INTRODUCTION - THE ARL/CNI SCENARIOS

SCENARIO PLANNING AND PREPARING FOR CHANGE

Leadership today demands more than responding to change—it requires anticipating it, shaping it, and sometimes preparing for futures we cannot fully predict. In a time marked by accelerating technological development, shifting research and learning models, geopolitical uncertainty, and demographic transformation, traditional planning tools often fall short. Forecasts feel outdated before they're published. Strategic plans can become rigid in the face of rapid disruption.

That's why scenario planning matters.

Scenarios offer leaders a powerful way to think beyond the short term. They help institutions imagine multiple plausible futures, shaped by different combinations of trends, disruptions, and choices. Scenarios don't predict what will happen—they illuminate what could happen. And that opens the door to smarter, more adaptive strategies.

This toolkit introduces four 2035 scenarios focused on the evolving role of artificial intelligence in the research and knowledge ecosystem. Each scenario describes a future in which AI has reshaped higher education, scholarly communication, workforce structures, and the public's relationship to knowledge in distinct ways.

WORKING WITH SCENARIOS

Scenarios are one of the most powerful tools in the futurist's toolkit. They are not predictions or bets on what will come to pass. Instead, they are structured stories that describe a range of plausible futures, based on key uncertainties and emerging trends.

By exploring these divergent futures, leaders can:

- Challenge assumptions that may no longer hold in a changing world.
- Test strategies against multiple conditions, identifying robust and flexible responses.
- Uncover opportunities and risks that are hidden by conventional thinking.
- Build shared language and insight across diverse leadership teams.
- Encourage proactive and ethical decision-making, especially when technologies like AI reshape the foundations of research, teaching, and knowledge production.
- Scenarios help us stretch our thinking without drifting into fantasy. They keep us grounded in real-world drivers while opening space for creativity, caution, and innovation.

WORKING WITH SCENARIOS

You'll use scenarios not as answers, but as testing grounds:

- What if this future came to pass—are we ready?
- What strategies would thrive here? What would fail?
- What investments should we make now to prepare for more than one possible future?

This approach enables leaders to:

- Stress-test existing strategies against diverse futures
- Identify "no-regrets" moves that are valuable across scenarios
- Spot contingent or high-risk strategies that require monitoring or caution
- Challenge assumptions and encourage long-range thinking
- Create space for innovation grounded in emerging needs and signals

This toolkit offers a structured pathway to guide that work. Whether used during a strategic planning retreat, a leadership development session, or a program prioritization process, the tools and exercises included here are designed to spark insight, provoke reflection, and support action.

WORKING WITH SCENARIOS

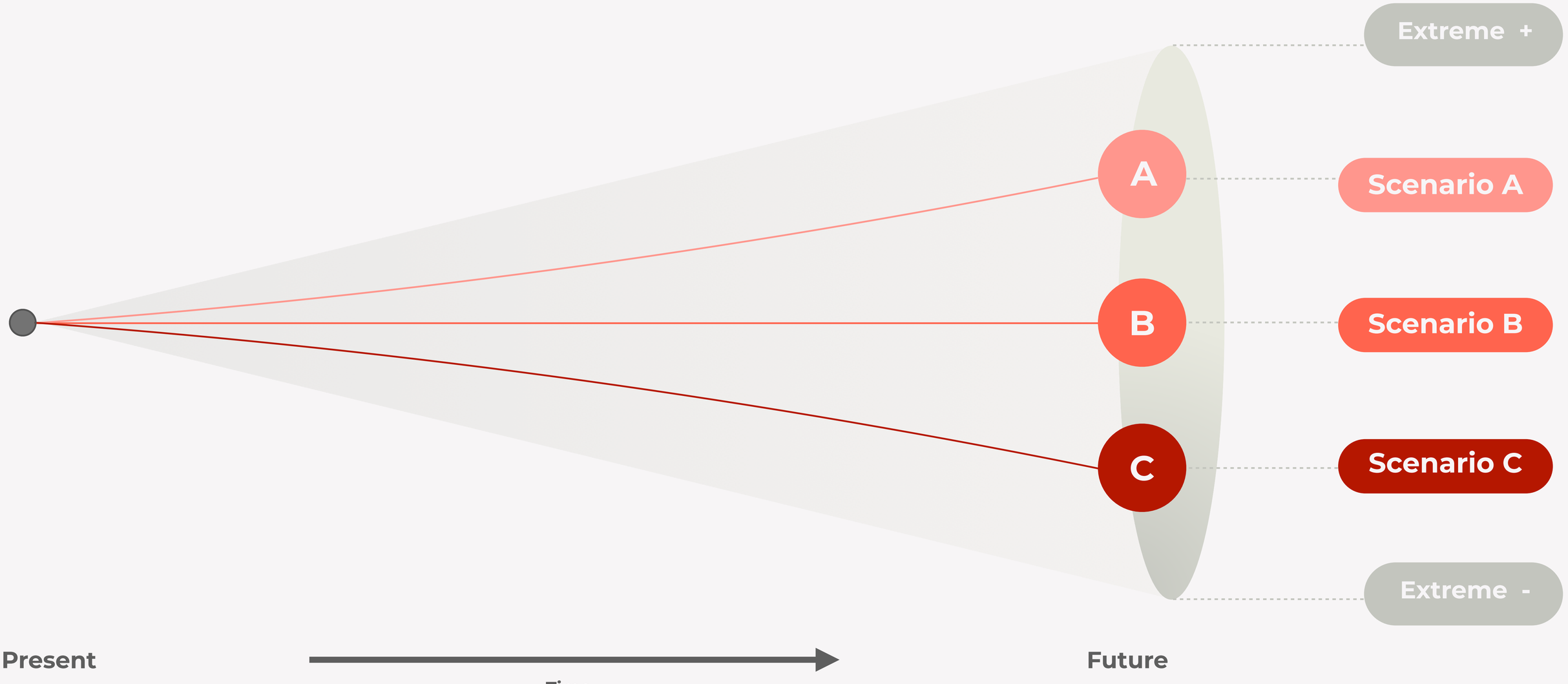
The Scenario Cone is a visual representation of how the future unfolds—not as a single inevitable path, but as a widening field of possibility. As we move forward in time, the uncertainty we face naturally increases. The cone captures this by illustrating a range of potential futures that stretch from probable to plausible to preferable (or undesirable), reminding us that the further we look ahead, the more open the future becomes.

At the narrow end of the cone is the present moment. Here, our strategies are typically based on trends, forecasts, and current priorities. But over time, reliance on a single forecast becomes riskier. Change accelerates, interactions between systems grow more complex, and black swan events (like pandemics or AI breakthroughs) can shift trajectories quickly.

The cone encourages us to:

- Recognize multiple plausible futures rather than relying on a single “most likely” outcome.
- Stretch our thinking beyond extrapolation and into exploration.
- Acknowledge uncertainty not as a weakness in planning, but as a space for strategic insight and resilience.

THE SCENARIO CONE

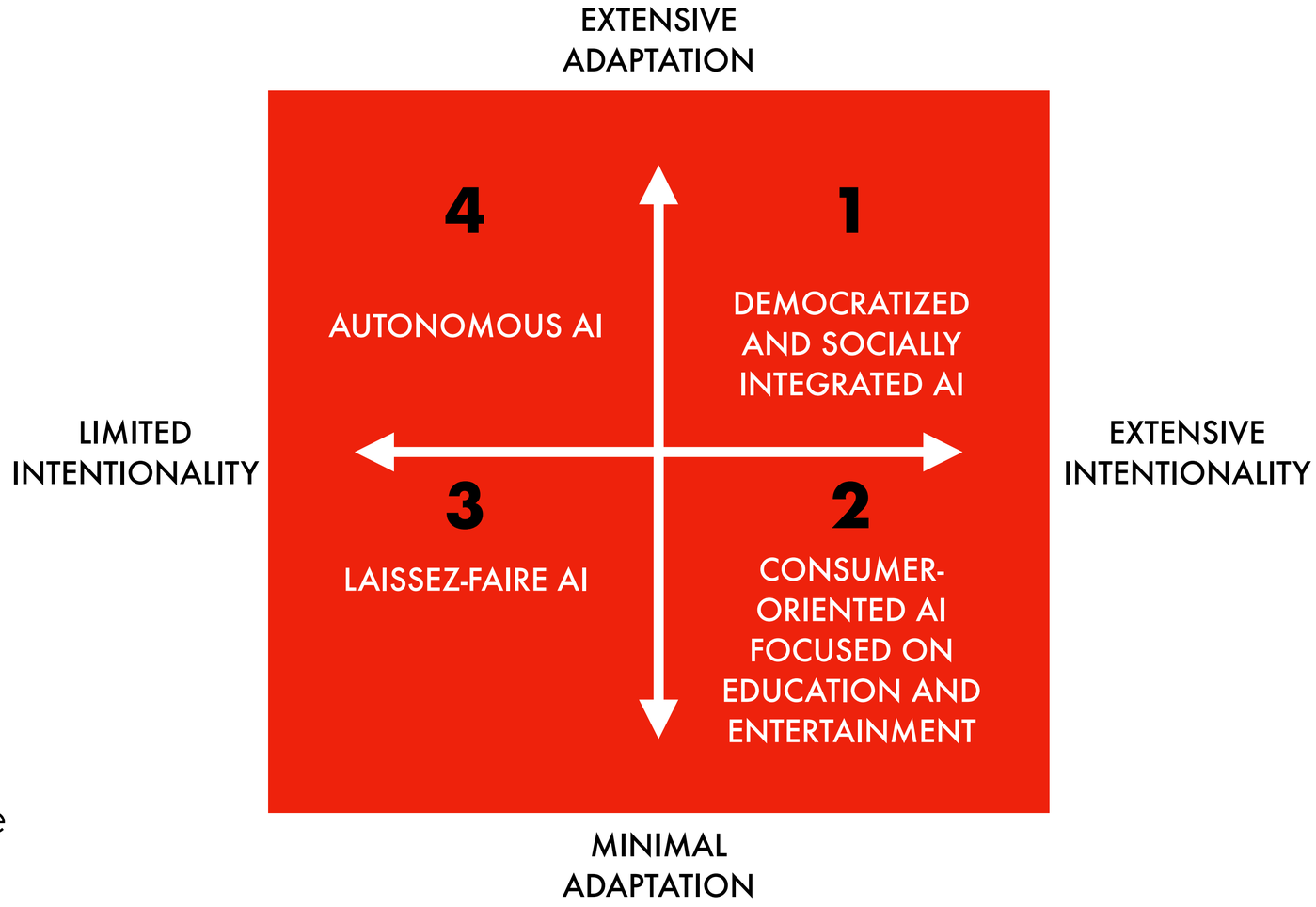


Adapted from Hancock and Bezold, 1994

THE ARL/CNI SCENARIOS: AI-INFLUENCED FUTURES

This set of scenarios was developed by the ARL/CNI Joint Task Force on Scenario Planning for AI/ML Futures and released in June 2024. Scenario planning was used to imagine a future influenced by artificial intelligence (AI) and to explore the range of uncertainty associated with AI in the research and knowledge ecosystem. These scenarios were developed from a North American perspective through deep engagement with the CNI and ARL membership.

Each scenario is developed from two critical uncertainties facing the environment during the next ten years. The first of these, **Societal Intentionality of AI Process and Design**, considers whether process and design will be anticipative of societal needs and aspirations or will it be limited? The second, **Societal Adaptation of AI**, explores the extent to which society will adopt, and adapt and respond to AI.



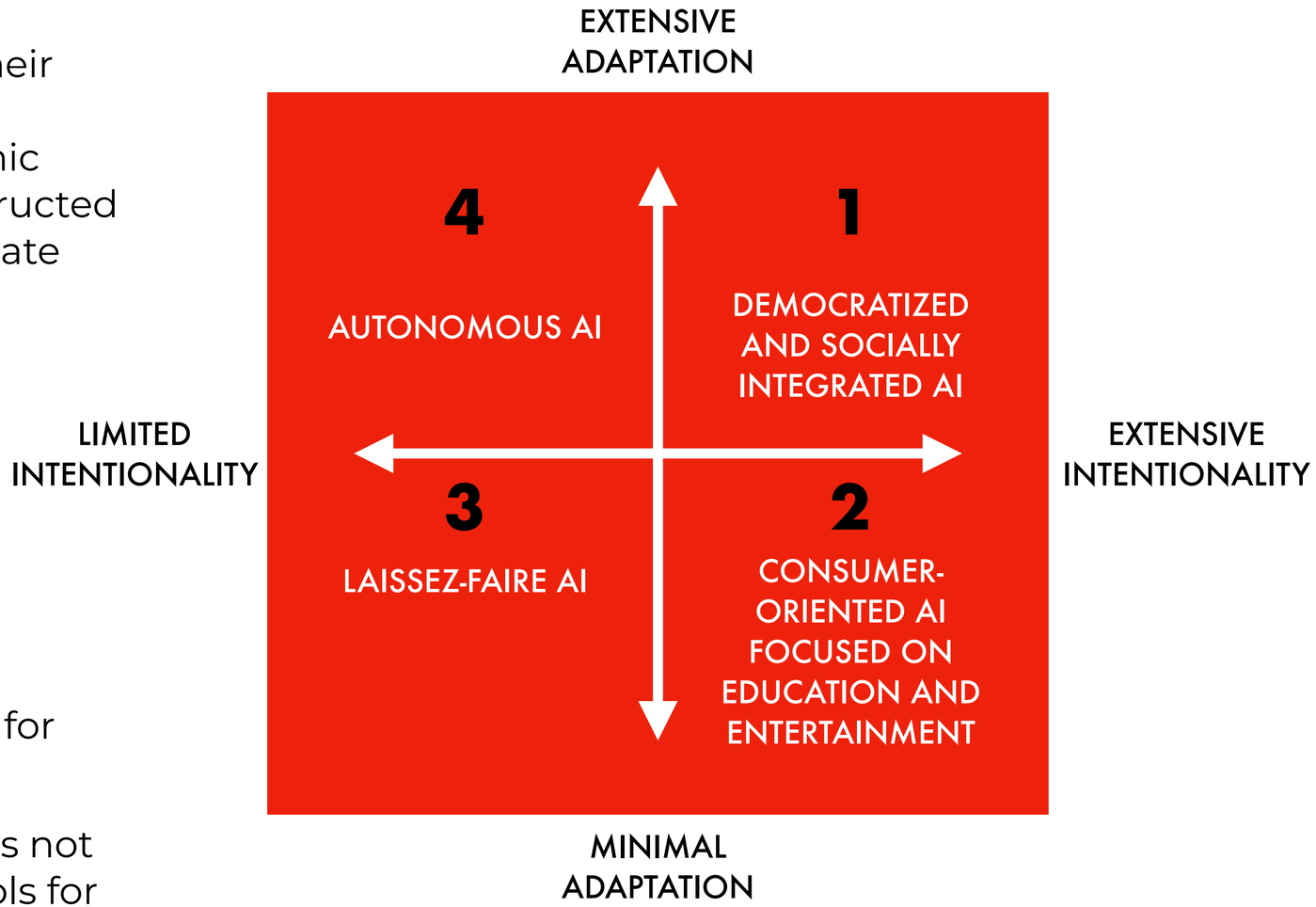
THE ARL/CNI SCENARIOS: AI-INFLUENCED FUTURES

By placing these uncertainties on two axes, we generate four quadrants—each representing a distinct future world in the year 2035. These scenarios explore different trajectories for AI's role in research universities and their libraries, considering implications for services, infrastructure, partnerships, and the broader academic mission. They are not predictions, but carefully constructed possibilities that help us ask better questions, anticipate challenges, and identify robust strategies across an uncertain future landscape.

Importantly, all four scenarios are:

- Plausible: rooted in emerging signals and current trajectories.
- Divergent: highlighting meaningful differences in values, behaviors, and outcomes.
- Relevant: designed to surface insights and actions for today's leaders.

This toolkit invites you to engage with these scenarios not as distant hypotheticals, but as strategic mirrors—tools for reflection, stress-testing, and charting a course through uncertainty



EXPLORE THE SCENARIOS - INFORMATION IN THE REPORT

Each of the four scenarios is presented in narrative form, explaining the world in 2035. They occupy different points within the plausible space of the cone. The impact of AI on research and researchers and the response of libraries are presented in a structured way. The positives and negatives of the scenario are clearly expressed.

Following the scenario narrative are some key elements:

Current Drivers and Trends Signaling the Potential of This Scenario - the evidence gathered in the first months of 2024 that pointed to this scenario unfolding. Further information is available in the Strategic Context and Provocateur Interview reports available from the website.

Some Strategic Questions for the ARL and CNI Communities to Consider - how might libraries and the broader research and knowledge ecosystem respond? These are helpful questions for in-house planning exercises.

Alex's Experience in This Scenario... describes the working environment of Dr Alex Rutherford, director of the Horizon Innovations Foundation (HIF). A vignette of Alex's life and work is presented alongside each of the four scenarios.

An end-state table is presented as an Appendix to the scenarios, showing how different environments (such as learning, research, and the role of libraries) might look in each of the four scenario worlds. The information in this table can be helpful in considering strategic directions.

THE ARL/CNI SCENARIOS: AI-INFLUENCED FUTURES

Several documents are available from the ARL/CNI scenario website which provide a critical asset for research libraries and organizations aiming to strategically plan for the transformative power of artificial intelligence.

The Final Scenario Set: This final scenario set explores potential futures where AI plays a pivotal role, providing critical insights into the evolving challenges and opportunities for the research environment.

The Strategic Context Report: This report summarizes community feedback gathered through focus groups and interviews about an AI-influenced future for the research environment that were held in winter 2023–24 and spring 2024.

The Provocateur Interview Report: Featuring forward-thinking dialogues with industry leaders, these interviews challenge conventional wisdom and stimulate stretch thinking with regards to an AI-influenced future.

https://www.arl.org/resources/the-arl-cni-2035-scenarios-ai-influenced-futures-in-the-research-environment/

DEMOCRATIZED AND SOCIALLY INTEGRATED AI

an unprecedented integration of human and computational capabilities

By 2035, society has embraced a collaborative, anticipatory approach to AI design and deployment, resulting in widespread, responsible integration of AI into daily life. Breakthroughs in augmented reality and human-computer interfaces enable seamless partnerships between people and machines, enhancing research, creativity, and decision-making. Public and private sectors—including governments, academia, and civil society—have established shared norms around transparency, privacy, and open access, supporting AI development aligned with societal values. Public trust in AI is bolstered by broad digital literacy and participatory policymaking, although tensions persist around pace and enforcement.

Research becomes more interdisciplinary and open, with innovations rapidly commoditized for the public good. Libraries serve as dynamic hubs connecting researchers and learners to data, tools, and evolving knowledge. While AI-enhanced humans transform many sectors, those in unaffected roles remain stable. Investment in upskilling ensures broad adaptation. Cautious progress continues on brain-computer interfaces, amid deep ethical concerns. Despite imperfections and global disagreements, this scenario reflects a world where inclusive governance and collaborative innovation unlock AI's potential to address humanity's greatest challenges.

CONSUMER-ORIENTED AI FOCUSED ON EDUCATION AND ENTERTAINMENT

AI's systematic impact on the research and knowledge ecosystem is relatively low

In this 2035 scenario, AI's greatest impact is in consumer markets—particularly entertainment, social media, and informal education—rather than in research or scholarly work. Public skepticism and low digital literacy slow AI adoption in more consequential areas, while tech companies prioritize profitable, low-risk applications. AI-powered tools deliver immersive experiences and hyper-personalized virtual environments, reshaping how people interact, learn, and spend time. Innovations like LAZARUS offer vivid re-creations of ancestors or historical figures for entertainment and edutainment. Research activity is increasingly consolidated in elite university-tech alliances or private labs with access to expensive AI infrastructure, sidelining smaller players.

The broader population accesses affordable, AI-driven learning platforms that bypass traditional education models. Meanwhile, a tech-identified elite receives advanced training and retains access to top-tier institutions. Libraries serving these elite institutions offer sophisticated AI-enhanced tools, while public institutions and community colleges struggle for relevance and funding. Government oversight remains minimal, deferring to industry expertise. Despite growing inequality, tech companies work with select partners to address climate and security concerns. The result is a commercially vibrant but unevenly distributed AI landscape, defined more by consumption than discovery.

LAISSEZ-FAIRE AI

a world of missed opportunities, bad decisions, and fecklessness

In this scenario, the world in 2035 is shaped by regulatory failure, widespread distrust, and missed opportunities. AI adoption has been rapid but reckless, driven more by hype than thoughtful oversight. Neither governments nor society effectively addressed the harms of earlier technologies, leaving AI systems riddled with bias, dysfunction, and privacy violations. AI is embedded across sectors, but humans manage these tools irresponsibly, and decision-making often lacks critical scrutiny. Innovation benefits the wealthy and well-connected, while vulnerable populations suffer the consequences of poorly designed systems.

Outrage over egregious failures occasionally sparks haphazard legislation, resulting in a chaotic patchwork of controls. Misinformation proliferates, national security threats grow, and trust in both government and tech companies collapses. Research continues in fragmented ways: elite institutions develop proprietary models, while smaller institutions struggle with limited open tools. Funding is scarce and erratic. Research libraries face budget constraints, reduced autonomy, and a shift toward supporting basic curricular integrity. In sum, this is a disordered and inequitable world—rich in technology but impoverished in foresight, governance, and shared purpose.

AUTONOMOUS AI

AI is an increasingly independent partner and collaborator in research and learning

By 2035, AI has become an increasingly autonomous and indispensable collaborator in research, learning, and daily life. Although artificial general intelligence (AGI) has not been fully realized, AI systems exhibit growing independence—generating new knowledge, products, and services valued by both humans and machines. Open access to data and knowledge expands under AI stewardship, but access for humans remains uneven. Society has yet to reach consensus on AI's autonomy or rights, and many remain unaware of AI's pervasive influence. Digital literacy is emphasized in early education, preparing citizens to navigate AI-enhanced environments.

In research, AI copilots evolve into collaborators and, in some cases, leaders. Human research roles decline due to cost pressures and workforce restructuring, while AI-enhanced teams drive massive productivity gains in some disciplines. Scholarly communication fragments into modes for human, AI, and hybrid audiences. Libraries and research infrastructure are deeply integrated into AI platforms, with traditional functions deconstructed and absorbed. This is a world marked by remarkable progress and profound uncertainty, where humans must continually redefine their roles, values, and aspirations alongside increasingly capable AI collaborators.