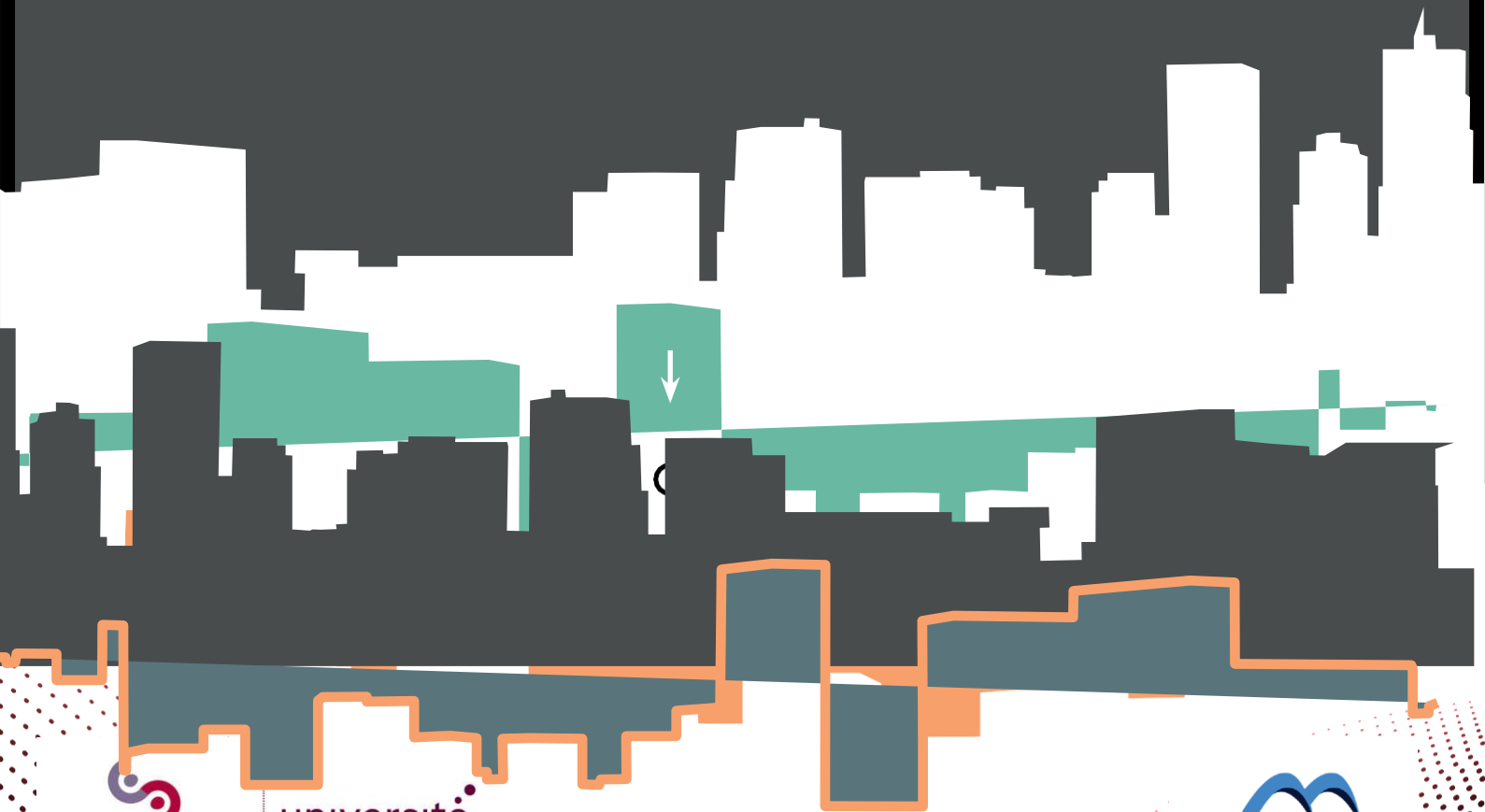


Exploring new futures through collective decision-making,
inspired by concepts from quantum Physics

SCENARIO 2050

Deciding & cooperating in an unpredictable world



CentraleSupélec

université
PARIS-SACLAY

SYNTHESIS WHITE PAPER

January 2026

B4 UTATIONS

On November 28, 2025, as part of the Ethics and Responsibility seminar at CentraleSupélec Paris-Saclay, one of France's leading engineering schools, a collective decision-making workshop brought together thirty-one engineering students around a central question: **How can we make collective decisions in an unpredictable and interconnected world?**

Designed and facilitated by Sonia EYAAN BOURDAUD, the workshop offered an immersive experience in exploring and constructing possible futures for the year 2050.

The process drew on metaphors inspired by quantum physics to explore the coexistence of multiple possibilities, the interdependence of choices, and the stabilization of decisions under constraints.

The students' work was subsequently analyzed and consolidated into a 70-page white paper.

This document provides a summary of its main findings and insights.

ACKNOWLEDGEMENTS

This project is the result of many exchanges, forms of support, and sources of inspiration. I would like to express my deep gratitude to Hervé ZWIRN, physicist and epistemologist, for the quality of his feedback, which helped anchor this work within a rigorous intellectual framework. Mr. Zwirn notably applied the formalism of quantum mechanics to the field of decision theory.

My sincere thanks go to Patrick CORSI, expert in complex innovation and advanced design (former IBM Research, European Commission, etc), for his unwavering support and his ability to challenge the project with precision throughout its development.

I also wish to thank Jean-Marc CAMELIN for his trust, without which this project could not have taken place within CentraleSupélec Paris-Saclay, as well as Anne SPASOJEVIC DE BIRE, whose early support during my first steps at the institution was decisive and infused the project with a deeply positive dynamic.

My gratitude goes to Valérie FERT and Thierry LORHO, my long-standing companions on this journey, who introduced me more than ten years ago to the combined perspectives of information theory, quantum decision theory, and actor-network theory, through the predictive AI Mileva they created in 2011.

I would also like to thank Ines DAUVERGNE and Joanne RYCKELYNCK for their exchanges and contributions.

Finally, my warmest thanks go to all the students for their engagement, curiosity, and the seriousness with which they took part in the exercise. Their work constitutes the living substance of this white paper



CONTEXT AND INTENT

We are entering an era of permanent uncertainty, marked by profound and simultaneous transformations

- **Climate urgency** and the energy transition,
- the rapid rise of **generative AI** and **work automation**,
- **Economic pressures** and the transformation of financial models,
- Increasing **geopolitical instability**,
- **Social transformations** and the emergence of new human expectations.

These dynamics do not merely add up: they **interact, amplify, and disrupt one another**, making decision-making environments increasingly complex, non-linear, and unpredictable.

They deeply transform organizations as well as professions, including those of engineering, research, and the management of complex systems. Engineers are no longer only expected to optimize technical solutions within well-defined frameworks; they are increasingly confronted with **systemic choices** involving economic, social, environmental, ethical, and even geopolitical dimensions.

Tomorrow, CentraleSupélec students — future engineers, researchers, entrepreneurs, and decision-makers — will be required to design technologies, steer organizations, and orient industrial or energy policies, often **without complete data**, without certainty regarding medium or long-term consequences, and within environments shaped by **contradictory demands**.

It is within this context that the project took shape. It was born from a strong conviction: we cannot address the challenges of an unpredictable world using **modes of thinking that fragment reality and isolate interdependent phenomena**. From the earliest stages of training, it therefore becomes necessary to explore new ways of approaching decision-making — not to eliminate uncertainty, but to learn how to **navigate it collectively and responsibly**. The ambition is to provide participants with an experiential space in which they can explore alternative ways of making decisions, navigating trade-offs, and cooperating in complex and uncertain environments.

This work is also inspired by the concept of Futures Literacy developed by Riel Miller [1]. From this perspective, the future is not something to be predicted, but a resource that can be used to reveal hidden assumptions, challenge existing frames of reference, and broaden the spectrum of possible futures. Exploring multiple futures thus becomes a process of collective learning, enabling participants to better understand the decisions, uncertainties,

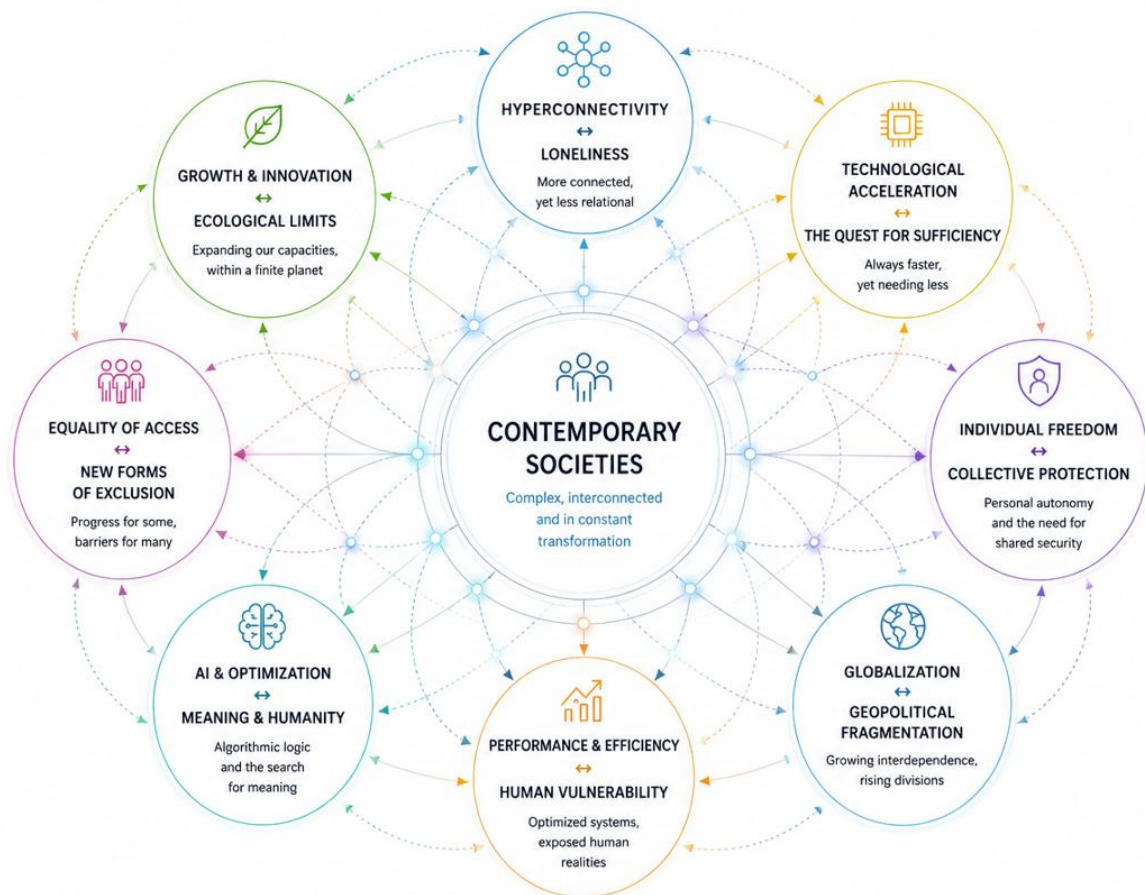
and opportunities that shape the present.

The ideas, scenarios, and proposals presented in this white paper are derived from the work of the students who participated in the workshop. Their content has been faithfully preserved.

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THE ARCHITECTURE OF CONTEMPORARY PARADOXES

Interconnected tensions shaping our collective futures



SETTING THE SCENE

To open this space for reflection, participants were invited to adopt a shift in perspective. Our reality can be understood as the coexistence of two worlds:

- **the visible world**, governed by the laws of classical physics — where an apple falls and trajectories, causes, and effects can be predicted.

- **the quantum world**, the realm of the infinitesimally small, where the rules change: objects can coexist in multiple states, interact at a distance, and transform at the moment of observation.

As in the quantum world, ideas are invisible, fragile, and initially exist only as potential. They fully exist only when they are shared, brought into resonance, and confronted with other ideas and with their environment.

Without seeking to transpose quantum mechanics into a scientific model of decision-making, we drew on principles derived from this branch of physics as **symbolic frameworks and metaphors** for thinking differently about complexity, interdependence, and unpredictability, and **for enabling the emergence, exploration, and stabilization of possible states**.

Building on this perspective, several so-called quantum-like approaches, developed in cognitive science and decision theory, draw on mathematical formalisms inspired by quantum physics to describe highly contextual and non-linear human systems. Rather than applying quantum mechanics to human behavior in a literal sense, these approaches use concepts such as superposition, contextuality, and entanglement as conceptual and probabilistic frameworks for understanding the complexity of decision-making processes.

Hervé Zwirn [2] has shown how the formalism of quantum mechanics can be applied to decision theory, offering an alternative framework for modeling choices under uncertainty. Jean-Louis Basdevant's book provides a comprehensive presentation of quantum formalism [3]. Diederik Aerts demonstrated that concepts such as superposition, interference, and entanglement can account for conceptual combinations that cannot be adequately described through classical compositional models [4]. Jerome Busemeyer and Peter Bruza further developed quantum cognition as a dynamic probabilistic framework for modeling human judgment, reasoning, and decision-making [5,6]. These approaches have subsequently been reviewed and consolidated within the broader field of quantum cognitive modeling [7]. Likewise, Andrei Khrennikov emphasizes that quantum-like models are not quantum physical models, but contextual probabilistic models that can be applied to psychological, social, economic, and financial phenomena [8].

METHODOLOGY

Five notions, presented below in a concise and simplified way, structured the entire process. Each of them was translated into a concrete experience lived by the participants



Joyful intention — an Ethical Compass

Intention is not a concept from quantum physics, but a deeply ethical one. As developed by Spinoza in Ethics, joy is not mere fleeting pleasure; it is what **increases our power to act**. It thus becomes an inner compass.

Participants — thirty-one students — opened the workshop by individually formulating a joyful intention: a sentence expressing **how** they wished to contribute positively to a desirable future by 2050.



Superposition — Embracing multiple possible futures

In quantum physics, a system can exist simultaneously in several states. This is known as the principle of superposition. The most well-known metaphor is Schrödinger's cat, which is both alive and dead as long as no observation has taken place. More simply, as long as reality has not yet imposed itself, multiple possibilities coexist.

This can also be illustrated through an everyday situation: a woman awaiting the result of a pregnancy test. Until the result is known, she can imagine her future unfolding along several radically different paths.

In the same way, students were invited to imagine multiple potential futures for the year 2050, without attempting to choose between them. As long as these futures had not been confronted with reality, they all coexisted as latent possibilities.



Entanglement — Recognizing our choices are never isolated

In quantum physics, entanglement refers to a phenomenon in which two particles that have interacted become linked: the state of one instantaneously influences the state of the other, regardless of the distance separating them.

Within the workshop, this was of course not a matter of teleportation, but rather a concrete metaphor for interdependence. The groups were "entangled": each team randomly drew the collective intention of another group and had to integrate it into its own scenarios. This step brought about an essential realization: our choices are never isolated. They are

always embedded within a network of interactions, influences, and systemic consequences.



Decoherence — Confronting possibilities with reality

In quantum physics, a superposition does not always survive interaction with its environment. As long as a particle remains isolated, multiple states may coexist. However, once it interacts with its environment, the superposition collapses: some possibilities disappear, and only one becomes real. This process is known as decoherence.

Let us return to the pregnancy test example: before the result, several futures remain possible; afterward, reality asserts itself. This is neither a success nor a failure, but rather a transition from possibility to reality, one that calls for adaptation.

During this phase of the workshop, each group drew either an “environment” card (climate, economy, geopolitics, society, etc.) or a “surprise” card (UFOs, radical discoveries, exogenous events). The scenarios were then confronted with these constraints: did they collapse, adjust, merge, or transform?



Synchronicity — Allowing collective meaning to emerge

Synchronicity is not a concept from quantum physics. It was introduced by psychiatrist Carl Gustav Jung, who described it as a “meaningful coincidence.” Together with physicist Wolfgang Pauli, they notably drew on phenomena such as entanglement to describe the significant coincidences experienced in human lives.

But what is synchronicity? Imagine suddenly thinking about a friend you have not seen in years, only to unexpectedly run into them the very same day — a common example of a meaningful coincidence.

In this workshop, synchronicity is not understood as an exceptional phenomenon, but as an interpretive lens through which meaningful resonances and convergences emerging independently across multiple groups can be identified and analyzed.

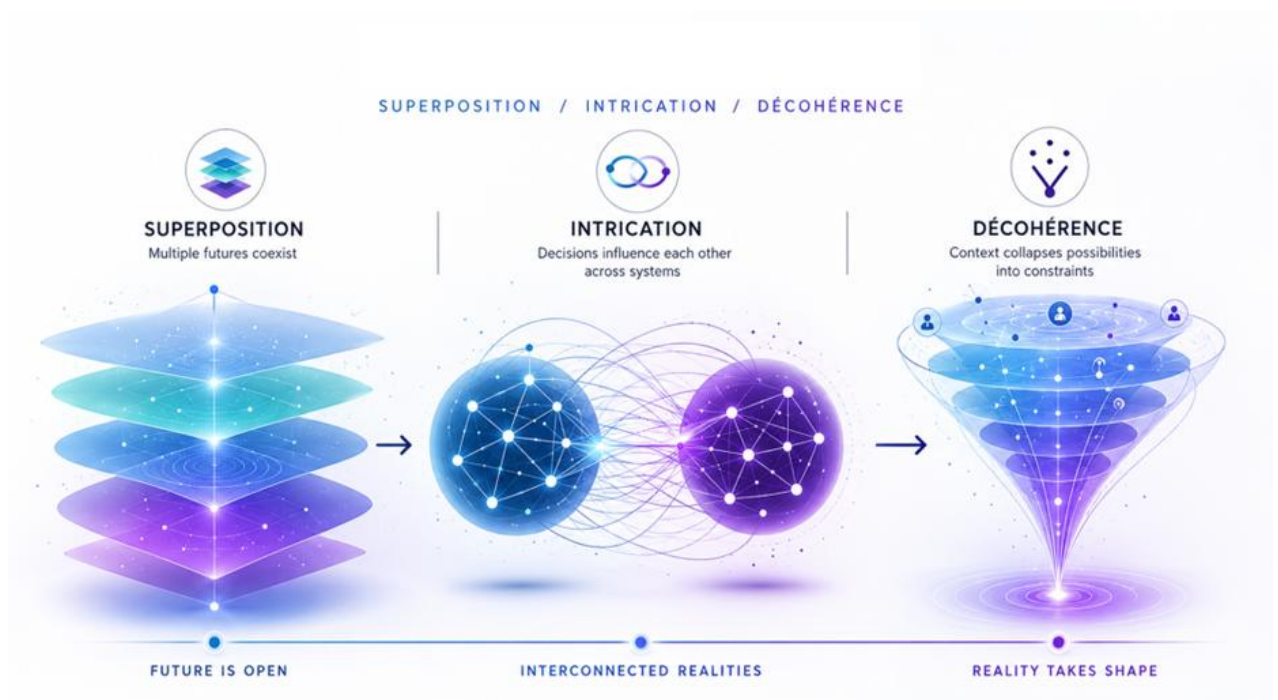
OBJECTIVES

The workshop aimed to offer students an experiential space to:

- Explore alternative ways of relating to choice, renunciation, and ambiguity,
- Develop a reflective stance toward the ethical responsibilities that will accompany

their future roles as engineers and decision-makers,

- Engage with augmented collective intelligence,
- Develop the ability to navigate ambiguity,
- Construct scenarios that are simultaneously desirable, sustainable, and responsible.



WORKSHOP STRUCTURE

The workshop was designed as a progressive journey, alternating between individual reflection, collective intelligence, and confrontation with reality. Each step corresponded to one of the key notions presented above, translated into a concrete experience.

Step 1: Individual intention: establishing an ethical compass

The workshop began with a phase of individual reflection.

Each participant was invited to formulate a **joyful intention** with a positive contribution to the 2050 horizon. This intention was to be neither a precise project nor a measurable objective, but rather an ethical direction — not “creating a technology,” but “contributing to reconnecting humans with one another through technology.”

This individual phase created a space of sincerity and personal responsibility, an essential prerequisite for any form of collective intelligence.

Step 1 bis: Collective intention: bringing forth a shared direction

Participants were then divided into teams. Within each group:

- each participant reads their intention aloud,
- intentions were listened to without debate or judgment,
- the group selected the intention that resonated most, or formulated a synthesized collective intention.

This transition from the individual to the collective constituted an initial experience of shared decision-making:

- renouncing certain ideas,
- accepting an imperfect but common direction,
- learning to recognize resonance rather than majority rule.

The collective intention became the group's compass for the remainder of the workshop.



Step 2: Superposition: Exploring Multiple Possible Futures

Based on their collective intention, each team imagined two to three future scenarios for the year 2050. The instruction was explicit: not to choose, optimize, or make the scenarios coherent with one another.

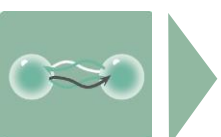
These futures were conceived in **superposition**:

- sometimes technological,
- sometimes sober or low-tech,
- sometimes utopian,
- sometimes deliberately paradoxical.

For each scenario, teams explored:

- the central idea,
- the context,
- concrete examples,
- what made the future desirable or joyful,
- ethical risks and paradoxes.

This step helped defer premature decision closure and cultivate the ability to hold multiple possibilities in tension.



Step 3: Entanglement: accepting that choices are never isolated

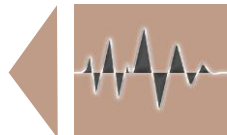
The teams were then entangled with one another. Each group randomly drew the collective intention of another team, which it had to integrate into its own scenarios, even if this created discomfort or dissonance.

This step highlighted a fundamental reality: decisions are always situated within a network.

The scenarios evolved accordingly:

- some were enriched,
- others were weakened,
- new ethical tensions emerged.
- The ambition of this phase is to provide a concrete experience of the systemic interdependence of collective choices.

Step 4: Decoherence: confronting futures with constraints of the real



Teams then confronted their scenarios by drawing “environment” cards — climate, economy, society, geopolitics — sometimes supplemented by surprise cards (technological ruptures, radical discoveries, exogenous events)).

In response to these perturbations, groups observed:

- which scenarios collapsed,
- which adjusted,
- which merged or transformed.

This step embodied the notion of decoherence. When confronted with reality, not all possibilities survive. It also revealed the groups’ capacity for adaptation, renunciation, and creativity.

Step 5: Synchronicity: Allowing collective meaning to emerge



It also revealed the groups’ capacities for adaptation, renunciation, and creativity. Finally, a collective sharing phase made it possible to identify synchronicities across the teams. Representatives from each group compared their final scenarios in order to identify:

- themes that emerged simultaneously,
- shared values,
- an uncoordinated common vision.

These resonances made it possible to identify collective lines of force, revealing deep and widely shared concerns.



INTENTIONS, ENTANGLEMENTS AND FINAL CHOICES

The table below presents the collective intentions that guided each team, the expanded intentions that emerged through the entanglement phase, and the scenarios ultimately selected after decoherence.

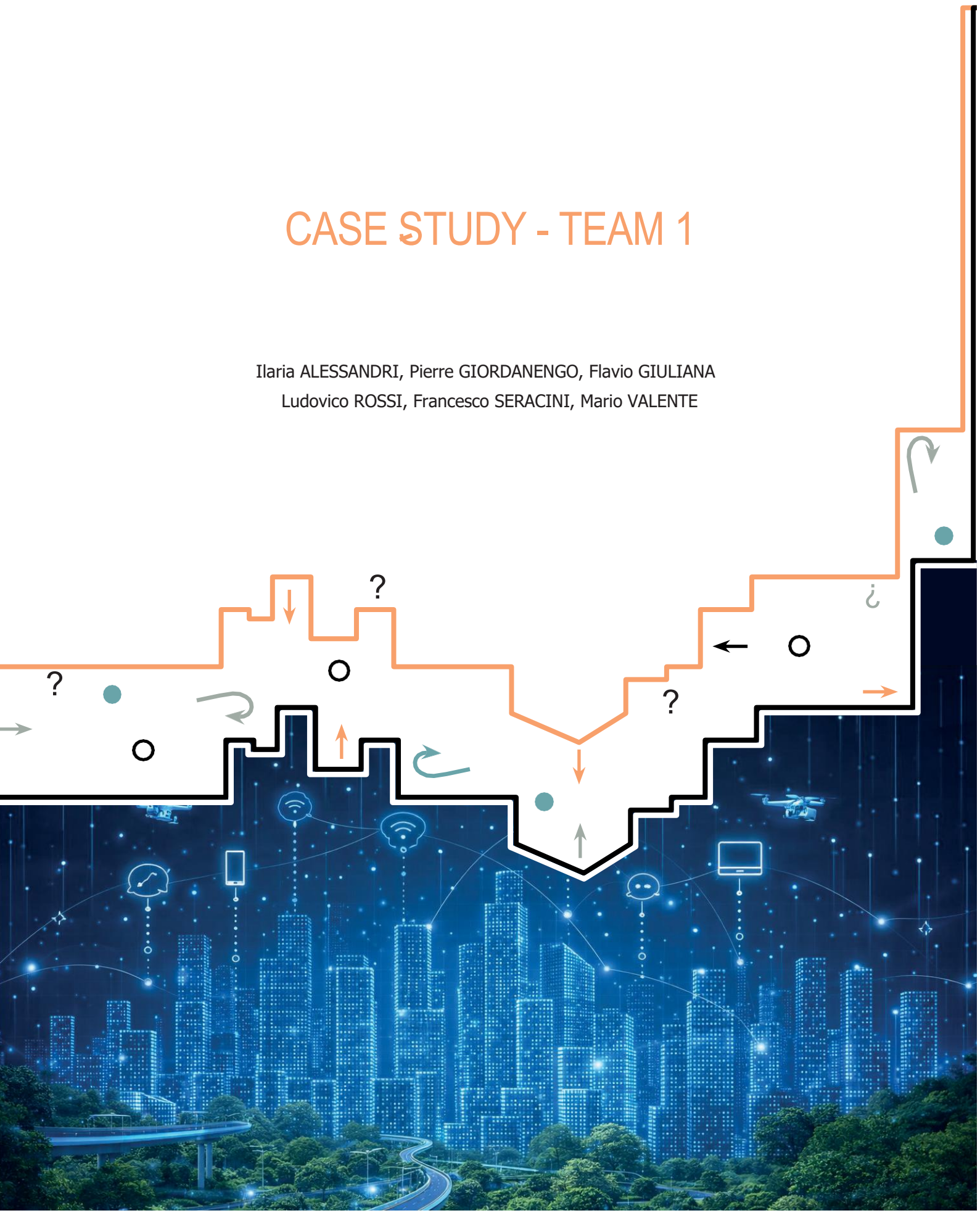
Summary Table – Intentions, Entanglements and Final Scenarios

Team	Collective Intention	Expanded Intention After Entanglement	Final Scenario After Decoherence
1	everyone to access education and technology in a simple and equitable way.	Enable everyone to access education and technology in a simple and equitable way, while addressing the challenges of ageing, intergenerational connections, and the risk of age-related digital exclusion.	Cognitive implants for babies and seniors
2	Combat human loneliness.	Combat human loneliness while making the workplace more human-centered and environmentally responsible.	Frictionless intergenerational connections
3	Develop technologies capable of supporting older adults and individuals with health vulnerabilities.	Develop technologies to support older adults and vulnerable individuals while integrating issues of equality, collective governance, and social justice.	Predictive care under collective governance
4	Encourage people to become more attentive to their environment, their relationships, and their connection to nature.	Develop education and technologies that encourage people to become more attentive to their environment, both in human relationships and in their relationship with nature.	Reconnection with the living world
5	Transform the capitalist system to build a more socially and environmentally just world.	Transform the capitalist system to build a more socially and environmentally just world, with a strong emphasis on human connection, cooperation, and the fight against social isolation.	Nova DODO, the sustainable post-capitalist

Despite the diversity of futures imagined, the teams quickly encountered similar dilemmas: how can innovation be reconciled with individual freedom? How can human connection be preserved in technologically advanced societies? How should trade-offs be made between efficiency, equity and sustainability? These recurring tensions provided the first indications of a deeper collective structure, which will be explored in the following sections.

CASE STUDY - TEAM 1

Ilaria ALESSANDRI, Pierre GIORDANENGO, Flavio GIULIANA
Ludovico ROSSI, Francesco SERACINI, Mario VALENTE





Step 1 - Collective intention



1

Ensure that everyone has simple and equitable access to education and technology.

Step 2 - Superposition: Three possible futures

Scenario 1: Cognitive chip implant at birth

- **Central idea:** a nanochip is implanted in every child at birth, regardless of origin or social class, to connect the child to a powerful digital brain. These chips, capable of immense potential, are deliberately limited to fundamental knowledge: reading, mathematics, general knowledge, and basic logic.
- **Context:** The miniaturization of implants is already widely accepted in the medical field, even though their use for other purposes remains marginal or controversial today.
- **Example:** A person wonders, "How many inhabitants does Paris have?" and the information is instantly accessible in their mind.
- **What makes this future joyful:** Human potential is dramatically expanded, learning is accelerated, and extraordinary achievements become possible.
- **Paradox / Risk:** The chips can be deactivated or paused at any time by their user once they reach a certain age. This results in a loss of cognitive efficiency but allows the individual to remain authentic.

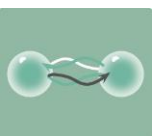
Scenario 2: AI-Free egalitarian school-cities

- **Central idea:** The Authority for Equitable Education creates school-cities where all children, from the age of six, live and study under identical conditions. Artificial intelligence is prohibited to guarantee equal, unassisted cognitive development.
- **Context:** The Citadels of Equality are isolated, uniform, and self-sufficient campuses where students remain throughout the year, returning home only for brief periods. The AEE controls every aspect to prevent any social, economic, or technological advantage.

- **Example:** In the Citadel of Paris, twelve-year-old students design an irrigation system without AI, relying on books, experiments, and debates. In doing so, they learn cooperation as much as scientific principles.
- **What makes this future joyful:** Citizens develop strong critical thinking skills; society becomes more coherent and equitable, with individuals possessing comparable competencies.
- **Paradox / Risk:** Family separation and the prohibition of AI generate new imbalances and raise questions about freedom and education.

Scenario 3: World Organization for Education and Access to Information

- **Central idea:** The creation of a World Organization for free access to education and information.
- **Context:** Following major conflicts, states decide to redirect funds previously allocated to armaments toward the creation of a global organization dedicated to education. This organization invests in the development of knowledge and provides technological resources adapted to the socio-economic contexts of the most disadvantaged populations.
- **Example:** The development of educational infrastructures and the deployment of teachers and trainers worldwide to ensure access to education in the most vulnerable regions.
- **What makes this future joyful:** A civilizational shift: education rather than war.
- **Paradox / Risk:** Education and access to information remain largely influenced by the most powerful countries, which may steer content and priorities according to their own agendas.



Step 3 - Entanglement: Evolution of Scenarios Through an External Intention

The initial scenarios were subjected to an entanglement with the collective intention of another team, randomly drawn: **"Develop solutions enabling elderly people to remain aligned with technological developments."**

This entanglement expanded **the original intention:**



2

To enable everyone to access education and technology in a simple and equitable way — by integrating issues related to aging, intergenerational connections, and the risk of age-related digital divides.

Scenario 1 after entanglement: Cognitive chips for babies and seniors

- **New tension:** Introducing a universal educational foundation through cognitive implants creates an unexpected risk: a new generational divide. While children benefit from equal access to fundamental knowledge, older adults risk being progressively excluded from an increasingly fast-paced technological world.
- **Impact on the scenario:** Educational equality can no longer be limited to childhood. It must extend across the entire life cycle, integrating issues of aging and cognitive autonomy for seniors.
- **Evolution of the scenario:** Two types of chips coexist:
 - one implanted at birth to guarantee a shared foundation of fundamental knowledge,
 - the other exclusively intended for people over seventy, available upon official request, enabling them to remain aligned with technological developments.
- **New paradox / ethical question:** These chips can be deactivated or paused at any time by their users. Such deactivation results in reduced cognitive efficiency but preserves a form of freedom. Does equality require permanent augmentation, or the freedom to disengage from it?

Scenario 2 after entanglement: Intergenerational school-cities

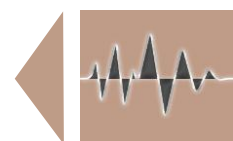
- **New tension:** The pursuit of egalitarian education, initially designed for children, collides with a major demographic transformation: a drastic decline in birth rates and accelerated population aging.
- **Impact on the scenario:** School-cities, originally conceived as uniform and collective educational spaces for younger generations, now have unused capacity. They become potential spaces for intergenerational transmission.

- **Evolution of the scenario:** School-cities open to elderly people who wish to join. Seniors enter the Citadels of Equality as learners or contributors. They participate in daily life, share their experience, and take part in educational projects, fostering continuous exchanges between generations. These spaces gradually evolve into intergenerational living environments combining learning, transmission, and coexistence.
- **New paradox / ethical question:** While this coexistence strengthens social bonds and reduces isolation among older adults, it raises sensitive questions: how far can collective life be organized without restricting free choice, individual autonomy, and traditional family relationships?

Scenario 3 after entanglement: World organization for the disadvantaged and the elderly

- **New tension:** In a world where technologies evolve at an ever-accelerating pace, the risk of digital exclusion among older adults becomes a major social issue, likely to create a lasting generational divide.
- **Impact on the scenario:** Education can no longer be conceived as limited to childhood or youth. It becomes a lifelong learning process, explicitly including seniors.
- **Evolution of the scenario:** The World Organization dedicated to education and information funds mandatory courses for older adults. These training programs focus on the use of digital tools, the understanding of automated systems, and artificial intelligence. These courses are accessible to all, regardless of initial skill level, and aim to maintain autonomy and the ability to interact with everyday technological systems.
- **New paradox / ethical question:** The mandatory nature of these courses raises questions about the boundary between necessary support and enforced adaptation to an imposed technological world. Can exclusion be reduced without restricting individual freedom?

Step 4 - Decoherence - Stabilization of a scenario in response to a constraint



Team 1 chose to draw a surprise card, introducing a major disruption to the imagined scenarios: **"The discovery of a highly advanced intra-terrestrial civilization living beneath the Earth's surface."**

Contrary to commonly imagined fear-based scenarios, the intention of the intra-terrestrials is not conquest, but dialogue. Faced with this historic encounter, humanity responds with prudence and lucidity. Nations decide to unite their forces to send the most brilliant minds on the planet — researchers, scientists, philosophers, and recognized thinkers. Their mission is to establish a peaceful exchange, to understand the culture and worldview of this unknown civilization, and to share in return what humanity has to offer that is most valuable.

The first encounters take place in a climate of mutual respect and curiosity. The intra-terrestrials bring profound knowledge about energy, biology, and the structure of matter, while humans share their creativity, cultural diversity, and imaginative capacity.

This revelation compelled the team to confront its assumptions with reality and to stabilize a scenario by integrating educational, generational, and civilizational issues: **Scenario 1 after entanglement.**

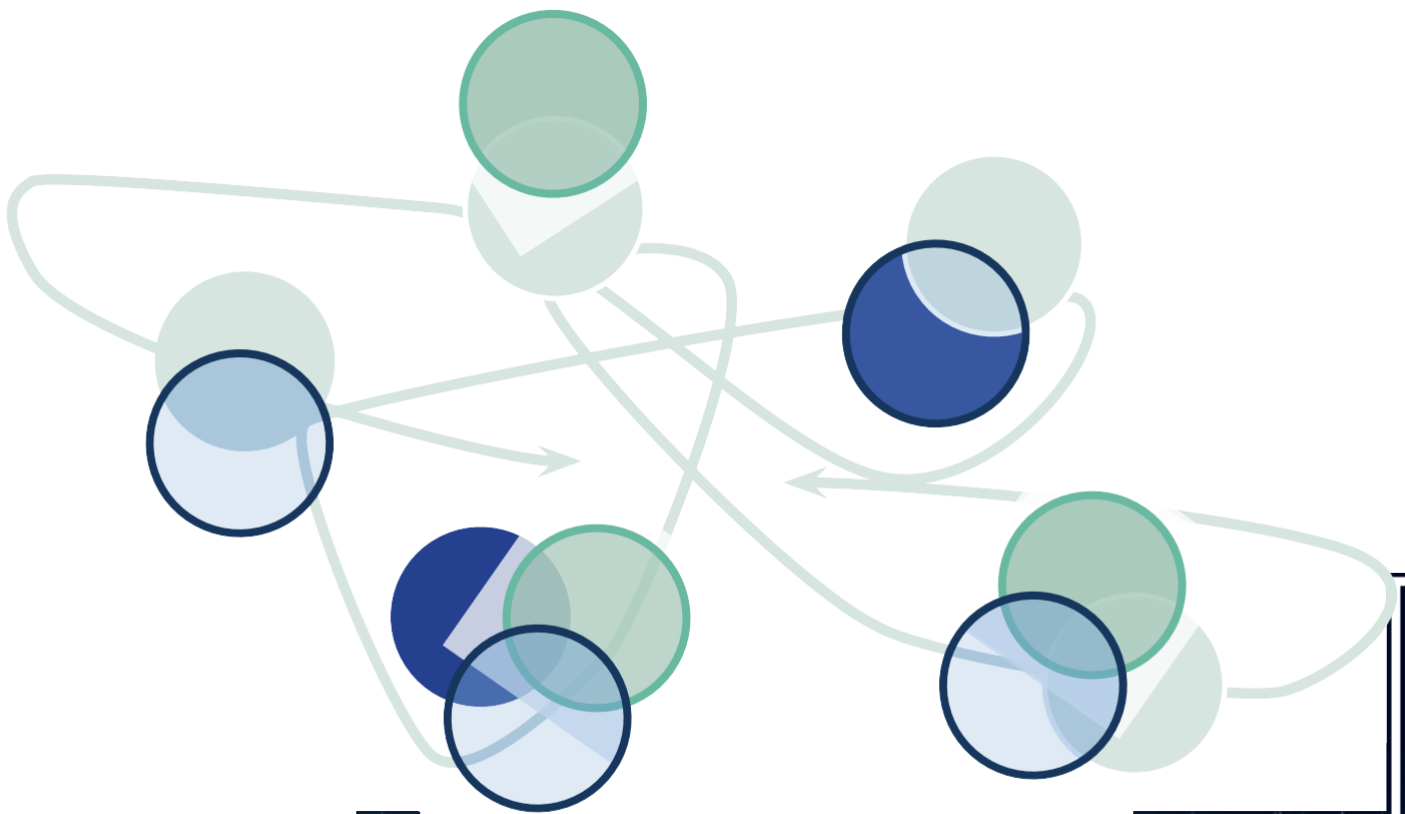
Final Scenario: Cognitive chips for babies and seniors

By 2050, a universal educational foundation is guaranteed through cognitive microprocessors implanted at birth, strictly limited to fundamental knowledge. The objective is to provide everyone with the same educational starting point.

This equalization nonetheless reveals a generational divide, addressed through a second chip designed for seniors, enabling them to remain active agents in a rapidly evolving digital world. Technology is deliberately bounded: it does not indefinitely enhance human capacities; it supports autonomy.

The encounter with an intra-terrestrial civilization confirms this orientation: it opens the path toward a shared evolution made possible by cognitive microprocessors, where progress is no longer a privilege but a tool for understanding and exchange among different forms of humanity.

CONVERGENCES ACROSS THE 5 GROUPS



After the stabilization of the final scenarios (decoherence), a collective comparison made it possible to identify the main synchronicities across the teams.

1. RESONANCES OF COLLECTIVE INTENTIONS

Despite the diversity of intentions formulated by the teams, the collective synthesis revealed that none of them can be understood as a self-sufficient axis. Without prior coordination, the groups formulated proposals that respond to one another, complement each other, and shed light on each other. This synchronicity makes visible a network of shared concerns in which education, social bonds, care, ecology, and economic justice are inseparable.

From this collective resonance, three major lines of force emerge:

- Justice and equality of access,
- Repairing social bonds and addressing vulnerabilities,
- Responsibility toward the living world and the search for meaning.

A. Justice, equality and access

These intentions converge toward the will to reduce structural inequalities and to offer everyone the same capacity to act in the world to come.

- Enable everyone to access education and technology in a simple and equitable way.
- Change the capitalist system to build a more socially and ecologically just world.

Progress only makes sense if it is equitable, whether it operates through education, technology, or a deeper transformation of economic models.

B. Human bonds, care, and vulnerabilities

These intentions place human relationships and the consideration of fragility at the heart of future transformations.

- Contribute to ending human loneliness.
- Develop technologies capable of supporting elderly people and vulnerable individuals in matters of health.

Technology is envisioned as a tool that supports human connection, not as a factor of isolation or a substitute for human relationships.

A. Relationship to the living world and meaning

This intention questions humanity's overall relationship with its environment and runs through all other issues.

- Make humans more attuned to their environment, both in their relationships and in their relationship with nature.

Any sustainable transformation requires a **reconciliation with the living world**, which conditions technological, economic, and social choices alike.



1- Cross-reading of intention

Group	Intention	Resonating Intention	Insights revealed by synchronicity
Team 1 (T1)	Enable everyone to access education and technology in a simple and equitable way	T3, T4, T5	Equality of access does not concern knowledge alone, but also the ability to remain an active participant (older adults), to understand one's environment, and not to be subjected to an exclusionary economic system.
Team 2 (T2)	Contribute to ending human loneliness	T3, T4	The fight against isolation involves care, attention to vulnerabilities, and a different quality of relationship with others and with the living world
Team 3 (T3)	Develop technologies capable of supporting older adults and health-vulnerable individuals	T1, T2	Technology is conceived as a lever for inclusion: it extends access to education and contributes to the fight against loneliness.
Team 4 (T4)	Enable humans to become more attentive to their environment, in their relationships and in their relationship to nature	T1, T2, T5	The relationship with the living world permeates educational, social, and economic choices alike. It provides an ethical framework for the proposed transformations.
Team 5 (T5)	Transform the capitalist system to build a more socially and ecologically just world	T1, T4	Economic transformation is inseparable from equality of access and from a renewed relationship with the living world.

2. SCHEMATIC READING OF THE FINAL SCENARIOS

Despite very different universes (AI, energy, the living world, post-capitalism, non-local communication), the final scenarios converge around the same structuring choices:

What appears in almost all scenarios:

- deliberately limited, bounded, or regulated technology,
- the primacy of human relationships over technical performance,
- collective or ethical governance (never purely market-driven),
- a reconciliation with the living world or with human vulnerabilities,
- a shared distrust of the logic of total optimization.

In other words, the teams do not choose “more technology,” but a different way of situating it within society.

2- Convergences Across the Final Scenarios

Group	Final scenario	Central choice	Resonances between scenarios
Team 1	Cognitive chips for infants and seniors	Educational equality and generational inclusion; bounded technology	↔ T2 (intergenerational connection), ↔ T3 (regulated care), ↔ T5 (non-market-driven progress)
Team 2	Frictionless intergenerational connections	Technology in the service of empathy; ethics of consent	↔ T1 (inclusion), ↔ T3 (care), ↔ T5 (primacy of human connection)
Team 3	Predictive care under collective governance	Energy abundance combined with democratic control	↔ T2 (rejection of surveillance), ↔ T5 (collective ownership), ↔ T1 (individual autonomy)
Team 4	Reconnection with the living world	Voluntary limitation of digital technologies; direct experience of the living world	↔ T5 (cooperation with ecosystems), ↔ T1 (shared education), ↔ T2 (technological sobriety)
Team 5	Nova DODO – a post-capitalist sustainable city	Exit from market-driven logic; self-governance and care for the living	All groups: social connection, sobriety, collective governance, choosing limitations as a condition for progress

From the interpretation of the final scenarios as a set of emerging resonances, four major convergences begin to appear.

1. Limited, Chosen Technology — Never All-Powerful

- Bounded cognitive implants (Team 1),
- Time-restricted AI / regulated communication (Team 2),
- Digital technologies reduced to strict necessity (Team 4),
- Predictive healthcare under collective control (Team 3).

Progress arises through voluntary limitation, not through infinite augmentation.

2. Human connection as the central measure of progress

- Combating loneliness (Team 2),
- Inclusion of older adults (Team 1, Team 3),
- Self-governance and cooperation (Team 5),
- Shared education through lived experience (Team 4).

Progress is assessed through the quality of relationships, not through performance.

3. Governance as a condition for trust

- Cooperative and public institutions (Team 3),
- Post-capitalist self-governance (Team 5),
- Ethics of consent (Team 2),
- Shared educational frameworks (Team 1, Team 4).

Technology is considered acceptable only if it is collectively governed.

4. Reconciliation with the living world as a shared horizon

- The re-emergence of extinct species (Team 5),
- Ecological civic service (Team 4),
- Limitation of digital uses (Team 4, Team 2),
- Departure from extractive logics (Team 5).

The living world is no longer a mere backdrop, but a structuring principle of future societies.



«SYNCHRONICITY OF THE FINAL SCENARIOS

Examining the final scenarios side by side reveals strong synchronicities, beyond the diversity of futures imagined. All groups, without prior coordination, converged toward a shared vision: progress can no longer be conceived as an accumulation of technological capabilities, but rather as a qualitative transformation of human, social, and ecological relationships.

The technologies retained are systematically bounded, regulated, or collectively governed. They do not aim at permanent optimization, but at supporting autonomy, inclusion, and human connection. Whether in education, healthcare, communication, or social organization, technology is never an end.

A second strong resonance concerns the primacy of human connection. The fight against loneliness, attention to vulnerabilities, intergenerational cooperation, and collective participation emerge as central criteria for a desirable future.

Finally, all scenarios situate progress within a renewed relationship with the living world. The teams envision societies capable of welcoming the unpredictable, respecting ecological limits, and cooperating with ecosystems rather than exploiting them.

These synchronicities outline a shared horizon: a world in which collective achievement is measured less by growth or performance than by the sustained capacity to connect, include, and care.

POSTFACE - A SHARED COMPASS



This white paper was not intended to produce a single vision of the future, nor to elevate one scenario into a definitive model. On the contrary, it sought to open a space for reflection in which multiple possible futures could emerge, confront one another, transform, and eventually enter into resonance.

As the work progressed, one observation gradually became impossible to ignore. Despite the diversity of initial intentions, the disruptions encountered, and the trade-offs made by each group, certain underlying patterns ran across all scenarios. Without prior coordination, the teams converged toward shared concerns, revealing a common understanding of the conditions required for a future perceived as desirable, sustainable, and humanly viable.

This convergence does not outline a single future. Rather, it reveals a broader structure: a form of collective hologram in which each scenario reflects a fragment of a larger whole. Taken individually, each group accesses only part of the landscape. But when the scenarios are placed in relation to one another, recurring patterns, shared tensions, and deeper structures of meaning progressively become visible.

The concept of a collective hologram draws inspiration from several complementary frameworks, including complexity theory, collective sensemaking, and contemporary interpretations of quantum mechanics. Without claiming a direct correspondence between physical and social phenomena, it is based on a simple intuition: when multiple possible futures are explored independently by different groups, certain patterns and coherences only become visible when the resulting scenarios are observed as a whole.

As Hervé Zwirn suggests in his reflections on the role of the observer and the coexistence of possibilities, a shared reality often emerges through the integration of multiple perspectives [9]. In a similar vein, Edgar Morin argues that interactions between parts can generate emergent properties that cannot be reduced to any single element taken in isolation [8], while Karl Weick highlights how meaning is collectively constructed in situations of uncertainty [11].

From this perspective, the collective hologram should be understood not as a theory, but as an observational framework that helps reveal the imaginaries, values and aspirations emerging through the exploration of multiple possible futures.

This perspective can also be understood as a form of **constellation of meaning**. Much like a constellation becomes visible when individual stars are observed together, the collective hologram is not contained within any single scenario. Rather, it emerges from the relationships between narratives, choices, and representations that, when considered

in isolation, do not reveal the broader structure. Through the collective observation of these contributions, recurring patterns, tensions, shared values, and common imaginaries become visible. This cartography does not describe a predetermined future; instead, it reveals the underlying structures of meaning that connect present realities, possible futures, and the ways in which people make sense of the world.

The synthesis that follows therefore seeks neither to merge the scenarios nor to rank them. Instead, it offers a transversal reading of the resonances observed across the work of the five groups. A cartography of collective imaginaries from which emerges the outline of a world where technology, social organization, and the relationship with living systems no longer ends in themselves, but means placed in the service of connection, autonomy, and collective responsibility.

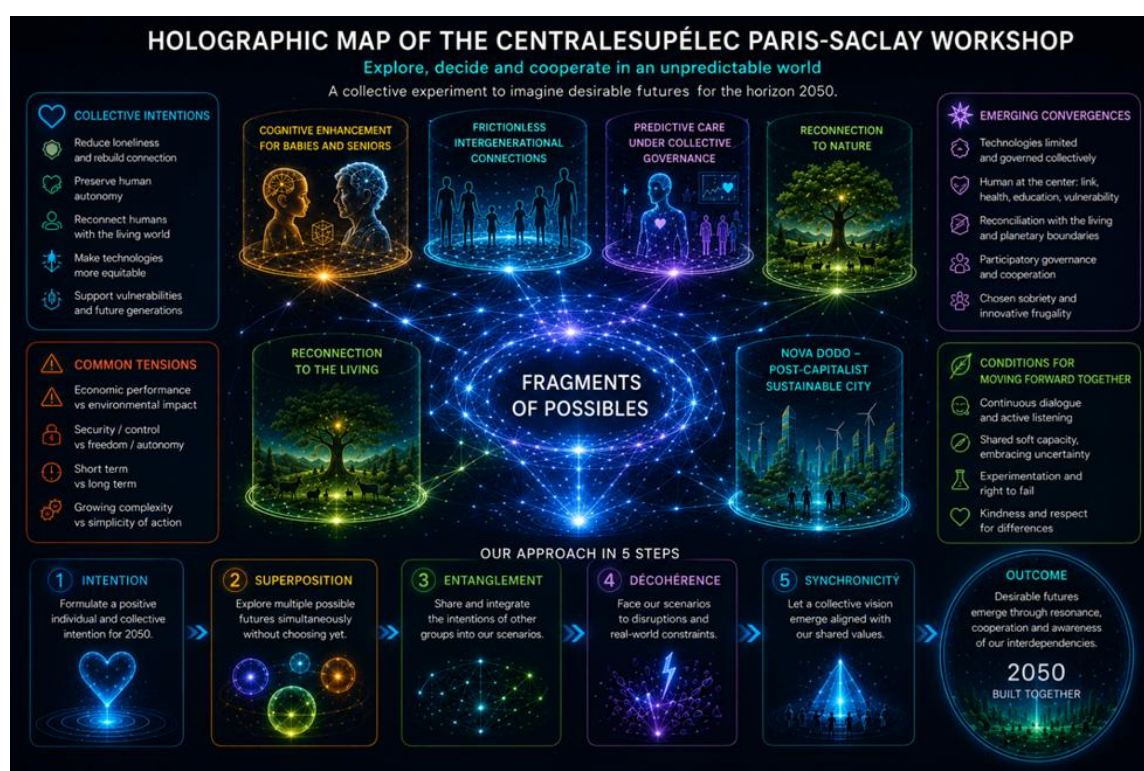
Among the strongest resonances emerging from this collective hologram, a common structure gradually begins to appear that of a society in which the quality of human connection becomes the primary condition for collective viability.

The Society of Connection

By 2050, humanity has come to understand that survival depends not only on innovation, but on maturity: the capacity to cooperate, to protect the living world, and to govern its tools.

- A bounded cognitive implant, introduced at birth, ensures genuine equality from the outset. Access to fundamental knowledge is no longer left to individual trajectories or social inheritance but is considered a common good (Team 1).
- Social cohesion becomes a priority objective. Intergenerational mechanisms and empathy-based technologies are deployed to support connection, reduce isolation, and enable everyone to remain a full participant in society, regardless of age or vulnerability (Team 2, Team 3).
- The relationship to the living world becomes a foundational form of learning. A dedicated civic service confronts citizens with ecosystems, land, and planetary limits, anchoring individual choices within an assumed collective responsibility (Team 4).
- Certain territories experiment with new forms of organization based on contribution,

self-governance, and prevention, where the pursuit of cohesion and sustainability takes precedence over accumulation and individual performance (Team 5). Finally, in the face of otherness — whether unknown civilizations or re-emerging forms of life—humanity abandons a logic of domination. It accepts limiting its margins of action in order to become a co-inhabitant of a shared world, within a negotiated rather than imposed balance.



A common Compass

What the scenarios reveal is not a quest for maximal individual freedom, but a deliberate trade-off: equal opportunity, social cohesion, and the capacity to form a society to take precedence over the unlimited expansion of individual freedoms. Freedom does not disappear; it simply ceases to be the primary principle.

Several scenarios also suggest a gradual move beyond economic logic based on scarcity and accumulation, toward models centered on contribution, cooperation, and care for the living world—without framing this evolution as an ideological endpoint.

In all cases, these scenarios remind us of one essential insight: a viable future is built less through power than through the quality of connection.



APPLICATIONS FOR ORGANIZATIONS

Although the insights presented in this synthesis are derived from an experiment conducted with students at CentraleSupélec Paris-Saclay, the approach has also been tested in several professional settings. Depending on the objectives pursued, it can be used to explore possible futures, support collective reflection, strengthen collaboration among stakeholders, or facilitate decision-making in complex and uncertain environments.

Strategic Foresight

The workshop enables organizations to explore multiple possible futures without attempting to predict the future. By confronting different hypotheses, participants develop their capacity to anticipate technological, economic, societal, and environmental transformations that may affect their activities. Beyond the production of scenarios, the approach helps uncover the representations, assumptions, and collective imaginaries that already influence decisions in the present.

Collective Decision-Making Under Uncertainty

Organizations regularly face situations in which information is incomplete, priorities are conflicting, and consequences are difficult to anticipate. The methodology allows participants to experience such situations firsthand. Teams are required to formulate intentions, integrate unexpected constraints, arbitrate between competing options, and collectively commit to a final choice. This experiential process fosters the development of essential capabilities for decision-making in complex and evolving environments.

Supporting Organizational Transformation

Transformation initiatives often bring together stakeholders who hold different visions of the future. The entanglement phase encourages these perspectives to interact, revealing underlying tensions and enabling the exploration of shared trajectories. The approach helps build a collective understanding of future challenges and strengthens engagement with transformation efforts.

Leadership Development

The workshop provides leaders and managers with an experiential environment in which they can develop several key dimensions of leadership:

- listening to diverse perspectives;
- balancing competing interests;
- navigating uncertainty;
- building a shared vision;

- making decisions in the absence of certainty.

It encourages a leadership posture grounded in listening, adaptability, and cooperation.

Innovation and Emerging Risks

Exploring multiple futures helps reveal not only opportunities but also risks that often remain invisible within traditional planning processes. Participants are encouraged to identify the unintended consequences of innovation, the systemic effects of their choices, and the ethical tensions that may accompany future transformations.

Stakeholder Alignment

Organizations bring together stakeholders with different interests, constraints, and worldviews. The collective construction of scenarios provides a framework for making these differences explicit while identifying areas of convergence. The exercise fosters the emergence of a common language and a shared understanding of key challenges.

Exploring Organizational Imaginaries

One of the distinctive contributions of the approach lies in the analysis of scenarios not only individually but also collectively. This cross-analysis makes it possible to identify the collective imaginaries, values, recurring tensions, and worldviews that shape participants' choices. The resulting hologram does not describe a predetermined future. Rather, it provides a map of the collective representations that influence present decisions and orient future transformations.

Understanding the Present Through the Exploration of Futures

Unlike foresight approaches primarily focused on anticipating external developments, this methodology uses the exploration of multiple futures to reveal the collective dynamics, value systems, and imaginaries that already shape the decisions of a group or organization. The future thus becomes a tool for understanding the present, fostering collective dialogue, and learning how to make decisions in an uncertain world.



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