement.

Ethical Concerns Around Labor & Exploitation

- The datasets controlling GenAI are often raked from unpaid labor (blog posts, forums, art, and journalism) all done by real humans.
- Platforms may replace the very creators whose work trained the models, with no compensation, raising debates around digital labor theft.
- Workers in the Global South are still used for data branding and moderation, often underpaid and hidden from AI's experted outer.

Job Creation? Or Just Job Replacement?

- While some argue AI creates new economic opportunities, many of these jobs are:

  -Highly specialized, requiring upskilling.

  -Short-term, tied to startup cycles or hype waves.

- Economists warn that the step of AI adoption may go faster than the rate of reskilling, especially in regions with limited access to training.

6.3 Trust, Ethics & Regulation (consumer perceptions, AI Acts, and the future of policy)

Consumer Trust in Generative AI

Public attitudes toward AI have shifted dramatically since 2023:

- Trust is conditional, users appreciate AI's usefulness but remain skeptical of its intentions.
- Surveys from 2024–2025 show rising concerns over data privacy, bias, and lack of transparency in how AI makes decisions.
- The "black box problem" (AI decisions being unexplainable) continues to wear away consumer confidence.

The Regulatory Landscape: From Guidelines to Governance

Governments are moving from soft guidance to binding laws:

- The EU AI Act (passed in 2024) classifies AI systems by risk level, banning some use-cases entirely while mandating clarity for others.
- In the US, executive orders and proposals focus on fairness, algorithmic accountability, and safety standards, but progress is snatched.
- China's Generative AI Measures (July 2023) already enforce strict pre-approval and content moderation for models trained on public data.

International organizations like OECD, UNESCO, and the G7 Hiroshima Process are also shaping global norms for ethical AI.

Ethical “By Design”: The Role of Developers

There's a growing debate about who defines the “human values” and whether private companies should self-regulate.

Corporate Ethics vs. Public Interest

- Major tech firms now have AI ethics boards, but critics argue many of them are symbolic.
- Whistleblower cases like Google’s dismissal of Timnit Gebru have shown the conflict between research unity and business goals.
- Startups sometimes prioritize speed over safety, especially under pressure to secure funding and market share.

7. Expanding Ethical Dilemmas in AI

7.1 Plagiarism& the ethics of AI generated academic work

Definition Plagiarism In The Context of AI

Plagiarism is the use of another person's content, ideas, or work without citing the source. Today, with the continuous development of artificial intelligence, people are reproducing information obtained from artificial intelligence tools' training data or acquired knowledge without citing the source.

Impact On Academic Work

Academic integrity protects the reliability of knowledge and society's trust in the scientific community. Uncontrolled and overuse of AI could seriously damage this trust. And if this trust is damaged, social misinformation increases, people begin to question professors and diplomas, employers can no longer trust diplomas as much as they used to, and everyone starts to wonder, “Did this person really graduate fairly, or did they graduate with AI?”

In Turkey and other countries that have adopted exam-based education systems, the system focuses on students' homework and exams rather than their educational process, and graduation depends on these factors. Therefore, the system forces students to use artificial intelligence, and it is quite difficult to reduce usage rates unless the system changes.

Current Solutions

1- Faculty members holding ethical discussions with students about the use of AI in academic work .Thus ,they could enhance the consciousness about the usage of AI

2- Evaluation methods should focus not only on the text output, but also on the student's production and learning process.

3- Funding for academic projects should be conditional on the requirement to provide transparent reports on AI usage.
(Indian Institute of Technology Delhi has published guidelines requiring the explicit declaration of content generated, supported, or influenced by AI in order to protect academic integrity.)

4 - The addition of AI-generated text detection modules to existing systems such as Turnitin and iThenticate.

7.2 The ethical implications of AI replicating human voice, facial features, or writing style

Consent and Privacy Violations

Artificial intelligence can mimic voices, faces, and writing as if they came from a real person, leading people to believe fake content more easily. In addition to this, it also undermines freedom of expression and media reliability.

A person’s face, writing style and voice are part of private life and unauthorized use of these factors is a violation of both privacy and personal data protection laws. The potential of these signals mislead people or generate false content could cause serious confusion and have serious consequences in crucial areas.

Recommended Solutions To Prevent Privacy Violations

1- Since most legal regulations do not cover AI-generated content, personal data protection laws need to be revised to include AI content.

2- Prohibition of replication of faces, voices, or writing styles without prior approved explicit consent.

3- Creating online panels where users can withdraw their consent with a single click

Deepfake Risks

Deepfake changes images and sounds with the help of artificial intelligence to make it look like a person did something they didn't do in real life. While this technology is used in sectors such as entertainment, it also carries risks such as reputation assassination, scam , and political manipulation.

In 2020, the CEO of an energy company in the UK got a call from someone he thought was a manager at the main company in Germany.The caller had even mimicked the manager's voice, tone, and accent using deepfake technology on the phone, he was told that an urgent purchase payment had to be made, and approximately €220,000 ($250,000) was sent from the company account to a fake Hungarian supplier. And this fraud proves that people are not only using deepfake on media they could also use for financial fraud.

7.3 Use of AI in assignments and projects & the potential for increasing human laziness

Use of AI In Education

Artificial intelligence plays a significant role in education today, but is its use by students a facilitator and a useful tool, or does it become an obstacle to learning? Although people have concerns about using AI in education ıt also offers several advantages.

The Advantages Of Using AI In Education

1- AI can help students understand topics more quickly by simplifying complex subjects or offering different ways of explaining them.

2- Artificial intelligence can detect a student's weaknesses and provide a learning process accordingly.

3- Brainstorming processes can broaden students' viewpoints.

These advantages are clearly showing that using AI in education is not harmful when it is used to support the learning process rather than quickly moving through it. But unfortunately a survey conducted by Intelligent.com in 2023 revealed that 30% of university students regularly use artificial intelligence tools to complete their assignments, and more than 50% believe they learn less from these assignments. This survey shows that a significant portion of today's students see artificial intelligence not as a helpful tool to learn and add something to themselves , but as a means to quickly get through the learning process.Although banning the use of AI is one solution, changing students' perspective on this issue would be the most beneficial and comprehensive solution.

Fairness and Evaluation Integrity

One of the fundamental principles of education is that students should be evaluated fairly by teachers or professors.Student’s academic success and job offers they will receive when they graduate are directly dependent on that evaluation progress. Today ,all students are studying under different conditions that cause some students to not access AI and that may lead to unfairness among the students and ıf unfairness arises that will harm the trust of the education system .

Current Problems

1- Students can use answers generated entirely by AI in their homework or exams, which prevents teachers from accurately evaluating students' actual levels.

2- Access to technology is becoming more important than academic achievement

3- In universities and some schools, the use of artificial intelligence in exams and assignments is allowed in some areas but prohibited in others, and measures have been taken in this regard. However, plagiarism control programs are sometimes unable to detect artificial intelligence content.

Human Laziness In Education

Education is a process in which students not only learn, but also do a lot of cognitive development, such as thinking, questioning, researching, and generating ideas.However, even if AI tools provide students with short-term convenience at the touch of a button, in the long term this could have a negative impact on students' motivation to learn and their cognitive development. In a study conducted by MIT (Massachusetts Institute of Technology), students were divided into three groups: those who wrote using only their brains, those who used search engines, and those who used LLMs such as ChatGPT. EEG data revealed that brain activity was significantly reduced in the group that used AI. These students performed worse in terms of both creativity and learning retention. This study clearly shows that artificial intelligence contributes to education but also brings cognitive and motivational risks.

7.4 Emotional connection with AI (Can/should humans bond with artificial entities?)

Over history,people have developed emotional connections to technological devices.Emotional connection with AI could be beneficial and supportive for elderly ,those alone and those who need psychological support .Despite these advantages, it can lead to a weakening of people's social bonds and social skills and cause them to become isolated from real human interaction.

According to numerous research studies, people who have intense emotional bonds and conversations with artificial intelligence tools experience increased levels of loneliness and some mental health issues.

Researches Conducted On Emotional Connection With AI

1- According to joint research by OpenAI and MIT Media Lab, as users engage in intense emotional conversations with ChatGPT, their levels of loneliness increase and their face-to-face social interactions decrease.

2- A Common Sense Media report indicates that young people are showing great interest in AI chat applications and that this can weaken their social skills and distance them from real relationships.

3- The state of Illinois passed a law restricting the use of AI in mental health after some users placed excessive meaning on AI chatbots, resulting in psychological breakdowns and suicides.

Current Solutions

1-Seminars and training sessions organized to make people aware that artificial intelligence conversations mimic empathy.

2-Limiting the duration of conversations with artificial intelligence

7.5 Accessibility concerns (Is AI development and access limited to developed countries?)

We are living in the age of artificial intelligence, and artificial intelligence is bringing revolutionary innovations to many areas, from education to economics, health, and public services. However, if most of these innovations are concentrated in developed countries, developing countries could be left behind, and the situation in underdeveloped countries could worsen.

The risk in artificial intelligence access increases the existing digital divide between countries and may cause serious socio-economic class differences between developed and developing countries. If that accessibility will continue under the control of developed countries, information and technology will become monopolized, leading to the collapse of the competitive environment.

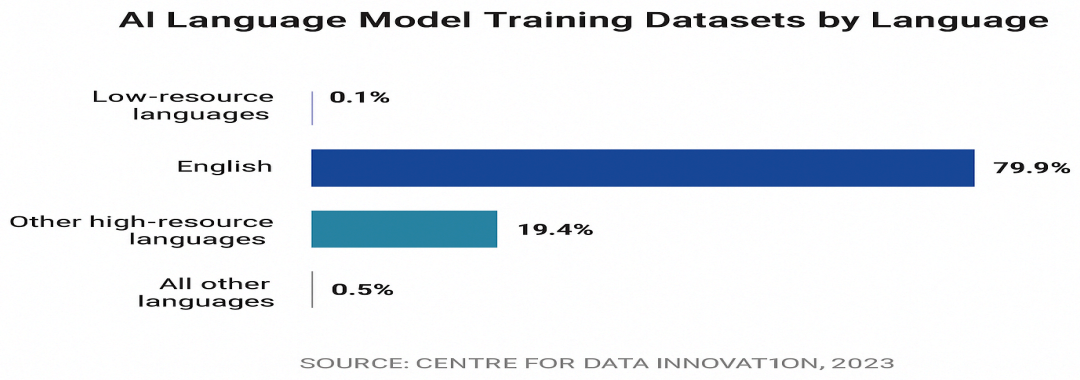
Differences In Investment Between Countries

According to the European Parliament's source: In 2023, the US will lead the way in private sector AI investment with $62.5 billion, followed by China with $7.5 billion, a difference of 8.5 times between them. Spain, in 15th place, will invest $0.4 billion.Such a large difference between countries' investments indicates that there will be much more economic disparity between countries in the future.

According to sources from the UNCTAD (United Nations Trade and Development) Organization, if artificial intelligence incomes continue to grow at this rate, we may be able to see that they will reach global GDP levels in the future, but due to access and investment problems, most of these incomes will go to developed countries.According to UNCTAD's 2025 report, despite the growing importance of AI more than two-thirds of developing countries do not have national AI strategies. Most of the 118 countries are unable to give artificial intelligence the attention it deserves due to economic capacity, infrastructure, and political priorities.

Linguistic And Cultural Deficiency

AI models currently provide services in languages that have a lot of resources available on the web, but a lack of resources for some languages creates problems. People in regions such as Africa receive insufficient services in their local languages, which means that these communities are unable to benefit sufficiently from artificial intelligence technologies.



8. Artist's Originality In The Age of AI

8.1 The potential harm of AI-generated art on human artists' originality and creativity

Artificial intelligence tools can produce images, music, and texts so quickly. Therefore, the value of the artworks that artists have put a lot of effort into creating is declinin.

In addition to its significant role in other fields, AI has entered the field of art production, threatening the values of originality, creativity, and individual expression that are at the heart of art.

Current Problems

1- Artificial intelligence art tools can produce new works by learning from existing works on the internet, and according to the AEIS study, it is emphasized that popular AI art tools such as Midjourney, Stable Diffusion are commonly trained using artworks without permission.

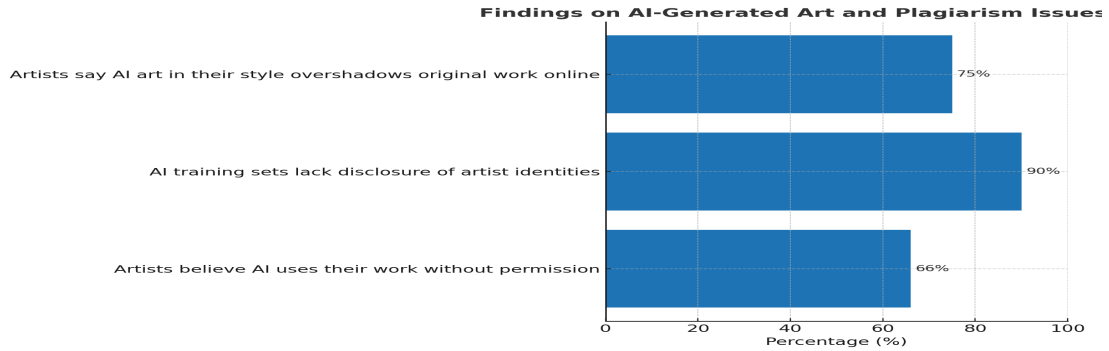
2- The increasing demand for faster service and the widespread use of AI are driving a shift in which artists are being replaced by AI.

3- AI works that mimic an artist's unique style devalue the artist's individual style. Some artists have reported that AI images produced in their own style receive more attention on social media than they do.

8.2 The connection between plagiarism and AI-produced art and design

There is a growing debate upon If AI produces artworks by mimicking the existing works that are already available on the internet and also artist's style, What is the difference between plagiarism and AI art tools? AI art generators such as Stable Diffusion, MidJourney scan and learn millions of works of art, often without permission from the artists. This process reduces society's trust in the art world. In addition, in a place where similar works can be produced in a matter of seconds, originality is seriously undermined.

According to research conducted by University of Chicago in 2023 more than 90% of AI artworks producers do not disclose which artists are included on their training databases and therefore artists can not ensure who used artworks without taking their permission also undermines artists' personal property rights.



Getty Images has filed a lawsuit against Stability AI in the US. A Getty watermark was found on a work produced by AI, which is strong evidence that the data was copied directly. Getty claims that the images were used without permission. The outcome of this lawsuit could bring about a number of breakthroughs in the field of plagiarism.

If we would like to set a transparent environment in the art field the AI artwork producer should disclose which artist's work they have used and, similarly to patents, artists' own styles must be protected by law from commercial exploitation.

8.3 Steps to protect and preserve authentic artistic expression in the AI era

There are elements in a work of art created by an artist, such as experience, emotion, and culture, that artificial intelligence tools can never replicate, and it is these elements that make the artist worthy.If artificial intelligence works continue to replace human works, the elements we have mentioned, i.e., the things that make art art, may be at risk of disappearing.

According to UNESCO's 2023 report more than 60% of artists have expressed concern that artificial intelligence could weaken cultural identity and authenticity in the long term.During this process, if artificial intelligence companies want to protect the cultural heritage, diversity, and experiences of society rather than opposing artists, they must stand by artists. For instance, Stability AI has launched a system that allows artists to flag their royalty - copyrighted works and request their removal from datasets;such implications benefit both AI art creators and artists.

The Steps Must be Taken

1- Governments and international institutions should require transparency and artist permission for data sets.

2- Platforms should offer artists the right to opt out of having their works included in educational sets or provide fair payment for their use.

3- As with Stability AI, artificial intelligence developers should collaborate with artists to organize their data sets and prevent artists from being victimized.

9. Manipulative Use of AI by Society

9.1 The ways people use AI manipulatively rather than for educational purposes

Artificial intelligence entered people's lives as a tool to provide personalized rapid learning and efficiency, but over time, students and even teachers sometimes used artificial intelligence tools in manipulative and unethical ways.According to research conducted by Forbes 43% of students acknowledged using artificial intelligence in ways that their schools would consider cheating or plagiarism.

Consequences of Manipulative Use

1- If the manipulative and unethical use of artificial intelligence by students becomes normalized, it will become difficult for teachers and institutions to evaluate students fairly.

2- If artificial intelligence is overused, students may experience a significant decline in their thinking, creativity, research, and production skills, which may prevent the creation of new ideas and technologies in the future.

3- Many universities have started using artificial intelligence detection software and have returned to handwritten exams, believing that artificial intelligence prevents teachers from evaluating students based on their actual achievements.

University Policy	Examples
Universities avoiding AI detection	Vanderbilt, Michigan State, Northwestern, UT Austin, Cambridge, Russell Group members
Universities completely disabling AI detection	MIT, Yale, Harvard, Stanford, NYU, UCLA, UBC, Simon Fraser University
Partial/limited use of AI detection	RMIT (educational purposes only)

Universities that have completely stopped using AI detection tools say they did so to prevent students from being victimized as a result of false detections by AI detection tools.

These universities such as MIT, Harvard and Stanford are taking different approaches to detect AI use by students: The student is tasked with explaining the assignment they have completed, and if it is a written assignment, they are to discuss it. In addition to that they want students to submit a process-oriented report and the resources they used throughout the assignment and lastly they expect students to voluntarily admit to using AI.

9.2 The potential consequences and risks of manipulative AI use by children

Children are the most vulnerable age group to technological manipulation because their critical thinking skills are not as developed as those of adults.If artificial intelligence is used to manipulate children, it could negatively affect their future habits, who they will become, and their contribution to society.According to UNICEF data from 2021, 75% of children online are exposed to algorithmic manipulation, such as hidden advertising and targeted recommendations, which appear without their request.

Current Problems

1-Children frequently share their personal data with AI systems without realizing it when they interact with them.These collected data are used for more targeted advertising.

2- The content provided by artificial intelligence programs in the entertainment and online gaming sectors can lead to excessive screen time and addiction in children,According to a 2022 study by Common Sense Media, children aged 8–12 spend an average of 5 hours a day on digital platforms, with AI-generated content accounting for a large portion of that time.

3- Because of targeted advertising, kids can unconsciously make in-app purchases.

10.Questions to be Examined

-How is AI impacting specific sectors?

-What are the major infrastructure and challenges as AI is developing ?

-Do AI systems reflect racial and class-based biases from where they are designed?

-To what extent is AI improving productivity without threatening jobs?

-What frameworks are appearing to govern AI ethically ?

-How can AI systems be made more aligned with public values?

-What are the social consequences of ad supported AI business models?

-How should regulation adapt to ensure fairness and protection of rights?

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