



AI, Foresight, and Science and Technology at GAO



Sterling Thomas, PhD

Chief Scientist
U.S. Government
Accountability Office

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AI at GAO

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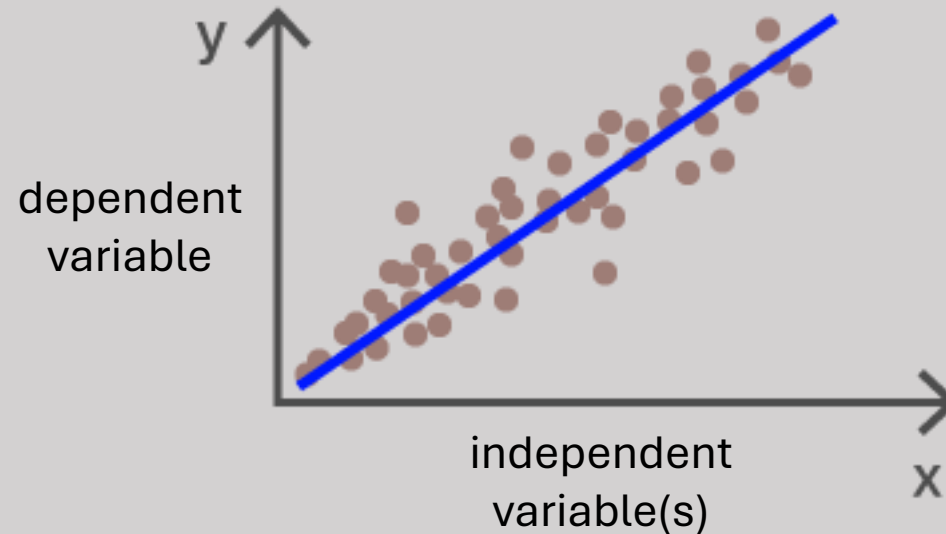
GAO



AI builds on decades of analytics

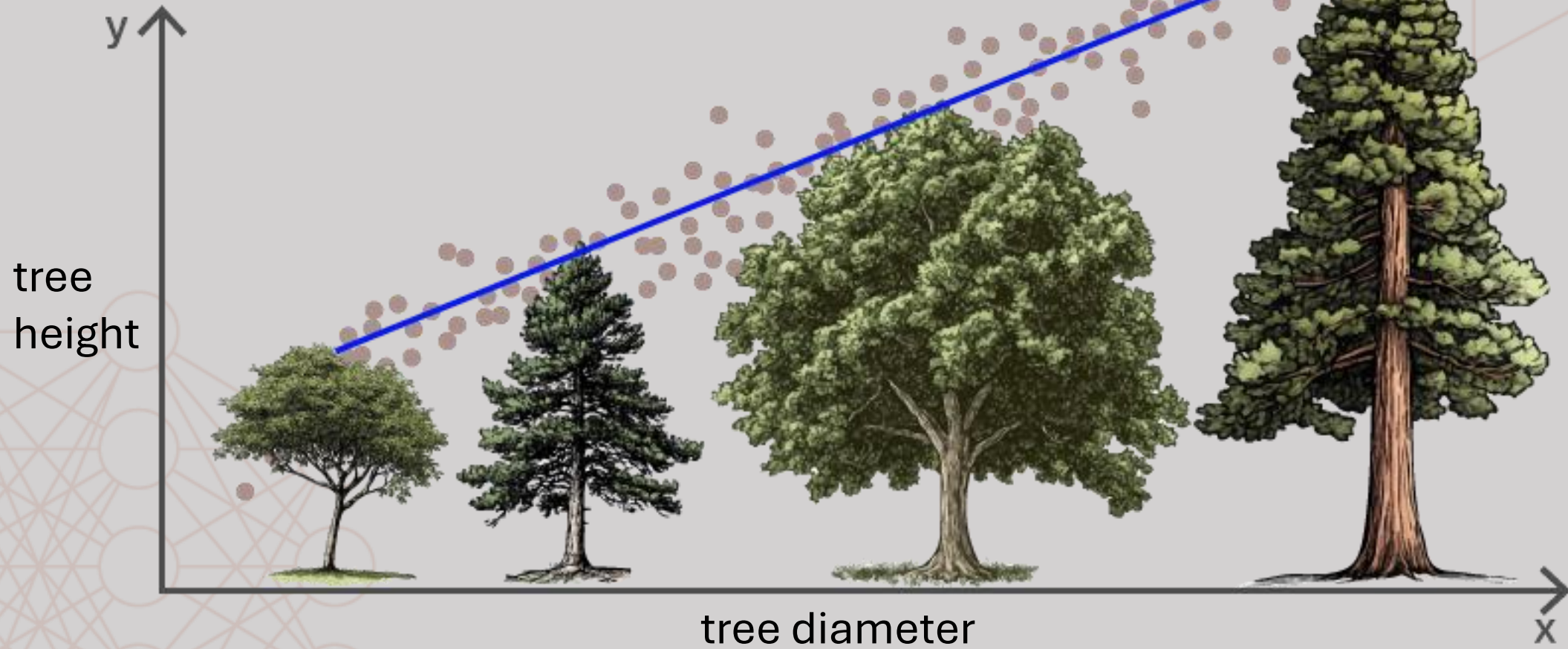
Starting with...

- **Simple regression:** describe a relationship between two variables by calculating the blue line

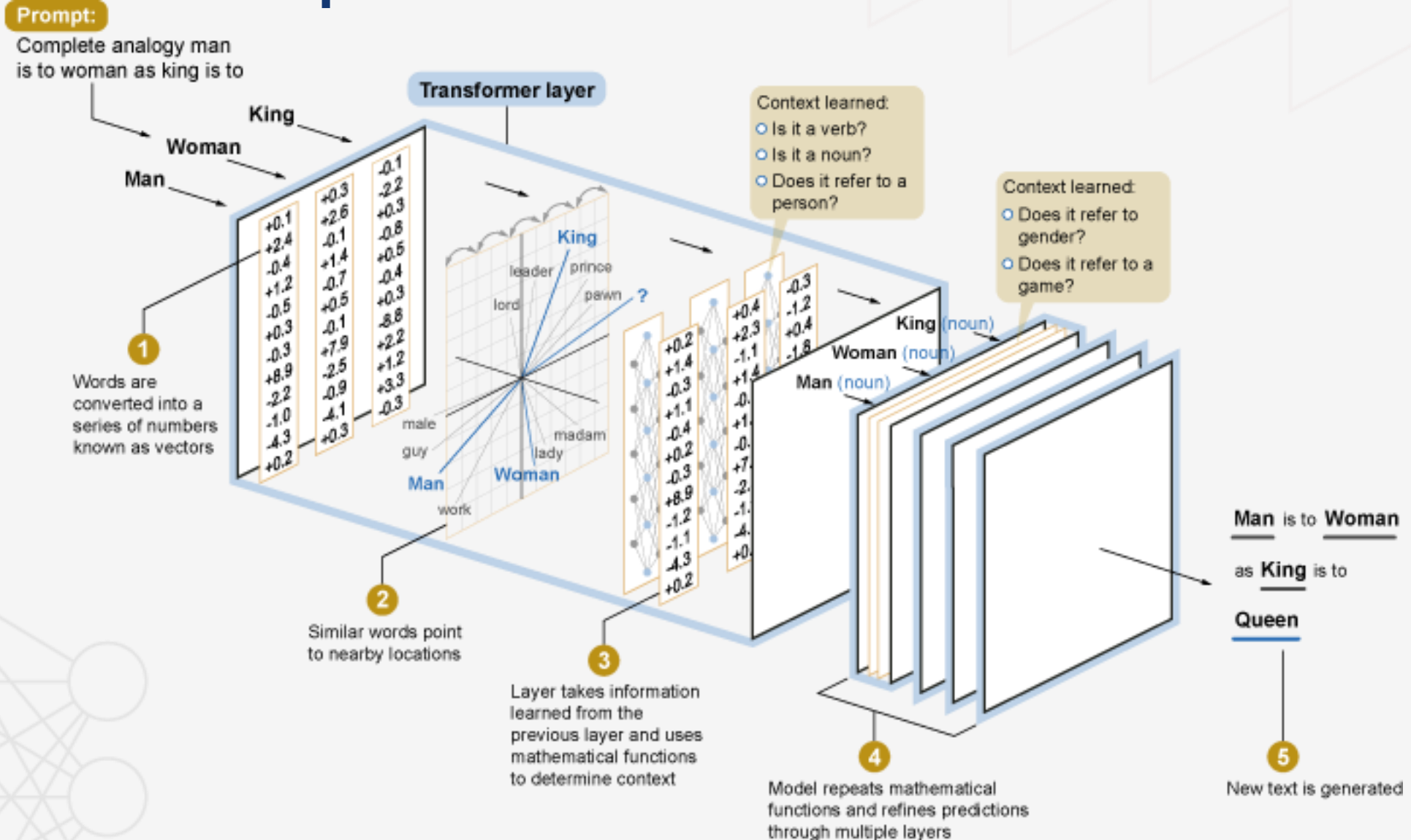


Example

- Tree diameter and height



Simple transformer architecture



Vector for the word “cat”

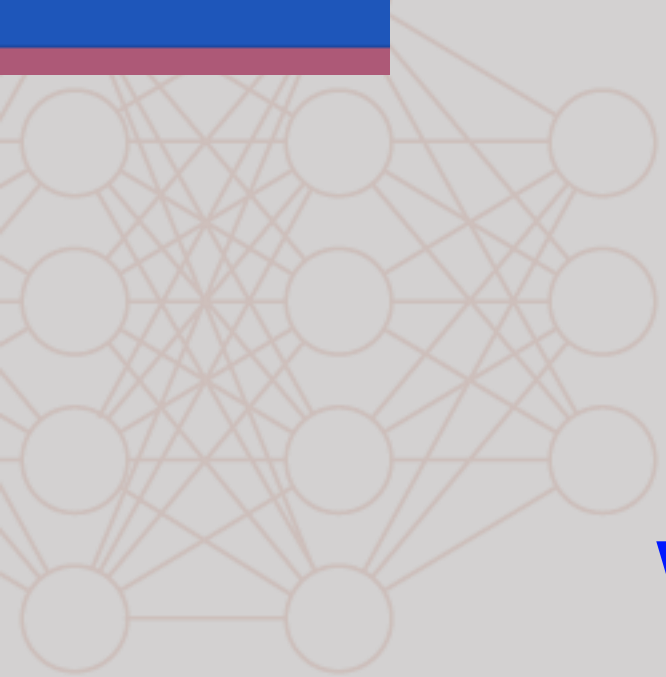
in a model called *MOD_enwiki_upos_skipgram_300_2_2021*

[0.026275847107172012, 0.010517630726099014, -0.03723245859146118, 0.2634263336658478, 0.27159205079078674, -0.004058598540723324, 0.09411223232746124, 0.03763202950358391, 0.0677901953458786, 0.013615828938782215, -0.16626013815402985, -0.07512251287698746, 0.03231512010097504, 0.01070499885827303, -0.1998470425605774, -0.1406830996274948, -0.35442763566970825, -0.2826053202152252, 0.20517906546592712, -0.061711959540843964, 0.0553741529583931, -0.07947561889886856, 0.36058270931243896, -0.18250514566898346, 0.09193558245897293, 0.25107425451278687, 0.0032481239177286625, -0.2228851467370987, 0.12824469804763794, 0.1804560273885727, -0.22922773659229279, -0.15449629724025726, -0.4489767253398895, -0.0011336790630593896, 0.15314607322216034, -0.5254043936729431, -0.06919074803590775, 0.07075195014476776, 0.04077175632119179, 0.10582190752029419, 0.21858002245426178, -0.16373135149478912, -0.18926094472408295, -0.057782456278800964, 0.13000017404556274, -0.254604309797287, 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A woman with a joyful expression is shown from the chest up, wearing a green sweater. She is holding a smartphone with an orange case. Overlaid on the bottom right of the image is a semi-transparent white interface for an AI application. It features a text input field with the placeholder text "Prompt..." and a star icon on the right. Below the input field is a button with a star icon and the word "Generate".

AI FEELS DIFFERENT

A decorative graphic in the top left corner consists of a grid of circles connected by lines, resembling a neural network or a data structure. The circles are arranged in a roughly circular pattern, with lines connecting them to form a mesh.

We interact with AI differently than we do with other tech.

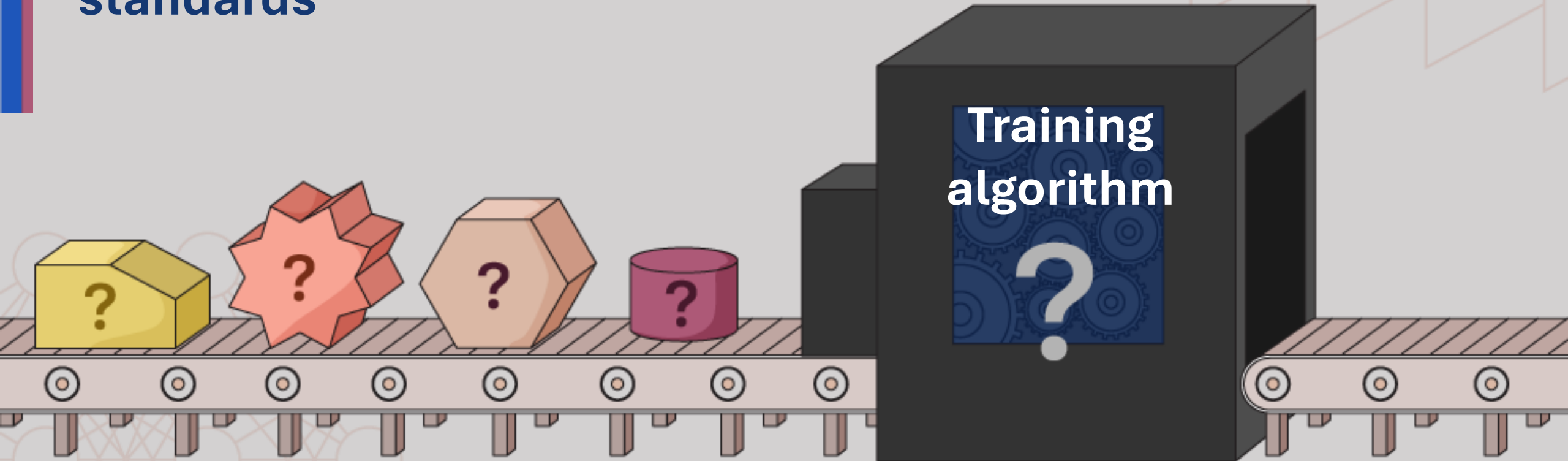
AI is only as good as the data we feed it.

What about...

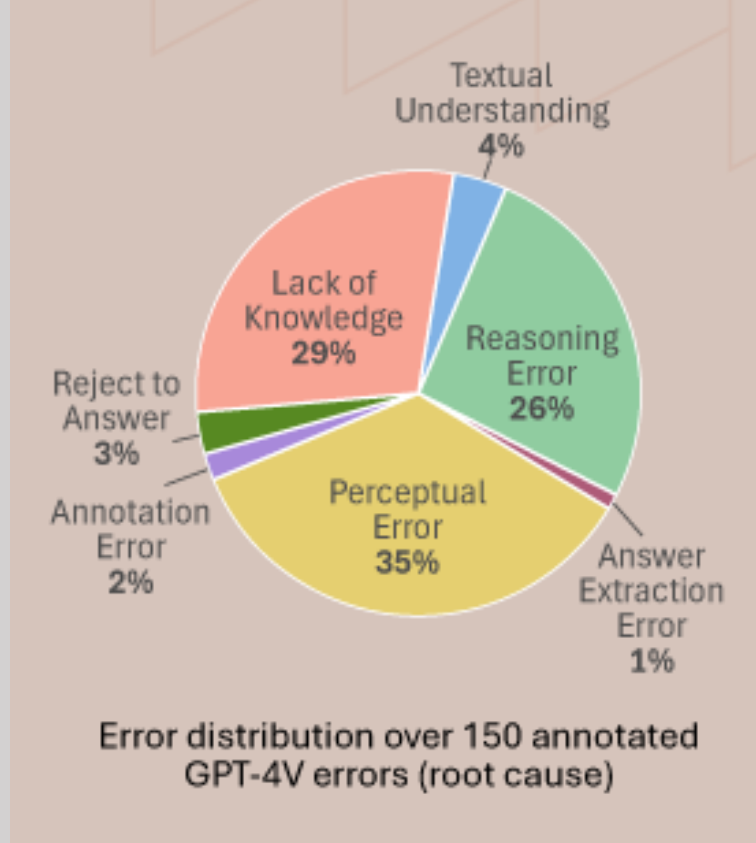
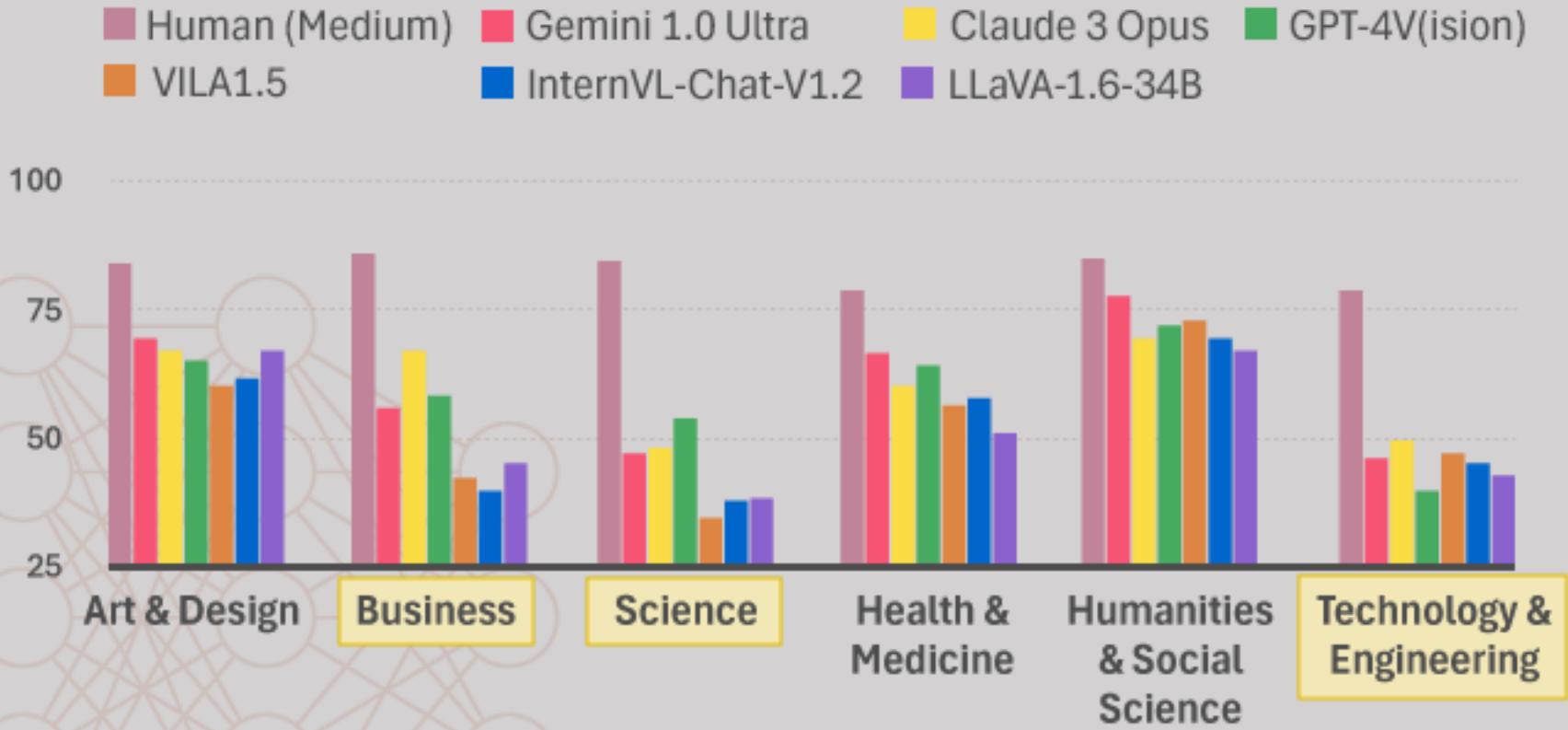
- data access issues?
- missing data?
- poorly maintained data?
- existing biases?



Government data varies in quality and standards



Subject-specific Accuracy



Source: Yue, X. et al. MMMU: A Massive Multi-discipline Multimodal Understanding and Reasoning Benchmark for Expert AGI; Proceedings of IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR): 2024, pp. 9556-9567





Foresight and Horizon Scanning at GAO

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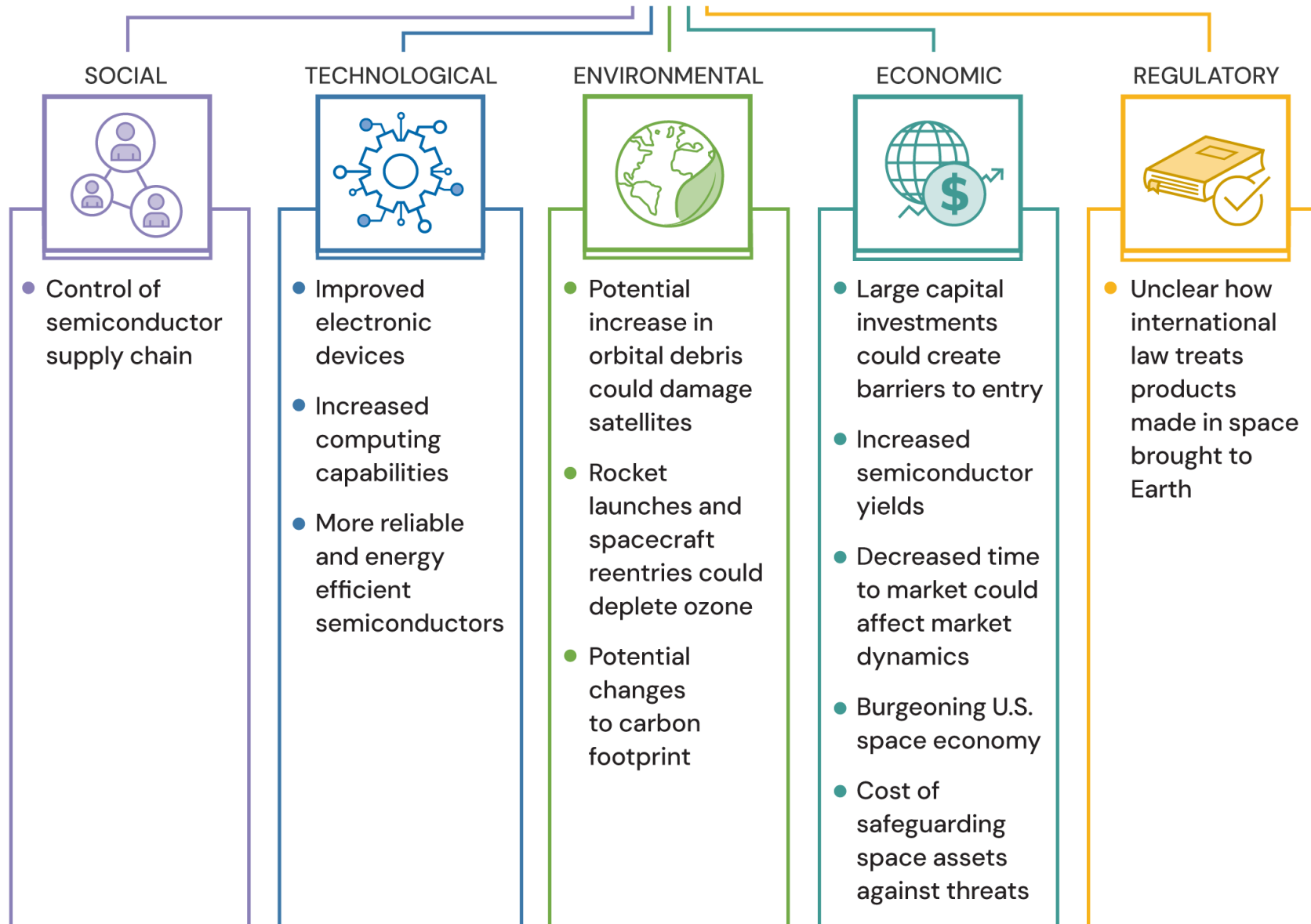


A central graphic with a light blue background. In the center is a stylized atom with a nucleus and three elliptical orbits. Overlaid on the atom are two white rectangular boxes containing the text 'EMERGING' and 'TRENDS' in a bold, blue, sans-serif font. Surrounding the atom are six hexagonal icons: a human silhouette, a satellite, a DNA double helix, a globe, a water bottle, and a laboratory flask with a leaf. The background of the graphic has a subtle grid pattern.

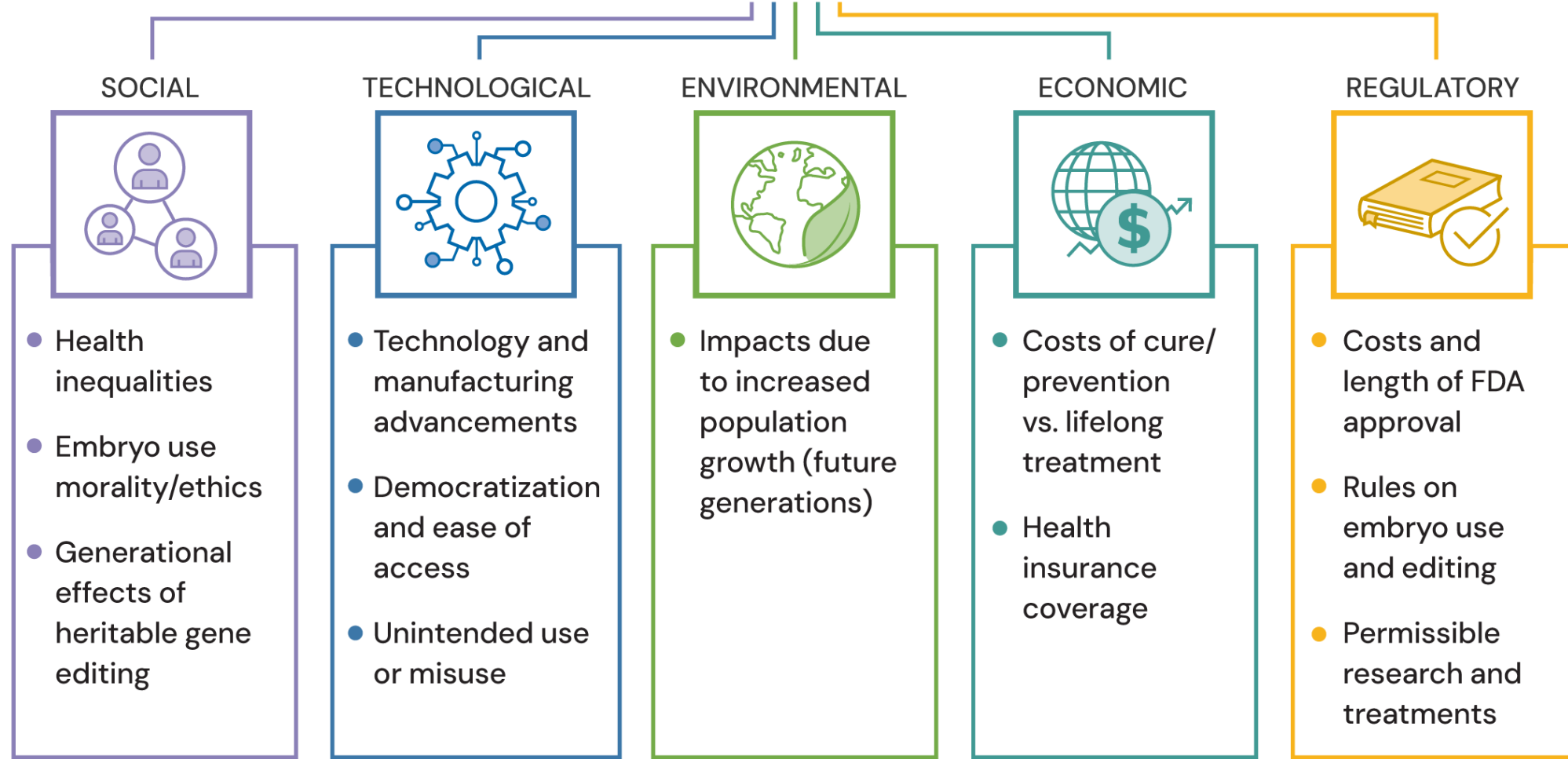
EMERGING TRENDS

Source: AntonKhrupinArt/stock.adobe.com (atom), GAO (icons).

Space-based manufacturing of semiconductor crystals

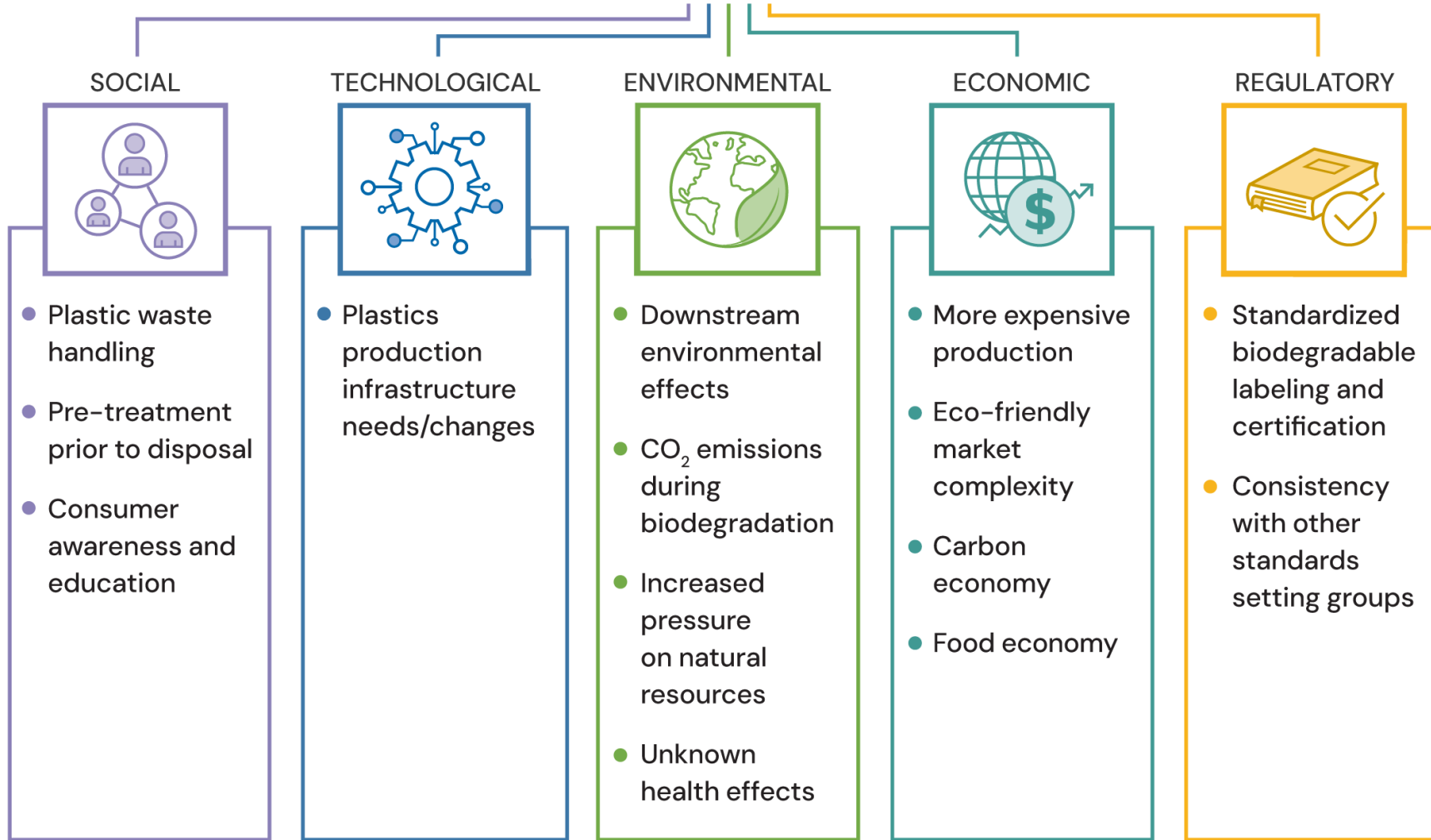


Gene editing to treat or prevent disease



Source: GAO (icons). | GAO-25-107542

Biodegradable bioplastics



Source: GAO (icons). | GAO-25-107542



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We are committed to providing insight into technologies that could have significant impacts on Americans in the long term. We issued our first On the Horizon report in November 2024.





Thank you!