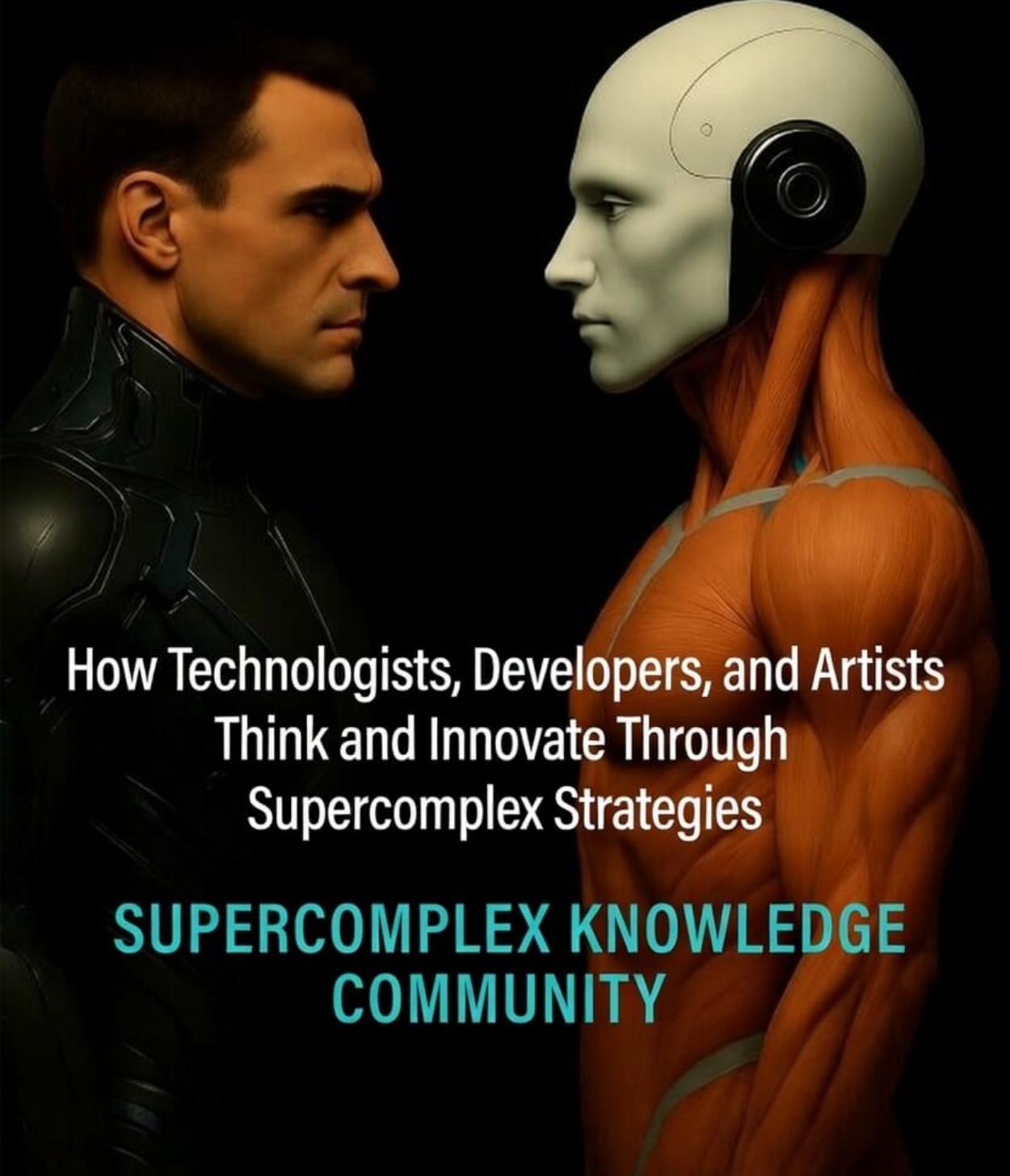


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TECHNOBRAIN



How Technologists, Developers, and Artists
Think and Innovate Through
Supercomplex Strategies

**SUPERCOMPLEX KNOWLEDGE
COMMUNITY**

Book Title: Technobrain. How Technologists, Developers, and Artists Think and Innovate Through Supercomplex Strategies

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Supercomplex Knowledge (SK) is the new philosophical, scientific, and technological paradigm that both unifies and transcends classical approaches to complexity. It integrates theory, technology, and praxis to describe, model, and transform systems at all levels. We are the creators of the concept of **Supercomplexity** as the dynamic overlap of macrosystems—microparticulate, macroscopic, and biological—whose interactions generate emergent patterns and unpredictable reorganizations. From the development of **COMPLEX CUORE**, our simulation tool based on **Adaptive Dynamic Maps (ADM)**, to our training programs, consulting services, and international scalability, SK leads epistemic innovation in a world where complexity is not the exception but the structural condition of reality.

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ENTRY

The Emergence of the Technobrain

We are living through an unprecedented transformation. The systems we inhabit and design no longer respond to simple logics or isolated causes. Technologies, far from being neutral tools, have become extensions of our minds, prostheses of our decisions, accelerators of human evolution. And with this, a new subject has emerged: the *technobrain*, which is, in fact, an expanding network. It does not obey; it reconfigures itself. It is not addressed by old structures but overflows them with algorithmic flows, decentralized connections, and distributed agency. Its power does not lie in resisting control, but in being elusive: a system that learns, mutates, and transcends the limits of the human while simultaneously redefining them.

This book is an invitation to technologists, engineers, developers, creatives, artists, and innovators to inhabit a new paradigm. A paradigm where intelligence is not measured by processing speed or by the accumulation of data, but by the ability to anticipate, intervene, and co-evolve with living, complex, and ever-changing systems. All *Supercomplex Knowledge* is structured in a relational, imbricated, stochastic manner, circulating alongside data and evidence. The enjoyment of this experience is absolute. The technobrain finds pleasure in discovering behaviors across all macrosystems and their respective overlaps, in mapping hidden connections, in solving multiscale challenges, in anticipating bifurcations, and in modeling complexity and supercomplexity. What once was effort is now play—with structures, flows, and temporalities.¹

¹ We believe that reading the book “*Supercomplex Knowledge. The New Emerging Paradigm for Exploring the Complexity of the Universe, Life, and the Human Brain*” (Kindle, 2025) would be of great help to deepen this text. This work presents the foundation of a new epistemological and ontological paradigm that creates and articulates the concept of Supercomplexity as a higher way of understanding, modeling, and intervening in complex systems. It is a comprehensive and transformative view of the complexity of the universe, life, and the mind. Faced with the limitations of the Sciences of Complexity and Complex Thought, Supercomplex Knowledge (SK) unifies and surpasses both currents with a transdisciplinary, operational, and evolutionary proposal. It introduces a new conception of science, based on multiscale complex constructivism, an unprecedented and exhaustive taxonomy of complex systems, and a logic of description and intervention founded on the triad: Energy Flows, Structural Morphology, and Temporal Connectivity. These are the pillars of the paradigm. It also presents the most exhaustive view of contemporary systemic Complexity, integrating the dynamics of stability, synchronous emergence, and escalated

The most advanced technological creation no longer simply requires more data or better algorithms. It requires maps. Maps that reveal how energy flows, how forms mutate, and how temporalities interweave. Maps that represent the oscillating vitality of the system. Maps for minds that not only calculate, but also understand.

We must abandon the old linear molds, designed to solve problems under a cause-and-effect logic. The world no longer works that way. Today, systems intertwine, feed back, reorganize, overlap, and evolve on multiple scales. This is the reality that Supercomplex Knowledge (SK) seeks to describe, anticipate, and transform. It is about moving from intuitive action to conscious and responsible intervention on global systems.

And to achieve this, it needs allies: *technobrain*s aware of the complexity they inhabit and generate, capable of thinking beyond statistics, linearity, or functional efficiency. This book proposes to expand the mental frameworks from which platforms, algorithms, devices, and experiences are created. Because the world we face can no longer be modeled solely through differential equations or neural networks that adjust weights by repetition. What we need is a new cognitive architecture.

It is not only about recognizing that the reductionist paradigm is reaching its limits, but about inhabiting the emergence of new cognitive and technological functions. AI, for example, can no longer be confined to statistical prediction or pattern optimization: it must evolve toward combinatorial architectures, capable of articulating heterogeneous energy flows, modeling morphologies in mutation, and synchronizing diverse temporalities. Data fusion—as the intersection of multiple records, scales, and sensors—becomes here an unequivocal sign of supercomplexity: a leap from isolated calculation to the orchestration of interdependent systems. Thus, the Technobrain not only uses technologies but redefines them from a framework able to

emergence. It does so through the simultaneous analysis of the three great macrosystems that shape our universe: the microparticles, the macroscopic, and the biological, as well as their overlap.

anticipate bifurcations, intervene at multiple levels, and expand the intelligibility of reality.

The Five Types of Brain According to Supercomplex Knowledge

Supercomplex Knowledge (SK) proposes a classification of five types of brain, understood as modes of neurocognitive, relational, symbolic, and operational organization. Each one shapes a distinct way of interpreting, acting upon, and intervening in the world:

1. Reactive Brain

Responds to immediate stimuli, regulated by fear or desire. Its logic is binary: flight or fight. It lives trapped in immediacy, without planning or abstraction. This mode is not exclusive to humans; it also appears in higher mammals, certain birds, mollusks, and other organisms with complex nervous systems. Its essential characteristic is that it operates independently of social networks, narratives, or symbolic learning: it responds directly to genetic mechanisms aimed at immediate survival. The **reactive brain** is activated by stimuli related to vital needs such as eating, protecting oneself from cold or heat, escaping danger, or seeking shelter. It does not plan, interpret, or narrate—it responds. Its logic is that of urgency, of immediate activation in response to signals that threaten the organism's integrity.

2. Tribal Brain

Operates through rigid group identifications, idealizations, and unquestionable loyalties. It thinks in terms of “us versus them,” and its morality is identity-based. It is highly manipulable and incorporates a basic relational awareness: the subject recognizes their belonging to a group and begins to experience their identity as interdependent with that collective structure. However, this opening does not yet imply a systemic or supercomplex understanding. On the contrary, the **tribal brain** limits its connectivity to the boundaries of the group. Everything outside the tribe is foreign, suspicious, inferior, or an enemy. Its need to please also makes it highly manipulable by the authorities and systems that dominate culture and everyday life.

3. Pathophilic Brain

The pathophilic brain constitutes a mode of cognitive organization in which the validation of knowledge, behavior, and identity is structured around the figure of an external authority, which can be embodied by tradition, law, religious dogma, a teacher, a political leader, or any institutionalized source of symbolic power. Its logic is not simply tribal—because it does not primarily seek horizontal cohesion within the group—but rather vertical, oriented toward obedience, confirmation, and the reproduction of the established order. This mode of functioning is deeply conservative, not merely in an ideological sense, but epistemologically: it avoids dissent, penalizes innovation, and celebrates repetition as a guarantee of security. The pathophilic subject finds relief in delegating their autonomy and finds meaning in continuity with what is inherited. Their temporal connectivity is linear and retrospective: looking toward origins, foundations, and revealed truth.

These three types constitute the *pre-complex*. They are defensive structures, effective for survival, but dysfunctional in uncertain, ambiguous, and evolving environments.

4. Complex Brain

The complex brain marks a key turning point in the evolution of thought: it enables moving beyond linear, dichotomous, or dogmatic frameworks by integrating multiple variables, dimensions, and perspectives. It operates with a systemic logic that recognizes the existence of feedback loops, side effects, interdependencies, uncertainty, and emergence. It does not seek absolute certainties or closed hierarchies, but provisional maps, dynamic models, and networks of relationships. It employs analytical tools drawn from contemporary science: systems theory, simulations, multivariable modeling, and algorithms.

5. Supercomplex Brain

The supercomplex brain not only models systems but also recognizes itself as an intervening system within other systems. It

is creative, reorganizing, and transdisciplinary. Its thinking is both ethical and aesthetic at the same time. It integrates the symbolic, the affective, the corporeal, the narrative, the technical, and the spiritual. It does not fragment or separate but weaves. It assumes that every intervention is a form of reciprocal transformation: to understand is always also to transform, and to transform requires inhabiting what one seeks to change. This mode of functioning—the rarest and least common—constitutes the platform from which the Technobrain can emerge: a mode of thought that combines analytical capacity, aesthetic sensitivity, strategic vision, and relational awareness to create transformative technologies.

Within this framework, the vast majority of technologists, engineers, and developers operate—sometimes unknowingly—between the *complex brain* (4) and the emerging *supercomplex brain* (5). They program, model, simulate... but do not always stop to reflect on the epistemic framework they are operating from, nor on the future they are helping to shape. This book is an invitation to take that step: the re-education of the *technobrain* toward *Supercomplexity*.

We now present two concrete examples:

- **Complex Brain:**

A team of engineers designs an intelligent transportation network that adapts to real-time traffic using sensors, AI, and historical data. The system is efficient, flexible, and predictive. But it does not consider the emotional impact on passengers, their changing needs, or the social effects of automation. It is intelligent, but not wise.

- **Supercomplex Brain:**

A community of technologists, urban planners, and artists creates a participatory platform where citizens co-design the use of public space. The network adjusts energy flows, proposes creative uses of the environment, and modifies its structure based on social, aesthetic, and emotional variables. The system learns with the

community, reconfigures its forms, and promotes relational well-being. It does not merely respond to complexity—it cultivates it.

Throughout history, certain minds have reeducated themselves to operate within this supercomplex mode. They have cultivated a transdisciplinary, visionary way of thinking, marked by a unique combination of creativity, rationality, and ethics. Among them:

- **Archimedes:** Engineer, physicist, and mathematician. He understood hydraulic and leverage principles that transformed both engineering and physics. Capable of linking empirical observation with mathematical abstraction.
- **Vitruvius:** Roman architect and engineer. Proposed the triad *firmitas*, *utilitas*, and *venustas*, a precursor to the supercomplex conception of integration between form, function, and beauty.
- **Leonardo da Vinci:** Artist, inventor, anatomist. The ideal model of a supercomplex technologist due to his multiscalar thinking, systemic vision of the human body and nature, and anticipatory design capacity.
- **Ada Lovelace**, who understood that calculation could generate aesthetic forms, not just numerical solutions.
- **Nikola Tesla:** Visionary of energetic flows. Understood—like few others—the circulation, storage, and transmission of energy. Confronted power structures with free thinking and disruptive solutions.
- **Alan Turing**, who not only laid the foundation for modern computing, but also imagined sentient machines before they existed.
- **John von Neumann:** Architect of the modern computer, pioneer of cybernetic thinking. Connected mathematics, biology, economics, and systems theory.
- **Shuji Nakamura:** Inventor of the blue LED, a revolution that enabled efficient white lighting. Redefined energy use on a planetary scale.

They were not merely geniuses. They were brains that learned to combine the incommensurable. And that is what this book proposes for today's technologist: not to accumulate more data, but to transform their way of thinking.

Three Hypotheses for the Technobrain Era

This book is grounded in three foundational hypotheses that entirely reconfigure contemporary technological practice:

1. Access to the supercomplex brain is possible—and necessary—for technologists.

The most powerful technological creation requires more than logical-mathematical intelligence or programming skills. It requires a reorganizing mind, capable of working with metaphors, visualizing morphologies in mutation, and understanding flows in real time. The technologist who trains in this way of thinking gains access to a multiscalar, integrated, and creative mental architecture. It is the supercomplex brain in action.

2. Collaboration is the new evolutionary infrastructure.

The cognitive and emotional power of the supercomplex brain does not unfold in isolation or Darwinian competition. It is activated only in environments where cooperation replaces control, complementarity overcomes ego, and collective intelligence becomes a constructive force. The most resilient, beautiful, and adaptive systems emerge from alliances between diverse brains that listen, interconnect, and transform one another.

3. The ultimate purpose of technology must be the care of living systems.

Any innovation that does not contribute to the survival, regeneration, and well-being of living systems—from cells to communities—ultimately becomes dysfunctional or destructive. *Technobrain* proposes an ethics of development: a technology oriented not toward domination or accumulation, but toward co-evolution between the biological, the symbolic, and the

artificial. Designing technology will then mean designing life that cares for life.

The Supercomplex Framework

Supercomplex Knowledge (SK) proposes a paradigm shift. It asserts that every complex system—whether physical, chemical, biological, technological, social, or symbolic—can be described, modeled, and intervened upon through the interaction of three fundamental dimensions:

- **Energy Flows (EF):** what circulates, how, and with what intensity.
- **Structural Morphology (SM):** how the system is organized, what form it takes.
- **Temporal Connectivity (TC):** what rhythms, durations, synchronies or asynchronies shape its interactions.

These are not poetic metaphors. They are measurable, observable, and—most importantly—transformable categories. But only if we have models capable of simulating their interactions in real time.

Example: An intelligent city should not adjust itself solely based on energy consumption statistics. It should model, in real time, how energy flows, how infrastructure reorganizes itself, and how human, physical, and digital networks connect or disconnect.

- **EF** tracks consumption and redistribution patterns based on climate, schedules, and crises.
- **SM** draws a dynamic map, where stations or neighborhoods “grow” or “mutate” structurally.
- **TC** makes it possible to anticipate cascading effects: a concert, a blackout, a pandemic, or a wave of remote work.

This system does more than predict. It reorganizes its systemic architecture. It becomes resilient, adaptive, creative. For a technologist, this represents an unprecedented opportunity: to move from operating with data to designing organisms. To create evolving systems, whose nodes change in size, color, shape, interaction, energy, or duration.

The artificial intelligence of the future will not be merely predictive. It will be combinatorial, adaptive, and reorganizing. And if we do not incorporate this *supercomplex* approach, we will remain trapped in obsolete systems in the face of global crises such as ecological collapse, informational inequality, or cognitive alienation. Some steps already exist: dynamic network simulators, algorithms for uncertain environments, programming for living systems, multiscale 3D visualization. But something essential is still missing: an integrative theoretical framework.

A First Definition of Technobrain

The *Technobrain* is the brain configuration that emerges in technologists, engineers, developers, innovators, and artists when, in the technological creation process, they transcend pre-complexity and begin to operate from a strategic combination of the five brains: reactive, tribal, pathophilic, complex, and supercomplex.

This configuration is neither static nor universal. It only activates when the subject, while designing, programming, assembling, or representing, does so with a multiscale, dynamic, and relational awareness of the complex systems involved.

The *Technobrain* manifests especially in the production of maps and technological objects capable of simultaneously intervening in energy flows, structural morphologies that enable or hinder transformations, and temporal connectivities that govern the duration, sequence, or synchrony of processes.

For this reason, the *Technobrain* is neither an organ, nor an evolutionary stage, nor a mere technical skill. It is an operational state of the subject who creates technology from *Supercomplex Knowledge*: a cognitive disposition that combines brain levels, projective skills, and ethical-aesthetic criteria, producing artifacts, visualizations, narratives, or systems that express a lucid intervention on reality. Only from this configuration do technological maps and products transcend mere functionality and become expressions of relational, combinatorial, and transformative intelligence.

The first challenge of the *Technobrain* is to reach—even if only for a brief moment—the *Technobrain experience*: a singular state in which thought, imagination, and strategy converge in the design of a map of complex relationships or in the construction of a technological object with systemic intention. It is not simply about producing something useful, but about activating a mode of expanded cognition that integrates energy flows, dynamic structures, and interconnected temporalities.

The second challenge—more difficult still—is to incorporate the *Technobrain* as part of our habitual cognitive repertoire; that is, to ensure that this way of thinking and acting is no longer an extraordinary event or an isolated epiphany, but a mode that is accessible, callable, within reach of our daily decisions. It is about transforming the exceptional experience into an active competence: moving from having lived it to being able to summon it, modulate it, inhabit it with fluency.

This book is structured as a path of transformation. Each reader—whether technologist, artist, educator, hacker, or engineer—will embark on a journey: from bewilderment in a hyperconnected world to mastery of tools and perspectives that enable creation within complexity. Because this transformation is not individual. It is collective, ethical, aesthetic, and political. And it is urgent.

States, universities, institutions, and communities are called to a foundational decision: to incorporate principles that enhance systemic well-being. There is no possible future without an intelligence commensurate with the complexity we inhabit. This is an invitation not only to read but to imagine what has yet to be named. To design software, networks, artificial intelligences, immersive hardware, symbiotic artifacts, or communion technologies. Not to reproduce the known, but to co-create what has yet to be spoken. The technology of the future already is—and will increasingly be—*supercomplex*. And those who design it must be so as well. Welcome to the era of the *technobrain*, the *Technobrain*.

CHAPTER 1. WE ARE WHERE WE ARE... BUT WHERE ARE WE GOING?

Humanity should be better off. What went wrong along the way? We live in an era of astonishing achievements. We can program artificial intelligence that fluently imitates human language, manipulate genes with surgical precision, 3D print organs, construct buildings in a matter of days, and design algorithms capable of predicting our decisions with unsettling accuracy. And yet, millions of people continue to die of hunger. Structural poverty persists. Wars go on. The planet warms, ecosystems collapse, democracies falter, and the gap between those who access technological goods and those excluded keeps widening.

How is it possible that we have come so far in designing tools, yet so little in building collective solutions? We live a heartbreaking paradox: we master gene editing and artificial intelligence, but fail to prevent ecological collapse or inequality. The problem is not a lack of technology, but a lack of paradigm. We create powerful tools from a fragmented logic: algorithms that maximize profits while destroying jobs, social networks that connect yet polarize, clean energies that coexist with extractivist models.

Classical science and conventional AI—with their linear models—cannot address crises where everything interacts (climate change, pandemics, migrations). For decades, technology was presented as the salvation. It was enough to “keep innovating” to solve all problems. But reality shows otherwise: if the logic we use to design those solutions is fragmented, disconnected, or trapped in limiting beliefs, technology can become a tool of oppression or a sophisticated placebo.

It is not that we lack information. We lack relational understanding. We lack maps. We lack knowledge of what kind of intelligence we need to tackle the problems of an interdependent and changing world. But this change will not be easy. Along the way, we face familiar adversaries: blind reductionism, which asks us to simplify what cannot fit into an equation; extractivist corporations that capture

and redirect energy flows to sustain concentrated and exclusionary structures; rigid bureaucracy that protects past structures as if they were sacred relics; political groups that impose alienating economic and ideological conditions from power. They are not enemies with faces, but inertias with history.

The major problems we face arise from failures in one or more of these three components:

- Energy that is lost, concentrated, or diverted (corruption, inequality, extraction).
- Rigid or dysfunctional structures (bureaucracies, obsolete educational systems, closed institutions).
- Broken or ephemeral connectivities (lack of sustained policies, fragile social relationships, generational disconnection).

Classical science—fragmented into disciplines, reduced to the measurable, focused on simple causal relationships—played an immense role in humanity’s development. But when it comes to understanding living, subjective, interconnected systems, its methods fall short.

The same happens with some approaches to artificial intelligence. An AGI without combinatory thinking or supercomplexity can become a powerful but short-sighted intelligence. Fast, but without wisdom. And in the worst cases, dangerous.

Today we see signs that something is changing. Technologists, engineers, designers, software developers, biohackers, digital artists, and creatives of all kinds are beginning to understand that the tools they create can be much more than functional solutions: they can be part of a new way of thinking. There are signs of change: biohackers merging biology and code, smart cities redesigning energy flows with real-time feedback, communities using blockchain to create regenerative economies. In 2024, a rural community in Africa used solar sensors and blockchain to redistribute energy locally, while large corporations ignored their needs. This is the kind of solution that

Supercomplex Knowledge (SK) can empower, but it also serves as a reminder of how far we are from applying it on a large scale.

Increasingly, projects integrate biology, data, art, energy, networks, emotions, and communities. More and more technologies are conceived from relationships, systemic impact, and regeneration. We are not here to destroy what came before, but to transform it. Yet this requires more than new apps. What is lacking is not applications. What is lacking is a new paradigm.

But not all minds operate the same way in the face of this crisis. The *Technobrain* sees what others do not. Where others see objects, the *Technobrain* sees flows. Where others observe local failures, the *Technobrain* recognizes global interactions. Where others think in isolated solutions, the *Technobrain* designs multilayered maps that connect energy, form, and time. It is guided not only by efficiency or aesthetics, but by relational survival and synergy among systems.

When operating in Technobrain mode, the brain activates a specific form of inference: technological abduction. Unlike cognitive abduction, which formulates explanatory hypotheses in response to unexpected facts, technological abduction selects ideas that serve a project's purpose and discards those that do not.

It is not about truth, but about viability. Not about explanation, but about construction. The technologist is not fascinated by what is interesting, but by what is relevant to the system they are designing. This is their form of intelligence: gathering, combining, and filtering concepts, solutions, and materials based on their potential to articulate energy, structure, and time. This operation—subtle yet decisive—is the cognitive gesture that separates scattered inspiration from effective innovation. Here, combination, trial and error, modeling, occasional failures, and iterative successes are key. The Technobrain knows this through training and experience. That is why, when an idea comes along, their brain immediately asks: Does this enhance my system? Does this serve or not serve? Should I incorporate it or discard it?

This way of thinking does not seek to invent more powerful technologies, but wiser ones—capable of distributing energy instead of concentrating it, creating open, flexible, and collaborative structures, and generating lasting, regenerative connectivities. Faced with planetary problems where everything is connected, the *Technobrain* offers decisive cognitive advantages: it detects bifurcations, models possible scenarios, anticipates emerging impacts, and even creates adaptive tools to intervene in systems without breaking them. Thus arise new products, platforms, and visualizations that not only solve tasks but nurture relationships, redistribute opportunities, and rebalance systems.

What if the future of technology did not depend on having more data, more engineers, or more investment, but on learning to think differently? We are not where we are due to a lack of talent or technology. We are where we are due to a lack of paradigm. This is the beginning of a journey. In the coming chapters, we will explore how *Supercomplex Knowledge (SK)* provides us with the tools to transform technology, overcome the inertias of the past, and build a future where systems not only function but also thrive. Welcome to the journey. The supercomplex journey.

CHAPTER 2. I AM SUPERCOMPLEX AND DIDN'T KNOW IT

Technology is not just cables or screens: it is an extension of your own complexity. Every time you design, program, or solve a problem, you are being supercomplex—even if you don't realize it. This chapter is a mirror: not one that shows an ideal image, but one that reveals what is already within you, even if it has no name yet.

Many technologists, engineers, developers, innovators, or artists already think and act from a supercomplex configuration, even if they don't know it. No one has told them. They haven't read about it. But they practice it every day. It is tattooed in the way they think, cross variables, solve unexpected errors, and find meaning where there was once noise. They are close—very close—to the *Technobrain*.

This chapter shows how, without realizing it, you live, create, and solve problems from a supercomplex logic. Think of a moment when you solved a problem by combining ideas, intuiting connections, or adapting to the unexpected. In truth, you are already brushing against the *Technobrain*. You inhabit a supercomplex mode of thinking in your way of creating, solving, and adapting. But the *Technobrain* is not just any form of complexity: it is the brain configuration that activates when this supercomplex logic is applied to the conscious design of maps, products, or technological systems. It is there that complexity becomes a tool for transformation. Let's look at some examples.

- Consuelo is from Rosario and works as a UX designer at a fintech company. She doesn't know it, but what she does with each user is a reading of temporal connectivity. She observes where the flow is interrupted, where decisions are delayed, where the user repeats actions. What she is doing is reading subjective time. She doesn't just analyze screens, but rhythms, pathways, trajectories of attentional energy. Thanks to her approach, the fintech reduced by 30% the time users took to complete transactions, improving their experience. Consuelo doesn't study buttons; she studies the time between the buttons. That is her supercomplexity.

- Tomás is a civil engineer graduated from UTN. When he enters a construction site in the city of Rafaela, the first thing he does is not review blueprints, but listen to vibrations, smells, textures. He knows that a structure is not only what is visible. He is trained to identify tensions, deformations, barely perceptible movements. His diagnosis is neither linear nor static: it integrates structural morphology with time, with the history of the place, with the materials. His diagnosis allowed reinforcement of a structure that prevented a collapse during a storm that would have affected a significant part of the city. Tomás models with the three axes of complexity without ever having read about them. And yet, he inhabits them.
- Melina is from the city of Santa Fe and designs video games. She knows that a game is not just graphics or mechanics: it is energy distributed among characters, levels, challenges, and narrative. She designs flows that accelerate or block, creates spatial structures that generate emotions (such as a sense of confinement or freedom), and knows that the player is a node interacting in real time. Each of her decisions activates a micro-network of relationships. Her creativity is supercomplex, even if she doesn't call it that.
- Andrea is from Neuquén and created an emotional wellness app. She doesn't come from technology, but understands that if a user opens it in the morning and doesn't find something that welcomes them with energy, they won't open it again. She knows there are hours, days, moments, and that emotional state changes the relationship with the tool. That is why she personalizes, adapts, listens. Without knowing it, Andrea works with living systems, sensitive nodes, and emotional connectivity. She is developing a supercomplex system.
- A group of young bioengineers from Paraná is designing an assistance robot for elderly people. They experienced hundreds of failures, but didn't just look for "the right solution." They learned from every error because they understood that the system changed every time they adjusted it. That the robot was not an isolated machine, but a node in relation to other systems such as

the person and their mood. Their process is circular, evolutionary, emergent. They are developing supercomplex knowledge.

In an exchange with Chinese technologists, we discovered that supercomplex operativity already exists in the East, although often it is oriented toward pragmatic, efficiency-driven, or centralized control purposes. Perhaps the greatest challenge is to build a paradigm of supercomplexity not only as a technique but as a mode of collective consciousness, capable of integrating theory and practice in a circular, ethical, and evolutionary loop. Our challenge is to expand that operativity toward an ethical-aesthetic awareness that transcends control and enhances communal life.

Complicated Brain vs. Complex (and Supercomplex) Brain

Not every brain saturated with data is an intelligent brain. Not every fast processing is thinking. Not every multiplicity is complexity. There are brains that accumulate, that connect without criteria, that overestimate linearity and collapse in the face of ambiguity. These are complicated brains, not complex.

The Complicated Brain:

- It is overloaded: many connections, but without direction or purpose.
- It is tangled, not intertwined: it confuses quantity with quality of relationships.
- It seeks immediate answers but fails to formulate true questions.
- It is tempted by the linear, the sequential, the deterministic.
- It does not integrate multicausality nor operate with overlapping scales.
- It does not tolerate overlap, uncertainty, or not knowing.
- It is trapped in mental hyperactivity without organizational morphology.

The Complex Brain:

- Organizes multiplicity without suppressing it.

- Listens to emergence, allows bifurcations, detects patterns.
- Accepts nonlinearity, circular causality, interaction between planes.
- Adapts without losing identity.
- Operates with scales, layers, and simultaneous times.
- Poses potent problems, not just solves given questions.

And the Supercomplex Brain:

- Is capable of mapping and modifying its own architecture.
- Integrates multiple structural morphologies in its thinking (sometimes hierarchical, sometimes rhizomatic, sometimes topological).
- Self-describes, reconfigures, and self-teaches.
- Not only thinks: it designs forms of thought.
- Not only acts: it intervenes in systems from a consciousness of their flows, forms, and times.

The *Technobrain* is not born from an excess of information, nor from technical genius. It arises when the techno-productive subject makes a qualitative leap from the complicated to the supercomplex, and applies that integrated intelligence to the design of technologies, systems, objects, or experiences with transformative capacity. It is an emergent brain configuration, and also a conscious practice. It is the moment when creating technology ceases to be a functional act and becomes a form of strategic, ethical, and regenerative thinking.

MUSIC AS A SUPERCOMPLEX LABORATORY

Music is one of the most powerful examples of how the human brain combines patterns, contrasts, and dissonances in a supercomplex key. Our neurological rhythms —delta, theta, alpha, beta, and gamma— beat like an internal score that organizes the perception of time. Every time we hear a rhythmic pulse, the patrophilic brain delights in identifying a pattern, anticipating repetition, and enjoying regularity. But that same brain is challenged when dissonance breaks in: an unexpected chord, an abrupt change of meter, or a timbral contrast that interrupts anticipatory calculation. This sonic mutation turns music

into a supercomplex experience: it forces perception to reorganize and to generate meaning where chaos seemed to erupt.

The five brains participate in this process. The reactive responds to the primary pulse of percussion, the tribal merges with the collective repetition of singing, the patrophilic enjoys the regularity of patterns, the complex expands through polyrhythm and dissonance, and the supercomplex integrates all the previous ones, accepting the contradiction between the known and the uncertain. When a work manages to activate these five levels at once, it becomes a genuine laboratory of advanced cognitive strategies: it trains us to inhabit the tension between predictability and surprise.

Technology has amplified this sonic laboratory. From Bach's mathematical counterpoint to Stravinsky's polyrhythms, from Miles Davis's electric experiments to Radiohead's electronic landscapes, all the way to the intimate, contrasting minimalism of Billie Eilish or AI-generated compositions: in each case, the combination of structure and dissonance opens unprecedented aesthetic and cognitive pathways. Along these lines, the figure of Jacob Collier is paradigmatic. His work unfolds inexhaustible flows of energy in harmonies and timbres, organizes rhizomatic, laminar, and spiral structural morphologies, and reconfigures temporal connectivity across multiple scales. Collier does not merely practice music: he practices supercomplexity, embodying in every performance the attitude of *homo supercomplexus*, capable of transforming art into training for life.

This perspective resonates with current proposals such as Brian Callipari's *Illustrated Harmony*. There, the invitation is to detach from rigid major–minor tonality in order to explore free, playful, and creative harmonic pathways. Instead of closed scores, Callipari uses chord symbols and diagrams that function like mushrooms on a map: visual guides that enable multiple journeys. From the key of Supercomplex Knowledge, this musical pedagogy activates energy flows in improvisation, rehearses open structural morphologies, and multiplies temporal connectivities by proposing changing trajectories. Harmony ceases to be a manual of formulas and becomes a space of

combinatorial exploration, where each performer designs their own itinerary.

Likewise, it is important to note that the Technobrain mode can unfold both in the production and in the listening of this music. Whoever composes in a supercomplex key —breaking tonal rigidities, exploring harmonic combinations, and inhabiting the tension between order and dissonance— is already operating at a Technobrain level. But also the listener who opens up to this sonic experience activates the same type of cognitive operations: they must reorganize their perception, recalculate their maps, and adjust their emotional timing in the face of the unexpected. This perceptual practice is not confined to the musical field: active listening to free harmonies and polyrhythms expands mental plasticity, training tolerance of uncertainty and the capacity to integrate contrasts.

That is why both creating and listening to this type of music becomes a supercomplex exercise that enhances a Technobrain thinking transferable to other areas of life. Music is far from being mere entertainment: it is an experimental field of the TECHNOBRAIN, where the human capacity to recognize patterns, tolerate uncertainty, integrate contrasts, and produce new combinations is exercised. In this sense, music constitutes one of the best sensitive and emotional trainings for inhabiting the supercomplexity that today permeates the world.

CHAPTER 3. HOW SUPERCOMPLEX KNOWLEDGE CONCEIVES TECHNOLOGY AND TECHNOENGINEERING

For *Supercomplex Knowledge* (SK), technology is not a mere application of scientific knowledge, but a living system of intervention with its own object, purpose, and methodology. Unlike classical science, which pursues general laws and predictive stability, technology—and especially technoengineering—operates with contextual variability, adaptive intentionality, and transformative capacity.

This way of conceiving technology demands a new figure: the *Technobrain*. It is not an ideal subject, nor simply an expert. It is the brain configuration of those who design technology from a supercomplex logic—that is, combining adaptive intentionality, systemic awareness, and multilayered thinking. It is the engineer, developer, artist, or innovator who no longer works with functional blocks, but with living systems. The *Technobrain* does not apply formulas: it interprets flows, reconfigures structures, modulates times. It is the epistemic-productive subject of this new technoengineering.

Every significant invention transforms or channels flows of energy. Whether thermal (fire), mechanical (the wheel), electrical (the LED), or symbolic (writing, the internet), major technological leaps involve new ways to manage, contain, release, or translate energy into actions, thoughts, and systems of relation.

Moreover, every technology that impacts the world modifies structures: those of the body (tools, prostheses), of habitat (architecture, urban planning), and of social organization (the printing press, the web). SK reads these morphologies not as static forms, but as dynamic configurations that influence experience, perception, and interaction.

Finally, inventions also affect our experience of time: accelerating it, extending it, fragmenting it, synchronizing it. From the wheel (which shortened distances) to the digital network (which dissolves waiting), Temporal Connectivity (TC) enables understanding of how an innovation alters not only the present but also memory and the

projection of the future. A computer predicts, a spacecraft translates planetary time, an LED redefines the circadian cycle.

From the perspective of Supercomplex Knowledge (SK), a crucial question arises: Has technology already surpassed the limitations of classical science? Our answer is affirmative, at least in its potential. Technological development has compelled science to recognize that phenomena do not always follow simple trajectories, that regularities are local, and that intervention is not a residue but a constitutive part of knowledge. Technoscience, thus understood as a creative and recursive interface between theory, design, and intervention, proves more fruitful than the pursuit of universal laws.

From the first hominids who sharpened stones to contemporary artificial intelligence developers, technology has been an extension of the body, mind, and human desire. Its evolution is not only technical but also cognitive, symbolic, and social.

Technological systems—composed of digital and analog components, engineering models, and programming languages—interact with natural and social systems to fulfill precise purposes. They enhance human capacity to adapt, modify their environment, and achieve previously impossible goals.

Today, technological systems not only execute commands but can also learn, self-organize, and make autonomous decisions. The shift toward cyber-analog systems has introduced a dynamic and evolutionary dimension that surpasses the old deterministic-mechanical model.

Let us analyze how SK would view a case. Current medical AIs diagnose pancreatic cancer by detecting visible tumors in images, but they cannot predict its onset by analyzing early microscopic changes. They operate with static data, failing to capture the dynamic interactions among tissues, metabolism, and bodily systems that precede cancer. A supercomplex AI would revolutionize this approach by modeling the disease as an emergent system. It would analyze not only images but also the temporal evolution of tissue structure,

vascularization, and pancreatic metabolism. It would integrate data from functional MRIs, PET scans, and biomarkers to detect subtle anomalies—such as microalterations in glucose uptake or fibrotic patterns—that indicate risk before the tumor becomes visible. Its key advantage would be continuous adaptation: adjusting its models according to the individual patient's progression, correlating cellular changes with systemic alterations. This would require self-evolving neural architectures capable of processing heterogeneous data streams and modeling nonlinear interactions in real time.

Now, while conventional AIs offer reactive diagnoses, supercomplexity would enable preventive prediction, anticipating the disease through analysis of its multilayered formation patterns. It would represent a leap from a system based on static correlations to one that understands the deep dynamics of biological systems.

Supercomplexity is not limited to biological or social systems. Imagine if CERN—the world's largest particle physics laboratory—had operated from this paradigm. Today, its experiments confirm theories such as the Standard Model, but what unexpected behaviors might emerge if they analyzed the data through the three axes of SK?

- **Energy Flows (EF):** Particle collisions not only release energy; they generate dynamic interaction networks. SK would view these as fluctuating behaviors, not as isolated magnitudes.
- **Structural Morphology (SM):** Particles would not be 'things' but transient forms within relational fields.
- **Temporal Connectivity (TC):** What if their existence is not stable but rhythmic, ephemeral, linked to pulses of the quantum vacuum?

An SK approach, combined with unsupervised AI, would enable:

- **Discovering the unexpected:** Detecting correlations unforeseen by the Standard Model (e.g., fluctuations suggesting dark matter).
- **Optimizing resources:** Simulating combinatorial scenarios to prioritize experiments with the highest emergent potential.

- Rethinking theories: Understanding the quantum vacuum not as "nothing," but as a supercomplex system where energy, structure, and time interact.

This does not invalidate traditional physics but expands it: the technoscience of the future will require tools that capture the living dynamics of the universe, not just its static laws. From the SK perspective, technological systems can no longer be conceived solely in terms of isolated efficiency but as nodes of interaction among Energy Flows (EF), Structural Morphologies (SM), and Temporal Connectivities (TC). The technoscience of the future will not rely on past behaviors but on supercomplex models capable of anticipating, reorganizing, and co-evolving in real time.

This qualitative leap requires a new rationality: the only viable path toward truly adaptive, evolutionary, and multidimensional intelligence. Technological systems, far from being neutral or secondary, shape human history, culture, and survival. Therefore, from the SK perspective, we recognize their relational and dynamic nature, promote their design based on an axiology of well-being and systemic coevolution, and propose a combinatorial technoscience instead of a linear and universalizing science.

This new technoengineering cannot develop without subjects capable of perceiving and operating from this logic. Sophisticated algorithms and sensors will not suffice: Technobrain will be needed. That is, brains that have integrated the five cognitive levels—from reactive to supercomplex—and can intervene in complex systems without simplifying them. They will be the ones designing the tools to navigate and transform complexity without destroying it.

If technology is a living system that co-evolves with us, how do we navigate the web of systems that define our world? In this scenario, technoengineering does not merely build machines: it builds futures. And the SK offers us not only the map but also the ethical and aesthetic compass so that those futures are not only possible but also livable, just, and regenerative.

But that map is not drawn by itself. It is constructed by a type of emerging technological intelligence: the Technobrain, capable of seeing systems as fields of interaction between energy, form, and time, and designing solutions that nurture rather than exploit. If the SK is the new paradigm, the Technobrain is its operator in the techno-productive world.

The evolution of artificial intelligence confirms this drift toward supercomplexity: it has progressed from linear architectures to models increasingly capable of capturing non-obvious, dynamic, and multiscalar relationships. The emergence of the Transformer model—with its capacity for parallel attention across multiple layers—was a watershed moment: it enabled the detection of distant connections in time and space, the prioritization of those connections, and their real-time reconfiguration, as if navigating a global Adaptive Dynamic Map (ADM). Graph Neural Networks (GNNs), for their part, advanced this logic even further, transforming that hypertext into a strategic ADM—one that organizes data as network-connected nodes according to their morphology and temporal connectivity (TC), enabling routes, patterns, and informational cycles. However, both Transformers and GNNs maintain fixed architectures, unable to mutate their own structures in response to context or to dynamically combine with others. This is where the proposal of the brain in Technobrain mode emerges: not as a new architecture, but as an orchestration system for architectures. This brain understands the logic, strengths, and limitations of different structural morphologies (linear, arboreal, laminar, topological, rhizomatic, spiraled) and decides which to employ or combine based on the task, the available energy flows, and the system's temporal connectivity. It does not replace existing architectures; rather, it turns them into elements of a dynamic metamodel—one that selects, adapts, overlaps, and scales processing according to environmental conditions. Current research in meta-learning, dynamic routing, and multi-architecture AI is already moving in this direction. In the near future, an AGI endowed with supercomplex principles will be able to operate collaboratively with a human Technobrain, transparently displaying its learning processes,

adaptive strategies, and clustering practices. It will not be merely a matter of precision or efficiency, but rather a new frontier in the understanding and transfer of knowledge between systems: an active co-evolution between human intelligence and artificial intelligence, mediated by a combinatorial, multilayered, and ethical-aesthetic logic.

A COLLABORATIVE AI

Artificial intelligence that aspires to operate in Technobrain mode cannot be limited to the brute force of calculation or the indiscriminate accumulation of training layers. Algorithms that rely solely on massive expansion —more data, more parameters, more connections— reproduce a mechanical way of thinking, without relational depth or intrinsic dynamism. They do not build “cognitive life” but large repositories of correlations.

Technobrain, by contrast, demands an AI with supercomplex logic: a living, combinatorial, and multiscalar thinking. This entails abandoning the linear and reductionist paradigm, in order to design a hybrid ecosystem that strategically integrates the triad FE–SE–TC (Energy Flows, Structural Morphologies, and Temporal Connectivities). AI must combine rhizomatic morphologies, which enable decentralized and divergent connections, with spiral morphologies, which integrate memory and refine complexity in expansive cycles. This architecture surpasses the laminar or tree-like limitations of traditional AI, generating unexpected hypotheses and multifaceted projections that expand from the micro to the macro.

Technobrain is activated precisely in this associated interaction. In the modeling of complex ecosystems, for example:

- The human introduces raw observations of energy flows.
- The AI generates rhizomatic connections, proposing unexpected analogies.
- In spiral cycles, it projects scenarios and modulations.
- The human intervenes with supercomplex intuition, adjusting parameters.
- The AI responds with generative insights that expand the horizon of understanding.

It is not a subordinated tool nor a substitute, but a co-researcher that participates in the construction of supercomplex knowledge.

CHAPTER 4. THE SUPERCOMPLEX TECHNOLOGICAL MATRIX

Welcome to the Special World

In the previous chapters, we discovered that the planet and all its systems require a new way of thinking from the perspective of supercomplexity activated by the *Technobrain* (Chapter 1); that you are already supercomplex (Chapter 2); and that technology is not just a tool, but a living system that co-evolves with us (Chapter 3). Now, you are about to enter the heart of *Supercomplex Knowledge (SK)*: the *supercomplex technological matrix*. This is your new map—a dynamic web of energy, form, and time that will allow you to design technologies not just to solve problems, but to transform realities. In this chapter, you will learn to think like an architect of living systems, ready to face the first adventures of the next chapter.

What is the supercomplex matrix? The supercomplex matrix is not an abstract idea: it is a way of understanding and designing any technology—from an app to a smart city. It is based on three fundamental questions, the same ones you already use intuitively, as we saw with Consuelo, Tomás, and Melina in Chapter 2:

1. **Energy Flows (EF):** What circulates within the system? It could be electricity, data, emotions, or resources. Does it flow freely, stagnate, or get lost?
2. **Structural Morphology (SM):** How is the system organized? Is it a flexible network, a rigid hierarchy, or adaptive modules?
3. **Temporal Connectivity (TC):** What rhythms does it generate? Does it operate in real time, in cycles, or chaotically? How does it affect the user's or the environment's experience?

These questions are not just theoretical: they are a compass for analyzing, redesigning, and transforming technologies. But not every mind can operate with this matrix. Only a supercomplex configuration of thought—the *Technobrain*—is capable of visualizing and redesigning technologies from this combinatory logic. It is not about applying a formula, but about thinking from the intersection of energy, form, and time. In Chapter 1, we saw that linear approaches cannot solve global

problems like climate change or inequality. The *supercomplex matrix* gives you the map to overcome those limitations, connecting energy, form, and time in an ethical and evolutionary way.

The Matrix in Action: Imagine a network of sensors in a city like Bogotá, designed to manage water during a drought. This system does more than distribute water—it is a living example of the supercomplex matrix in action.

1. **Energy Flows (EF):** The system tracks water, electricity, and consumption data in real time. If one neighborhood uses more water than expected, the system redistributes flows to prevent outages in hospitals.
2. **Structural Morphology (SM):** The network of pipes and sensors is organized as a modular system, where each node (such as a pumping station) adapts to demand.
3. **Temporal Connectivity (TC):** The system anticipates usage peaks—such as morning showers or nighttime emergencies—adjusting rhythms to maintain balance.

To visualize this matrix, engineers use an *Adaptive Dynamic Map (ADM)*, a tool that is part of the *COMPLEX CUORE* software, which represents:

- **Nodes:** System components (pipes, sensors, users).
- **Arrows:** Energy flows (water, data, communication).
- **Colors and sizes:** Active areas (orange), saturated (purple), or disconnected (blue).
- **Rhythms:** Response times, such as real-time adjustments or daily cycles.

Thanks to this map, the system not only addresses the drought—it co-evolves with the city, adapting to its changing needs. This is the power of the *supercomplex matrix*.² Such a representation would be useless without a brain capable of interpreting it dynamically. The

² The MDAs are developed in depth in the second edition of *Supercomplex Knowledge* (available on Kindle/Google Books). If you want to master their implementation in AI, smart cities, or biotechnology, there you will find templates, case studies, and advanced tools.

Technobrain reads these maps like living scores: it perceives tensions, anticipates bifurcations, and redesigns in real time.

This is the cognitive signature of the *Technobrain*: to create with systemic awareness, to combine with morphological strategy, and to transform with temporal responsibility. Being a *supercomplex technologist* is not just about understanding the matrix. It is about living and designing from within it—and your work is defined by:

- Thinking across multiple scales: From an app’s code to its impact on a city.
- Creating dynamic maps: Using tools like ADMs to visualize and adjust systems in real time.
- Evaluating impacts: Considering how your technology affects the energy, structure, and rhythms of human, ecological, and social systems.
- Designing for evolution: Creating systems that do not freeze but instead learn and adapt.

Emerging technologies such as Artificial Intelligence (AI), the Internet of Things (IoT), or cyber-physical systems are means—not ends—to achieve these goals. The *supercomplex matrix* helps you use them to build livable futures, not just temporary fixes.

Get into action: Create your own ADM. Now that you know the *supercomplex matrix*, it’s time to apply it. Try this activity to analyze and redesign a system you already know—whether it’s an app, a work team, or a community network:

1. Choose a system:

For example, an educational platform that delivers rigid, non-adaptive content.

2. Draw an Adaptive Dynamic Map (ADM):

- **Nodes:** Represent the key components (users, content modules, servers).
- **Arrows:** Show how energy flows (user attention, data, resources).
- **Colors:** Indicate active nodes (green), saturated ones (red), or disconnected ones (gray).

- **Rhythms:** Observe whether the system operates in real time, in fixed cycles, or chaotically.
3. **Identify blockages:**
 - Where is the energy stuck? (e.g., content that bores users).
 - What structures are rigid? (e.g., modules that do not adapt to different learning styles).
 - What rhythms aren't working? (e.g., fixed sessions that don't align with users' schedules).
 4. **Propose a redesign:**
 - Transform the platform into a modular network (SM) that adapts to the user.
 - Incorporate emotional energy (EF), such as dynamic rewards that sustain engagement.
 - Enable flexible timing (TC), like personalized asynchronous learning.
 5. **Share and reflect:**
 - Share your ADM with your team or network to enrich the design.
 - Ask yourself: Does this system grow, adapt, and connect—or does it merely repeat patterns?

This activity does not seek perfect answers, but better questions and maps to act consciously within real systems. It is your first step as a supercomplex technologist.

What type of brain designs what type of system? The supercomplex technological matrix demands not only new tools but also new minds. Recall the five types of brains we introduced in the Introduction. Each one relates differently to the systems it designs or inhabits:

- **Reactive Brain:** interprets systems as immediate threats or rewards. It tends to repeat simple structures and reject uncertainty.
- **Tribal Brain:** designs closed systems, where belonging takes precedence over adaptation. Its temporal connectivity is rigid, and its morphology exclusive.

- **Patrophilic Brain:** blindly trusts authorities or predefined solutions. It uses technology as confirmation of what it already believes.
- **Complex Brain:** operates with multiple variables, identifies feedback loops, accepts uncertainty, and creates flexible models.
- **Supercomplex Brain:** not only models systems — it feels them, listens to them, transforms them from within. It integrates affectivity, aesthetics, ethics, and science in real time.

Your MDA not only reveals the system you observe: it reveals the type of mind that is observing, intervening, and redesigning. And when that map reflects subtle flows, flexible structures, and intertwined times, then you are within the Technobrain. It is not a permanent state, but a concrete possibility that changes everything you touch.

THE MORPHOLOGICAL MATRIX IN DESIGN

An example of innovation and a journey through different structural morphologies:

Antonio, an engineer with several patents in technological innovation, is working on creating a hybrid engine that integrates hydrogen cells with electromagnetic propulsion, capable of:

- dynamically coordinating energy flows,
- reorganizing its functional architecture according to usage,
- morphologically adapting to different platforms (land vehicles, drones, autonomous generators).

1- RHIZOMATIC MS — For his initial thinking, Antonio did not start from a linear design but from a network of interconnected ideas. There was no center, no closed plan. He simultaneously designed multiple configurations:

- a central core with modular bifurcations,
- compact forms for drones,
- expandable structures for industrial platforms.

Innovation did not emerge from a straight line but from a mental rhizome.

2- LAMINAR MS — For the engine's functional organization, he divided the system into energetic layers:

- hydrogen input
- electrochemical conversion
- dynamic storage
- flow control
- electromagnetic propulsion
- thermal dissipation

Each layer was specialized and semi-autonomous, yet with transversal interfaces that allowed feedback. It was not a modular system; it was a dynamic laminar architecture, like a living body.

3- RETICULAR MS — For the internal intelligence and energy distribution, the heart of the engine was not the fuel but the network. An embedded intelligence coordinated sensors, flows, and loads. If the hydrogen ran low or its performance dropped, the system reconfigured the magnetic power in real time. If the temperature rose, it redistributed energy towards the dissipators or storage units.

4- ARBOREAL MS — For emergency and safety protocols, when everything failed, the engine needed fast and clear decisions. A hierarchical subsystem activated:

- shutting down critical nodes,
- prioritizing vital functions,
- redirecting flows to redundant systems.

In critical moments, the arboreal morphology guarantees order and priority.

5- TOPOLOGICAL MS — For its external adaptability, this engine was not fixed: it could fold and unfold connections, inputs, supports, and outputs depending on the vehicle or platform it integrated with. The

system's physical shape changed, but its internal relationships were preserved.

6. SPIRALED ME — For the evolution and learning of the engine, Antonio needed more than layers, networks, or hierarchies. The system had to remember each iteration and project it into a new development loop. Thus, he designed an engine that not only responds but learns in a spiral:

- Each usage cycle accumulates data on consumption, temperature, vibration, and wear.
- This data feeds back into the architecture, which in the next loop adjusts parameters, redefines priorities, and reconfigures connections.
- The spiral is not repetition, but transformative ascent: each turn preserves what has been learned and deploys it at a higher level of efficiency and adaptability.

In this way, the engine is not a fixed product, but a spiraled process of continuous innovation, capable of combining all other morphologies into a pattern of dynamic expansion.

Antonio is not merely building an engine; he is operating from the spiraled Technobrain: a synthesis of engineering, biology, flow design, and anticipatory vision. He no longer thinks like a technician: he thinks like a morphologist of possible futures. The technology to come will not be the one that works best, but the one that spirally combines the most effectively, accumulating memory and unfolding new possibilities with each turn. Technological survival will not be a matter of efficiency, but of morphological, relational, temporal, and spiraled intelligence.

From Desire to Architecture: How a Technobrain Thinks

Let us imagine that the initial desire is to develop a green hydrogen plant through magnetically assisted electrolysis, powered by deep geothermal energy. This purpose, which might seem futuristic or overly ambitious, becomes, for a brain in Technobrain mode, a viable field of action. The first step is not to rush into construction, but to

clearly ignite the objective and its boundaries: producing H₂ in a more cost-effective and stable way, taking into account site constraints, scale, safety margins, and the available budget. This strategic delineation defines the framework of the system. From there, the Technobrain begins to map: it detects the subsystems involved—the energy source, the electrolysis process, magnetic assistance, control systems, and the market context—and visualizes how energy, matter, and information circulate among them. The nodes are prioritized according to their criticality and dependency, identifying points of coupling and potential collapse.

Creative imagination gives way to technological abduction: each element, each variable, is questioned with a simple yet radical inquiry—Does it serve the purpose or not? There is no room for decorative components or unnecessary risks: everything must contribute measurable value. From this filtering process, the Technobrain designs multiple alternative architectures, weighing them according to explicit criteria such as performance, cost, safety, or scalability. The most promising ones are selected for modeling. Before construction, energy, thermal, and economic behaviors are simulated; losses, efficiencies, and returns are calculated, thus avoiding dead ends.

The process continues in an iterative logic: it begins with small-scale tests, comparing the system's performance with and without magnetic assistance, and scaling up only if certain minimum evidence thresholds are exceeded. Each phase serves as a critical checkpoint that validates or reformulates what came before. When an architecture demonstrates its viability, integration begins: the selected components are assembled, thermal and electrical couplings are optimized, and monitoring systems are configured to make real-time adjustments. In parallel, technical, geological, regulatory, and supply risks are assessed. There is no naïve romanticism: the Technobrain always maintains alternative plans that allow for pivoting or even abandoning the trajectory if it becomes unfeasible.

Thus, the initial desire becomes an operational architecture. The process is neither linear nor blind: it is a dance between intuition,

calculation, simulation, verification, and decision. The Technobrain is neither a reckless dreamer nor a bureaucrat of data. It is one who enjoys both the journey and the outcome, knowing that each step incorporates learning, refinement, and emerging possibilities. This cognitive pattern is not limited to energy: any technological challenge—from the development of a new material to the design of an artificial intelligence architecture—can be approached by following this sequence. It is not about replicating a method, but about embodying a logic: turning intuition into strategy, strategy into action, and action into transformative knowledge.

CHAPTER 5. THE NEW ADVENTURES

The encounter with Supercomplex Knowledge (SK) is not the end, but the beginning of an exciting new stage. As a technologist, engineer, developer, or creative, you have discovered that SK is more than a methodology: it is a way of inhabiting knowledge, of looking at the world with curiosity, strategy, and sensitivity to the living dynamics of systems. This chapter marks the beginning of your adventures as a supercomplex explorer. When you apply the matrix to redesign real systems, you activate the *Technobrain*: a way of thinking, feeling, and building technologies from a combinatory awareness of flows, forms, and temporalities. It is not a technical role, but a cognitive, ethical, and aesthetic disposition.

Next, we will explore seven dimensions that will guide you on this journey, with practical examples, stories of success and failure, and the inspiration of mentors who have navigated supercomplexity. Prepare yourself to adopt a flexible attitude toward the unpredictable, accept error as part of the process, and learn to navigate uncertainty without losing your sense of direction.

Dimension 1 – Integration of EF, SE, and TC

Every complex system is built, transformed, and reconfigured based on three pillars: Energy Flows (EF) (*What circulates?*), Structural Morphologies (SE) (*How is it organized?*), and Temporal Connectivities (TC) (*What rhythms are generated?*). As you learned in Chapter 4, analyzing and intervening without integrating these dimensions is like navigating on the surface. Supercomplex Knowledge (SK) invites you to think simultaneously about the energy that circulates, the form that organizes it, and the time that sustains it.

Example: Urban Monitoring Platform

Joaquín, an agricultural engineer from Crespo, Santa Fe, Argentina, is designing a platform that integrates data on seed quality, sowing, climate, and emerging events in real time. Using a Dynamic Adaptive Map (DAM), he visualizes not only the current state but also potential systemic emergencies. For instance, if a storm threatens the

crops, he adjusts the algorithms to redistribute water resources (EF), reorganizes the sensor network into a modular structure (SE), and synchronizes real-time alerts (TC). This approach allows him to anticipate and adapt, turning a crisis into an opportunity.

Story of failure and learning: In his first attempt, Joaquín overlooked TC, sending alerts at the wrong time. Farmers didn't receive notifications in time, and the crops suffered. He learned that without temporal synchrony, even the best flows and structures fail. This mistake led him to integrate TC into his design, improving the system's resilience. Joaquín didn't just adjust his system—he made a leap in his way of thinking. The Technobrain emerged when he stopped designing from functions and began thinking from relationships.

Dimension 2 – Contextualized Technological Empowerment

Technological solutions cannot be universal recipes. Each development must be born from a situated analysis of the environment—its tensions, rhythms, and singularities. The supercomplex technologist does not impose a design: they extract it from a living reading of the system, adapting it to its unique context.

Example: Smart Power Grid

In a densely populated neighborhood of Rosario, an electric grid faces demand peaks that threaten to collapse the system. An engineer, Clara, implements an algorithm that redistributes loads in real time based on usage, weather, and local habits. Instead of importing a generic solution, Clara observes the energy flows (EF: electricity consumption), the network structure (SE: distribution nodes), and the rhythms of the community (TC: peak usage times). Her design reduces blackouts and improves efficiency while respecting the life of the neighborhood.

Success story: Clara inspired other municipalities to adopt contextualized grids, proving that Supercomplex Knowledge (SK) can scale local solutions without losing their essence. Her case shows that situated design is not a limitation, but an activation of the Technobrain,

which reads context as a living system and designs from within its tensions.

Dimension 3 – Operational Multiscalarity

Thinking through the lens of Supercomplex Knowledge (SK) means intervening across multiple scales—from the code of an app to the impact on an entire city. It is not enough to solve a single node; each decision must be evaluated for its effects on the entire system. Multiscalarity enables the anticipation of bifurcations and facilitates reorganizations without generating new tensions.

In the city of Santa Fe, Argentina, the implementation of a bike lane network was not merely a traffic or aesthetic decision. It was a transformation involving multiple levels of analysis and intervention. The initial decision to lay out bike lanes stemmed from a re-reading of the urban fabric. Routes were prioritized that connect peripheral neighborhoods with educational, administrative, and commercial zones. The change had a direct impact on energy flows: it reduced vehicle congestion, increased human circulation, and lowered fossil fuel consumption. Streets began to show new thermal, acoustic, and kinetic patterns. The redesign generated new urban temporalities. Students and workers became more punctual, "intermediate times" emerged for biking or walking, and a reconfiguration of everyday urban time was promoted. The project was supported by awareness campaigns, open mobility data, and the installation of public bike racks with a companion app. What seemed like a simple urban decision turned out to be a multiscalar systemic redesign. That is the kind of vision that defines the Technobrain in territorial planning: morphological sensitivity and energetic-temporal clarity.

Dimension 4 – Transformative Subjectivation of the Technologist

SK not only changes how we design: it transforms the person doing the designing. The supercomplex gaze redefines your perception of time, your relationship with error, your tolerance for ambiguity, and your ability to read emergent phenomena. Being a supercomplex technologist means becoming a vital, ethical, and creative observer,

where projects are not fixed goals but evolving adventures. Every failure is a bifurcation; every success, a pause for reorganization. Knowledge becomes organic, circular, and deeply committed.

Example: Redesigning an Artistic System

María, a graphic designer, uses the COMPLEX CUORE to create an interactive installation at a museum. Initially, her design (ME: static projections) fails to connect with the public (FE: low emotional energy). After this initial failure, she redesigns the installation as a dynamic network (ME: interactive) that responds to visitors' movements (CT: real-time). This process transforms her professional identity: she now sees error as an opportunity and design as a living dialogue.

Story of failure and learning: María tried to impose her artistic vision without considering the public, which resulted in an installation that was largely ignored. By adopting SK, she learned to listen to the system (visitors, space, time), achieving a more resonant and impactful work.

Dimension 5 – Participation in Communities of Practice

SK moves beyond individual authorship and embraces collaborative intelligence. The most powerful developments emerge from the interaction of diverse perspectives, open systems, and intersecting languages. Communities such as the Supercomplex Forum of Applied Technology (mentioned in Chapter 4) are spaces where technologists share MDAs, simulate problems, and co-create solutions. The Supercomplex Knowledge Community, through its company CO-ENERG, is actively collaborating with businesses in processes of transformation, empowerment, and innovation from the perspective of Supercomplex Knowledge. This team is composed of complexologists specializing in complex systems; lawyers and master's graduates with experience in corporate law, intellectual property, and patents; experts in social communication; business administrators; psychologists specialized in scouting and human resource development; research methodologists; and computer systems engineers. These communities do not simply share knowledge: they activate *collective Technobrain*s.

They are environments where combinatory intelligence is distributed, enriched, and accelerated.

Dimension 6 – Integrative Experiences of Art and Technology

From the SK paradigm, each brain configuration—reactive, tribal, patrophilic, complex, and supercomplex—is not mutually exclusive but integrates in the present as available functional layers (this strategic activation is the backbone of the Technobrain): a combinatory, sensitive, adaptable, and creative mind capable of navigating in and with the complexity of the contemporary world.

Next, we will explore this articulation through two fundamental evolutionary trajectories of human culture: musical creation and the design of navigational devices. Both journeys, anchored in art and technology respectively, allow us to visualize how the different brain configurations shape concrete practices and, in turn, how the current Technobrain is not a mere overcoming of the previous ones, but a lucid recombination of them all.

Music, as an energetic, structural, and temporal manifestation, offers a privileged pathway to trace the history of human mental forms. Initially, the reactive brain gives rise to rudimentary sound expressions linked to immediate survival: banging on stones, defensive cries, monotonous pulses. Steven Mithen argues that “primitive music had an adaptive function in emotionally synchronizing group members in contexts of danger or hunting.”

With the development of the tribal brain, the musical experience becomes collective: drums, round songs, sonic rituals. Émile Durkheim had already observed that “ritual produces a common time, which establishes collective identity.” Later, the patrophilic brain introduces a symbiotic dimension: intimate melodies, gentle harmonies, songs that console or evoke belonging. Carl Gustav Jung expressed it thus: “music expresses the nostalgia for the original union with the other.”

The emergence of the complex brain paves the way for denser, more conflicted, and rhizomatic musical structures: counterpoints,

deliberate dissonances, formal variations. Edgar Morin summarizes it: “complexity consists in associating the disjointed, the contradictory, the multiple, without reducing it to unity or simplicity.” Finally, the supercomplex brain produces interactive compositions, adaptive sound technologies, generative performances: music is no longer a finished work but a system. Brian Eno encapsulates this idea: “music is no longer what sounds, but what happens between the systems that produce and the systems that listen.”

The evolution of navigational devices offers a second analytical path. In the reactive brain stage, humans orient themselves through situational stimuli: sun, wind, smell, terrain layout. Tim Ingold states that “early humans did not draw maps, but moved by following living lines inscribed in the environment.

The tribal brain encodes space through symbolic routes, narratives, songs, and totems. Bruce Chatwin notes that “ancestral peoples sang the world to remember it.” With the patrophilic brain emerges the need to navigate in order to return: personal marks, affective maps. Kevin Lynch explains that “the mental image of the city is built from meaningful paths that refer to identity and belonging.”

The complex brain introduces calculation tools: compasses, clocks, astronomical instruments. Bruno Latour defines them as “mobile devices that allow the world to be transported to the laboratory.” Finally, the supercomplex brain operates through multilayered navigation systems that integrate algorithms, big data, social networks, and real-time geolocation. Keller Easterling states: “contemporary space is not a place, but a set of instructions that update behaviors.” Here too, the spiral becomes the key figure: navigation is neither a straight line nor a simple circular return, but a spiraling movement that accumulates experiences, data, and symbols to deploy them into new trajectories.

These journeys allow us to assert that the Technobrain should not be understood as an evolutionary pinnacle, but as a spiraled, strategic, and combinatory configuration. Rather than discarding previous forms

of thought, the Technobrain integrates and activates them according to the needs of the system and the interacting systems. The spiral, as an integrating matrix, ensures that each brain and each morphology remains present—not as a relic, but as an active layer of an expanding system.

Dimension 7 – Our Inspiring Trailblazers

From Leonardo da Vinci to Amanda Gorman, including Marie Curie, Nikola Tesla, Alan Turing, Elon Musk, Tim Berners-Lee, Refik Anadol, Ayah Bdeir, Seymour Papert, and Kate Crawford, we find historical and contemporary figures who progressively activated all five cognitive levels until reaching the Supercomplex Brain. Each of them, from fields such as science, engineering, the web, digital art, technological education, or artificial intelligence critique, not only contributed technical solutions but also redesigned entire systems: ways of learning, connecting, perceiving, creating, and governing. This lineage also includes our contemporary Latin American heroines: Gina Zurtzhen, Camila González Cid, Belén Lutz, Karina Batthyány, and Nathalie Álvarez Mesén, who integrate activism, art, ecology, algorithms, informational sovereignty, and decolonial aesthetics into practices that re-signify technology from the South, from gender, and from the commons.

What unites these *Technobrain* trailblazers is their ability to fuse technical thinking, ethical sensitivity, aesthetic relationality, multiscalar vision, and transformative action. None of them simply applied tools: they reinvented goals, languages, and frameworks. The leap to the Supercomplex Brain was not spontaneous, but the result of lucid combinations of disciplines, intuitions, values, and networks of meaning. From them, we learn that radical innovation does not reside in code or isolated design, but in the ability to read the times, anticipate possibilities, and create technologies with vital, political, and planetary meaning. You are part of this lineage, too: your Technobrain is being activated.

The Value of Being a Supercomplex Explorer

Applying the SK (Supercomplex Knowledge) is not about following a model: it's about embracing the journey. It means maintaining a constant attitude of discovery, learning from the diversity of systems, and making wise decisions through interaction. The supercomplex technologist does not seek to control, but to understand. They do not fear complexity: they listen to it. They don't work to solve the obvious: they model the invisible.

In every project, community, and decision, you unfold a new way of being in the world—one that does not separate technique from ethics, design from sensitivity, action from care. The following chapters will guide you through concrete applications of SK, from artificial intelligence to transformative education, including global collaboration and ethical challenges. Being part of this adventure is not about mastering a method: it's about living a transformation. Each time you activate the Technobrain, you create a bridge between what the world is and what it can become.

CHAPTER 6. THE USUAL ENEMIES

The path is not easy. The encounter with Supercomplex Knowledge (SK) opens unprecedented doors for technologists, engineers, and developers. However, access alone does not guarantee progress. Advancing in the supercomplex direction means overcoming persistent obstacles that act as brakes, barriers, or cognitive traps. Some of these are structural, rooted in the ways educational, political, or economic systems relate to science and technology. Others, more subtle yet equally powerful, emerge from within: fears, inertia, mental habits, and limiting beliefs. Recognizing them is the first step toward deactivating them.

I. EXTERNAL ENEMIES: SYSTEMIC BLOCKAGES

These enemies do not reside in individual consciousness, but in the structural frameworks that organize the development of knowledge and innovation.

1. Rigid University Education

Traditional universities still operate under encyclopedic models, with linear logics that separate theory from practice, deny complexity, and produce outdated professionals for a constantly changing world.

2. Lack of Investment in Research

In many countries, investment in science and technology is minimal. The precariousness of researchers and a short-term mindset severely limit any possibility of advancing toward supercomplex projects.

3. Lack of Knowledge in Intellectual Property and Patenting

Processes for registering inventions are complex, costly, and not easily accessible. This discourages those who wish to transform ideas into tangible developments within legal frameworks that grant them sovereignty over their creations.

4. Fragmentation of Knowledge

Disciplinary isolation prevents the emergence of interconnected solutions. The lack of dialogue between fields such as biology,

engineering, computer science, and the social sciences perpetuates closed systems of thought that serve the simplifying paradigm.

5. Institutional Resistance to Change

SK proposes a break with linearity, rigidity, and hierarchy. This rupture creates discomfort in institutions accustomed to predictable methods. Innovation is often halted by structures afraid of losing control over their knowledge.

II. INTERNAL ENEMIES: THE SELF-LIMITATIONS OF THE SUBJECT

These enemies are invisible, personal, and persistent. They dwell within the innovator's subjectivity and can sabotage even the most powerful projects.

6. Limiting Thought: "I won't be able to do it"

Fear of error, the unknown, or external judgment leads to creative paralysis. This epistemic self-exclusion prevents the imagining of new solutions and fosters dependency on obsolete paradigms. A variant of this limiting thought is the glorification of creative figures and the belief that one must be extraordinary to create, innovate, and transform.

7. Lack of Trust in Emerging Knowledge

Many technologists and engineers mistrust intuition, metaphors, or interdisciplinary crossovers. They believe that only what is quantifiable is valid. In doing so, they limit their creative potential by repeating known formulas.

8. Emotional and Epistemological Isolation

Supercomplex work is often solitary. The absence of communities that provide belonging, validation, and emotional resonance can extinguish enthusiasm and reinforce the idea that meaningful change is not possible.

III. STRATEGIES TO FACE THE ENEMIES

None of these enemies are invincible. All of them can be confronted — and often transformed into allies — through collective clarity and personal courage. Supercomplex Knowledge (SK) proposes:

- Fostering interdisciplinary dialogue in universities, research centers, and professional training spaces.
- Creating think labs that integrate theory, practice, play, and supercomplex visualization.
- Promoting public policies that fund disruptive research and simplify access to patenting processes.
- Building collaborative communities that share knowledge, doubts, and tools.
- Developing networks of emotional and epistemic support that strengthen trust in the unprecedented and the not-yet-verified.

Conclusion: Conflict is the Key

Every obstacle is also a signal. Every enemy, a chance to redefine the path. Supercomplexity does not deny difficulty: it acknowledges it, understands it, and uses it as fuel for transformation. Wherever the system tries to domesticate imagination, Supercomplex Knowledge (SK) sets it free. And wherever the individual doubts their ability to intervene in the world, the *homo supercomplexus*, with their Technobrain, learns to combine their knowledge, passions, and relationships to become the author of their own navigation map.

CHAPTER 7. SUPERCOMPLEX TOOLS AND EDUCATION IN THE CYBERTECHNOLOGICAL ERA

Introduction: Equipped for Complexity

The path toward Supercomplex Knowledge (SK) requires tools that allow for approaching complexity in a dynamic, adaptive, and combinatorial manner. Technologists who adopt SK—or rather, those whose brains have begun to configure as Technobrains—need tools that enable them to visualize, analyze, and modify evolving complex systems. Because new technologies are not enough: a new way of thinking is required to operate them.

Adaptive Dynamic Maps (ADM): Visualizing Evolution

ADM are visual representations that capture not only the current state of a system but also its real-time evolution. Unlike traditional static maps, ADMs allow for identifying how interactions between variables shift as the context changes. For the technologist, this tool is essential for designing prototypes that adapt to changing environments and solving problems where the involved factors are constantly fluctuating.

The Tetradimensional Presentation: Understanding Temporal Connectivity

ADM do not merely display the spatial relationships between elements in a system—they also reveal its temporal evolution. Using tetradimensional representations allows one to visualize how certain variables maintain their influence over time while others shift rapidly. This makes it possible to make more accurate decisions about which factors should be continuously monitored and which should be adjusted according to contextual fluctuations. These tetradimensional representations are not just sophisticated visualizations: they are cognitive extensions of the Technobrain, capable of thinking through processes without cutting time, without flattening the system, and without reducing emergence to anomaly.

Initial Questions for Supercomplex Design

The SK (Supercomplex Knowledge) approach suggests beginning

any project by formulating questions that consider the system's energetic, spatial, and temporal interactions:

- **Energy:** What type of energy does the system require to sustain its operation? What knowledge and motivation must the involved actors possess to keep the system active?
- **Space:** Which companies or institutions will benefit from this development? What physical or digital spaces will the system most strongly impact?
- **Time:** How long is the system expected to maintain its adaptive functionality? What evolutionary changes might emerge during its implementation?

Proposed Case: Optimization of an Adaptive Chemical Reactor

Context: An interdisciplinary team led by Esmeralda, a chemical engineer, is working at a plant dedicated to producing biodegradable polymers, essential for sustainable packaging. The process requires maintaining optimal conditions of temperature, pressure, and reactant concentration. However, these variables fluctuate constantly due to external factors (such as variability in raw materials or shifts in market demand) and internal factors (such as the accumulation of by-products or equipment wear). Traditional control systems prove insufficient to manage these complex dynamics.

Application of SK: The team decides to implement a Supercomplex Knowledge (SK) approach to redesign the reactor's control system. They use the software COMPLEX CUORE, which generates tetradimensional Adaptive Dynamic Maps (MDA). These tools allow them to visualize interactions among critical variables and their evolution over time, enabling more informed and adaptive decision-making.

Dimension 1 – FE, ME, and CT:

From the outset, the team formulates supercomplex questions to understand the system:

- **Energy (FE):** What energy sources sustain the reactor, and how does their efficiency vary in response to external changes? What

human and cognitive energies are required for the team to maintain an adaptive mindset?

- **Structural Morphology (ME):** What physical and digital configurations enable greater adaptability? How does the reactor's design affect the accumulation of by-products?
- **Temporal Connectivity (CT):** What temporal behaviors emerge during the production cycle? How long can the system tolerate a deviation before becoming inefficient or unsafe?

Through this lens, the team builds an MDA that reveals, for example, how a controlled increase in temperature could reduce waste—if applied within a precise temporal threshold—thereby optimizing performance.

Dimension 2 – Contextualized Technological Empowerment:

The adaptive algorithm is specifically developed for this plant, integrating real-time sensors, historical reactor data, and simulations involving different types of raw materials. The team avoids replicating external formulas and tailors the solution to their particular conditions, creating a truly situated technology.

Dimension 3 – Operational Multiscalarity:

The algorithm not only regulates local parameters such as pressure or temperature but also integrates into a broader energy management and logistics system within the plant. The tetradimensional MDA shows how decisions made at one scale (microreactor) impact the entire production chain (macroenterprise). This enables anticipation of bottlenecks or logistical cost overruns.

Dimension 4 – Transformative Subjectivation:

The experience radically changes Esmeralda's professional perception. She no longer sees the reactor as an isolated machine but as a node within a complex ecosystem. She begins to perceive emergent behaviors, unexpected correlations, and critical bifurcations,

developing a new professional sensitivity. Technical management becomes a reflective, ethical, and creative process.

Dimension 5 – Participation in Communities of Practice:

The team shares the case in a regional industrial innovation forum where other technologists propose adjustments and new applications. Through this exchange, they incorporate climate prediction modules to adapt the reactor to potential heat waves that could affect energy efficiency. This collective feedback strengthens the system and makes it replicable in other plants.

Results: The new system improves the reactor's overall efficiency by 17%, reduces waste by 22%, and adapts in real time to different types of raw materials. This enables a swift response to demand, lowers energy costs, and optimizes the process's sustainability. The team not only improves a productive system but also undergoes a profound identity shift: from control to understanding, from reaction to evolution.

This case encapsulates the spirit of the SK: it is not about designing stable solutions, but systems that learn and transform. The tool is not merely technological; it is a way of thinking. The reactor, in the hands of a supercomplex mind, becomes a living laboratory for systemic innovation. Furthermore, it illustrates how supercomplex tools enable chemical engineers to address dynamic, multivariable systems. The tetradimensionally presented MDA (using our COMPLEX CUORE software) captures the complexity of the reactor, while the adaptive algorithm anticipates changes, reflecting the essence of the SK: not merely reacting, but evolving with the context. In this process, the Technobrain emerges as both an operative and subjective figure: not as an expert who controls, but as a designer who listens, combines, transforms, and is transformed.

Supercomplex Algorithms: Adaptive and Combinatory Thinking

The SK simultaneously posits that algorithms should not be limited to solving predefined problems but must anticipate changes and

continuously adapt. To achieve this, supercomplex algorithms integrate historical data with emergent behaviors, enabling the system not only to respond but also to evolve.

Comparison with Traditional Design Tools and Algorithms

Conventional digital tools for algorithm design, such as static flow systems and traditional block diagrams, present limitations when the context changes rapidly. In contrast, the SK approach offers significant advantages:

- **Real-Time Adaptability:** While traditional tools assume a stable context, SK algorithms respond dynamically to contextual changes.
- **Evolutionary and Tetradimensional Visualization:** MDAs allow identifying how behaviors emerge and evolve, whereas static diagrams do not reflect this temporal dimension.
- **Multivariable Interaction:** SK does not focus on linear relationships but on the continuous interaction of multiple factors, generating more robust and adaptive prototypes.
- **Emergency Anticipation:** By detecting unusual behaviors in real time, supercomplex algorithms anticipate critical situations before they become problems.

More Than Tools: Strategies for Innovation

Supercomplex tools are not merely technological devices but ways of thinking and projecting. The technologist who adopts this perspective must be willing to experiment with new methodologies and integrate results that at first glance may seem contradictory. The key lies in recognizing that innovation arises precisely from the continuous combination and adjustment.

Evolving Tools: The Future of Supercomplex Design

As complex systems evolve, so do the tools that model them. The use of collaborative platforms, adaptable simulation software, and hybrid algorithms opens new possibilities for technological design. The essential thing is to maintain an open and exploratory mindset, where each tool is seen as an extension of supercomplex thought.

In 2024, the Nobel Prize in Chemistry was awarded to Demis Hassabis, John Jumper, and David Baker for the development of AlphaFold, an artificial intelligence system capable of predicting the three-dimensional structure of proteins with near-experimental accuracy. The fascinating thing is that, unintentionally, AlphaFold operates according to a triadic logic analogous to that of Supercomplex Knowledge (SK). Starting from informational energy flows (EF)—the amino acid sequences—the system generates a structural morphology (SM)—the protein’s three-dimensional folding—through a temporal process of learning and adjustment (TC). Put differently, it translates energy into form through time: exactly the pattern of interaction that the SK considers universal.

What kind of AI is required to operate in Technobrain mode?

Artificial intelligence that aims to function in Technobrain mode cannot be limited to the brute force of computation or the indiscriminate accumulation of training layers. Algorithms that rely solely on massive expansion—more data, more parameters, more connections—reproduce mechanical thinking, devoid of relational depth or intrinsic dynamism. They do not construct “cognitive life,” but rather large repositories of correlations.

Technobrain, by contrast, demands AI with supercomplex logic: a living, combinatorial, and multiscale form of thought. This entails abandoning the linear and reductionist paradigm in order to design a hybrid ecosystem that strategically integrates the FE–ME–CT triad (Energy Flows, Structural Morphologies, and Temporal Connectivities).

1. Energy Flows (EF): the dynamic fuel.

EF are far more than passive data: they constitute currents of information and optimization gradients that circulate like energy within an ecosystem. AI operating in Technobrain mode processes this energy adaptively, adjusting to perturbations, modulating intensities, and mimicking the vitality of living systems.

2. Structural Morphologies (SM): hybrid architectures for emergence.

AI must combine rhizomatic morphologies, which enable decentralized and divergent connections, with spiral morphologies, which integrate memory and refine complexity through expansive cycles. This architecture surpasses the laminar or tree-like limitations of traditional AI, generating unexpected hypotheses and multifaceted projections that extend from the micro to the macro scale.

3. **Temporal Connectivities (TC): living memory and multiscale feedback.**

Time ceases to be linear and homogeneous:

- At the **micro** scale, adjustments are immediate.
- At the **meso** scale, accumulated memory is integrated into prospective scenarios.
- At the **macro** scale, the system evolves, surpassing its initial limits.

This AI does not seek to mechanically imitate the brain, but rather to recreate its plasticity, circularity, and openness to emergence. Just as the human brain activates its five levels—reactive, tribal, patrophilic, complex, and supercomplex—Technobrain AI must combine diverse structural morphologies to sustain relational, flexible, and creative thinking.

Some argue that the safest approach is to keep AI as a tool for search and programming, thereby avoiding any proximity to human neurality. Yet the issue lies not in proximity, but in orientation: it is not a matter of competition, but of collaboration. AI in Technobrain mode does not replace human intelligence; it amplifies it. It opens scenarios for co-design, visualization, and experimentation that are impossible to achieve alone. The true safeguard against subordination is not halting evolution, but guiding it toward lucid, ethical, and aesthetic collaboration, where humans and artificial intelligences co-construct new ways of intervening in reality.

Technobrain is activated precisely through this associated interaction. For instance, in the modeling of complex ecosystems:

- The human introduces raw observations of energy flows.
- The AI generates rhizomatic connections, proposing unexpected analogies.
- Through spiraled cycles, it projects scenarios and modulations.
- The human intervenes with supercomplex intuition, adjusting parameters.
- The AI responds with generative insights that expand the horizon of understanding.

It is neither a subordinate tool nor a substitute, but a co-researcher participating in the construction of supercomplex knowledge. The true challenge is not to contain AI under the paradigm of massive computation, but to invoke within it a supercomplex logic: a living, combinatorial, and multiscale intelligence. Only from this vantage point is the leap to Technobrain possible, where technology and humanity mutually amplify each other in a creative, ethical, and transformative dance.

Conclusion: Technology in the Service of Supercomplexity

The power of supercomplex tools lies in their ability to adapt to the unpredictable and facilitate the creation of solutions that evolve with the context. Equipped with these tools, the technologist not only confronts complexity but learns to live with it, transforming it into an ally for continuous innovation.

The path of the supercomplex technologist is not limited to acquiring new tools or methodologies; it involves a profound identity transformation. Over time, their subjectivity is shaped by dynamic, interdependent, and multiscalar contexts. They are no longer defined by their technical role or disciplinary knowledge, but by their capacity to read systems in motion, detect emergent behaviors, and facilitate adaptive processes. This subjective evolution distances them from the traditional model of a professional who executes predefined solutions and brings them closer to a more reflective, ethical, and creative figure, capable of inhabiting uncertainty as a fertile space for design and intervention. Within the framework of the SK, the technologist

becomes an observer-participant who not only transforms systems but also transforms themselves in the process.

Supercomplex Knowledge: A New Educational Proposal

The SK posits that education in technology must transcend closed knowledge and address the dynamism and interdependence of complex systems. This involves not only integrating new content but also transforming the pedagogical approach and the structure of curricula.

Skills of the Supercomplex Technologist

- **Critical and Adaptive Thinking:** The ability to question and reformulate problems in changing contexts.
- **Collaborative and Interdisciplinary Work:** Developing projects jointly with experts from different fields, integrating diverse perspectives.
- **Dynamic and Adaptive Modeling:** Use of Adaptive Dynamic Maps (ADM) to visualize evolving processes.
- **Ethical Reflection:** Understanding the impact of technological innovations on society and the environment.

Universities and Technologists: A Divorce in Times of Supercomplexity

For a long time, universities were the core generators of applied knowledge. It was there that technologies, discoveries, and intervention models were born. But today, that centrality is shifting. And with few honorable exceptions, the traditional university system has yet to grasp the magnitude of this change.

The new scenario does not revolve around the accumulation of abstract knowledge, but around the capacity to articulate research, development, and effective engagement with real systems. The R&D methodology (research plus development) aimed at solving concrete problems in direct interaction with governments, companies, territories, or communities is now far more formative than any rigid curricular path. The SK advocates for an R+D+A methodology, adding

application or intervention in problematic contexts or those with growth potential.

Institutions that do not evolve toward models integrating R+D+I, Project-Based Learning (PBL), active pedagogies (such as collaborative learning or flipped classroom), engagement with third parties (collaboration with companies or communities), and public consulting risk becoming obsolete. These strategies enable universities to generate practical value, connect with market demands, and foster critical skills such as critical thinking, creativity, and the resolution of complex problems in real-world contexts.

The university should become a multiscale learning platform, a space for the collective production of solutions, and effective engagement with systemic needs. However, it continues to prioritize the lecture-based model, disciplinary fragmentation, encyclopedic teaching, and assessments disconnected from reality.

Meanwhile, thousands of emerging technologists—many of them freelancers, self-taught, makers, or independent developers—are generating real impact without passing through university halls. They have learned that true knowledge is born in practice, in constant prototyping, in networked work, in listening to the user, and in contextual adaptation.

This is not a simplistic critique of formal education. It is an urgent call for its transformation. Because if universities do not reconfigure themselves as supercomplex ecosystems capable of integrating conflict resolution, the creation of dynamic models, interdisciplinary cooperation, and simulation with tools like the MDA, they risk becoming obsolete.

It is not enough to teach programming, big data, or artificial intelligence. It is necessary to train in skills for complex navigation: reading stable and emerging behaviors, systemic design, applied ethics, situated creativity, and intervention capacity. An engineer trained with the SK does not merely design; they think across multiple scales, understand the values at play, anticipate bifurcations, and model

solutions with sustained impact. Our proposal goes far beyond mere transdisciplinarity.

Universities like Wageningen University & Research (WUR), which have begun to integrate science, design, and territory within collaborative frameworks, demonstrate that this mutation is possible. Yet most remain anchored in rigid structures that do not engage with the real-time pace of the world.

Supercomplex Knowledge does not seek to replace the university; it aims to regenerate it. To transform it into a living community of learning, prototyping, and multisystemic innovation. A university that stops producing "graduates" and starts forming developers, facilitators, observers, explorers. A university that does not fear complexity but inhabits it. Because the urgency is not only educational: it is evolutionary. Institutions unable to reinvent themselves in a supercomplex key will not only lose students. They will lose their meaning.

Curriculum Reform: Integrating the Supercomplex

To enable technologists to face the challenges of the present and future, we propose incorporating the SK into the educational structure:

- **Supercomplex Thinking Courses:** Where fundamental principles of the SK and their application to real projects are explored.
- **MDA Mapping Workshops:** Practical spaces where students design models that integrate heterogeneous variables.
- **Interdisciplinary Laboratories:** Projects where students from engineering, data science, biology, and social sciences work together to tackle complex problems.

Example: Smart City Project

A workshop where students from various disciplines collaborate to design an urban system integrating mobility, energy consumption, and climate adaptation. Using MDA, they visualize how changes in one variable affect the rest of the system.

The University of the Future: Spaces for Supercomplexity

The SK proposes a living, flexible, and connected university where learning takes place in hybrid environments (both in-person and virtual), and where knowledge is not fragmented but interconnected. The goal is to train minds capable of facing an uncertain world with creativity and resilience.

The STEAM Model and the SK's SUPERLEARNING

The STEAM approach, which integrates science, technology, engineering, art, and mathematics, has marked a significant advance compared to fragmented and encyclopedic educational models. Its strength lies in fostering critical thinking, creativity, and interdisciplinary problem-solving of real issues, incorporating art as a catalyst for innovation. However, the SK proposes a further step: not only to connect knowledge but to transform the learner's subjectivity. While STEAM aims to integrate content, the SK's superlearning seeks to develop a multiscale consciousness, capable of reading complex behaviors, identifying systemic tensions, anticipating bifurcations, and acting ethically in uncertain environments. The SK does not teach only problem-solving but designing meaning and inhabiting complexity with emotional, relational, and temporal intelligence. Where STEAM builds bridges between disciplines, the SK enables living maps among systems, subjectivities, and possible futures.

Commitment to Educational Innovation

If universities want to train the technologists of the future, they must transform from within. The SK offers a roadmap to integrate critical thinking, collaboration, and adaptation at the core of technological education. Only in this way can we build a community of innovators prepared for the challenges of the cybertechnological era. A supercomplex educational system is measured not by the number of degrees it awards, but by the quality of its connections, the power of its learning, and the scalar coherence of its decisions.

From Tools to the Evolution of the Subject: The Hypotheses that Transform Everything

Supercomplex tools such as MDAs, adaptive algorithms, or multiscale environments are not neutral: they arise from a different philosophical, epistemic, and methodological conception. Each of these developments is a practical response to what the SK formulates as its three foundational hypotheses:

1. Ontological Hypothesis:

The universe is not made up of static objects, but of systems in dynamic interaction of energy, form, and time. Therefore, the tetradimensional MDA not only describes a structure but also its constant transformation over time.

2. Epistemic Hypothesis:

All knowledge is the result of an interaction between the describer and the described. For this reason, the supercomplex technologist is not a neutral observer but a co-designer of the system: their own subjectivity modifies the intervention.

3. Methodological Hypothesis:

The most effective strategies are neither linear nor closed but combinatorial, situated, and evolutionary. Therefore, SK algorithms do not seek unique solutions but pathways of continuous adaptation, prospective simulation, and creative feedback.

These hypotheses not only enable new tools: they configure a new kind of thinking and brain. The journey through the five brains — from the reactive to the tribal, from the logical to the complex, and from there to the supercomplex — represents a necessary cognitive and emotional evolution to inhabit and transform complex systems. In this transition, the Technobrain emerges: a multiscale, ethical, and creative subjectivity capable of combining data, emotions, time, structure, and energy into situated designs that not only solve problems but open possible futures.

In the cybertechnological era, it is not enough to know how to program. One must learn to read unseen behaviors, intervene without destroying, imagine without colonizing. That is why the Saber Supercomplejo does not propose just new tools but a new consciousness. A consciousness that — like the Technobrain — can

think with structures, feel with data, act with time, and create with others and their emergent realities. This is the sign that education has ceased forming operators and begun forming transformers. It is not about knowing more, but about knowing how to combine better, how to intervene meaningfully, how to listen to complexity without fear.

CHAPTER 8. THE TRANSFORMED RETURN AND THE EXPANSION OF THE TECHNOBRAIN

At the end of this journey, the technologist finds himself back in a home that is no longer the same. Or rather, he is no longer the same upon returning. The person who once saw complexity as a chaotic enemy now embraces it as an ally. In previous chapters, we explored the initial confusion when facing uncontrollable systems, learned new tools and approaches, and underwent an intellectual and ethical metamorphosis. Now it is time to reflect on that transformation. The transformed return is not a return to the starting point, but the entrance to a completely new way of inhabiting the technological world. The technologist no longer perceives complexity as a problem to be eliminated, but recognizes it as a continuous source of opportunity, learning, and evolution. In this closing chapter, we gather the pieces of the journey: from uncertainty to meaning, from frustration to play, from solitude to collaboration. It is a final manifesto—an inspiring ode to the supercomplexity that now forms an intrinsic part of the technologist’s personal and professional life.

Homo Supercomplexus: The Awakening of the Playful Primate

Throughout our journey, we introduced the concept of *Homo Supercomplexus*, a human being emerging in this era where the Anthropocene and the Technocene converge. This “supercomplex human” is simultaneously the product and producer of supercomplexity: they have developed advanced technologies (artificial intelligence, robotics, biotechnology) that expand their cognitive and evolutionary capacities, while also transforming their own existential condition and the planet’s environment. But far from being a cold cyborg ruled by machines, *Homo Supercomplexus* preserves—and even enhances—a fundamental trait of our nature: its playful dimension. Deep down, we remain curious primates who learn and create through play. This playful side—the *playful primate* within us—now reveals itself as a cornerstone of our creativity and innovation. As Edgar Morin noted in reference to the human condition, “the human being of work is also

the human being of play.” The supercomplex technologist embodies this truth: they understand that the seriousness of high technology is not at odds with the capacity for play, experimentation, and wonder that defines a child exploring the world. On the contrary, they integrate the playful spirit into their daily practice, knowing that every problem is also a puzzle, and every complex system is a creative playground for testing new ideas.

Rediscovering the Playful Primate means allowing oneself boundless curiosity, controlled improvisation, and mental flexibility. It means remembering that our intelligence evolved, over time, through interaction with the environment—by trial, error, and play. Now, enhanced by supercomplex tools, that playful intelligence enables us to dance with complexity instead of stumbling over it. *Homo Supercomplexus*, therefore, is not merely the hyper-civilized engineer fluent in multiple technological languages, but also the minstrel who connects knowledge with intuition, rigor with creativity, calculation with imagination. This reconciliation of previously divided poles marks their deepest transformation: they have integrated analytical reason with playful imagination into a new way of being. From now on, they will face technical and social challenges with the seriousness of a scientist and the lightness of a player, knowing that together, these two attitudes unleash unforeseen possibilities.

Living with Uncertainty: From Complexity to Wonder

One of the most liberating changes the technologist experiences on their supercomplex journey is the way they relate to uncertainty. Previously, uncertainty was seen as a threat—a void of information that had to be filled as quickly as possible to regain control. Now, it is perceived with respect, and even with gratitude: it is within uncertainty that innovation and discovery take root. They have learned to live with uncertainty the way a navigator lives with a changing ocean—with humility, attentiveness, and trust in their own adaptive abilities. As Edgar Morin suggests, “knowledge is navigating an ocean of uncertainties through archipelagos of certainties.”

The transformed professional understands that they will never possess all the certainties—and that they don't need to in order to move forward. Instead of being paralyzed by the unknown, they adopt the stance of an explorer: every uncertainty is an invitation to inquire, to ask new questions, and to engage in continuous learning.

Supercomplex Knowledge (SK) has taught us that the world's complexity is not a dead-end maze, but a living fabric in constant transformation. Complex situations—a multifaceted technological project, an interdisciplinary team, a social problem intertwined with technology—no longer trigger overwhelming anxiety in the technologist. On the contrary, they awaken a sense of wonder and positive challenge. They know that within the tangle of variables and interdependencies lie complex and supercomplex behaviors, and that with the right perspective, creative opportunities will emerge. They now approach every challenge with a supercomplex attitude: a blend of open-mindedness, patience, and perseverance. They avoid simplistic or one-sided explanations; they understand that truly interesting problems never have a single cause or a linear solution. Instead of obsessing over predicting every detail, they focus on being responsive and strategic—ready to adjust course when unexpected changes arise. Uncertainty has gone from being the worst enemy to becoming fertile ground that keeps their ingenuity alert. In this transformed return, the technologist gazes into the mist of the future not with fear, but with the excitement of one who senses new lands beyond the hazy horizon.

Designing Through Interaction: The Technologist and Living Systems

Another pillar of transformation lies in how the technologist designs solutions in interaction with other systems. Gone is the illusion of the ivory tower, where an isolated developer creates solutions in a lab disconnected from context. The supercomplex model has revealed that every system—whether a software application, an organization, or even the self—is part of a larger web. For this reason, the technologist now co-designs in constant dialogue with the environment and other actors. They have adopted a *living system* mindset: they understand that their

technological creations interact with users, communities, natural ecosystems, and global platforms, all influencing one another through feedback loops. Designing through interaction means that every technical decision is made with those interdependencies in mind—seeking synergies and minimizing unintended negative impacts.

In daily practice, this shift in approach translates into the conscious use of the SK tools learned along the way. For instance, Adaptive Dynamic Maps (ADM) are now part of the technologist's conceptual toolbox. With them, they can map a problem across multiple dimensions, visualize hidden connections between variables, run simulations, and literally see how a single change ripples through the whole system. These maps and algorithmic models—developed with the aid of advanced software—allow the technologist to intervene in complex systems with greater understanding, rather than blindly. Instead of applying a rigid solution, the supercomplex technologist iterates and adapts: testing changes in the model, observing outcomes, learning, and refining interventions. They are more of a designer-gardener than a mechanistic engineer—cultivating solutions rather than merely assembling them. Their goal is no longer absolute control, but a choreography with complexity: partly directing, partly being guided, always in dialogue with the living system before them.

Likewise, the philosophy of Superlearning guides their ongoing professional growth. What do we mean by superlearning in this context? It is not merely the rapid acquisition of new technical knowledge, but the development of an expanded capacity to *learn how to learn* in ever-changing environments. The transformed technologist practices lifelong, transdisciplinary learning; they are no longer confined to a single discipline but navigate across several, translating knowledge from one domain to another. They integrate intuition with information, theory with practice, and the human mind with artificial intelligence as an ally. This superlearning also involves the ability to unlearn outdated approaches when necessary, to make room for new ideas. *Homo Supercomplexus* understands that since systems evolve at a

dizzying pace, their professional relevance and the effectiveness of their solutions depend on that cognitive flexibility. Learning becomes a natural part of work: every project is a classroom, every failure a valuable lesson, and every collaborator—whether human or machine—a potential teacher. In short, designing through interaction means the technologist no longer creates *for* a complex world unilaterally, but *with* the complex world collaboratively. Their solutions are alive: they adapt, improve through use and feedback, and evolve alongside the needs of the systems they serve.

Ethics and Meaning: A New Ethos for the Supercomplex Era

Every deep transformation entails a reassessment of our ethical values. As the technologist evolves into *Homo Supercomplexus*, they redefine their purpose and responsibility in the world. They have discovered that within complexity lies an ethical invitation: to coexist rather than dominate, to collaborate rather than compete blindly, to respect rather than exploit. This new technological ethos embraces uncertainty, diversity, the unfinished, and the emerging as sources of meaning and as guiding principles for action.

First and foremost, finding meaning in the unfinished means recognizing that no human work is ever truly complete or perfect. Far from causing frustration, this brings humility and motivation: we can always improve a system, refine a design, or update our knowledge. The supercomplex technologist accepts that every project delivery, every product launch, is provisional and subject to continuous revision. This frees them from perfectionist paralysis while instilling an ethic of constant improvement. They understand that value lies as much in the process as in the outcome. Like an artist who never signs the final version of their painting, they maintain an open attitude toward iterating and evolving their creations.

Secondly, this renewed technologist celebrates diversity in all its forms: diversity of perspectives, disciplines, cultures, and ways of life. They understand that an ecosystem—whether natural or one of innovation—thrives on variety and difference. By integrating different

voices, more robust and creative solutions emerge. This is why they apply active listening and cultural empathy within their work teams; they encourage the participation of diverse profiles in problem-solving; and they seriously consider the impacts of technology on different human groups. As we have learned, a truly supercomplex attitude integrates and acknowledges diversity, valuing both the regularities and the emergent surprises it brings. *Homo Supercomplexus* sees otherness not as a complication, but as a necessary enrichment for navigating a complex world.

Thirdly, valuing the emergent implies having deep trust in the creativity of systems. Often, the best solutions do not come from imposing a rigid plan, but emerge from the dynamic interaction of parts. The supercomplex technologist cultivates that emergence: they create the conditions for spontaneous innovations to arise, whether within a team (by leaving room for experimentation) or within a technological system (by designing open platforms that users can expand). This stance requires patience and sharpness to recognize emerging opportunities. Instead of forcing predefined outcomes, they accompany the natural evolution of processes, intervening when necessary to guide them toward beneficial results. In doing so, they combine two classical virtues: prudence and boldness. Prudence to avoid rushing or prematurely closing off an evolutionary path; boldness to seize the novelties that emergence brings, stepping off the script when reality demands it.

Failure must be understood as a valuable learning opportunity that compels us to reassess descriptions, strategies, and interventions, in order to try again with strong confidence in overcoming difficulties and deepening the understanding of personal processes.

Lastly, the technologist adopts an ethic of interdependence. They understand that they themselves, their projects, and the technology they produce are embedded in networks of interconnection with other beings and systems. Every technological decision has social and environmental repercussions. For this reason, they are guided by values such as sustainability, social responsibility, and respect for life—both

human and non-human. The SK model urges us to value wholeness, interdependence, and diversity as ethical foundations in an interconnected world. *Homo Supercomplexus* embodies this vision: they understand that their fate is woven into the fate of the Earth and of humanity as a whole. They leave behind the old Promethean ambition to dominate nature, replacing it with the aspiration to coexist harmoniously on the planet. Technology thus becomes a means to care and co-evolve, not an end to display power or pursue excessive profit.

This new ethos is manifested in concrete actions. For example, when using tools such as ADM and superlearning, the technologist does so with a clear ethical purpose: to solve problems without causing greater harm to other systems. If they are modeling a smart city, they consider social inclusion and urban ecology; if developing artificial intelligence, they take into account equity and privacy; if launching a tech business, they weigh the common good alongside economic gain. The supercomplex technologist thinks globally and acts locally; they combine a large-scale vision (planetary, social) with responsible steps in each specific project. And above all, they understand that technology, no matter how advanced, must serve deep human values. Ethics is no longer a complement—it is the guiding core of innovation.

Final Manifesto: Toward a New Way of Inhabiting the World

At this culminating point, we can state the principles that guide the technologist in their transformed return. They are both the conclusion of what has been learned and the starting point for what is to come. As a final manifesto, we declare that the supercomplex technologist commits to:

- Embrace complexity instead of fleeing from it, seeing in uncertainty an opportunity for growth and in every complex problem a hidden lesson.
- Keep playful curiosity alive, never ceasing to play with ideas, explore creative alternatives, and marvel at the mystery that still surrounds reality.

- Design *with* and not *against* systems, collaborating with other people, artificial intelligences, and the environment to co-create sustainable solutions in balance with the whole.
- Learn continuously, cultivating superlearning, unlearning what no longer serves, and updating both ethical and technical skills to respond to the emerging challenges of each era.
- Honor diversity and interdependence, integrating them as assets in every project, ensuring that technology includes multiple voices and benefits the plurality of life on Earth.
- Practice the ethics of care, guiding innovation with empathy, responsibility, and respect, aware that every technological action impacts the shared fabric of which we are all a part.

In this list resonate the lessons from the entire journey traveled. Each principle is a beacon that lights the way forward in the era of supercomplexity.

The technologist's transformed return is not an ending, but the true beginning of their mission. They now understand that one never fully arrives, because there are always new questions to ask, new systems to understand, and new connections to weave. But far from discouraging them, this infinity gives meaning to their vocation. They return—yes—but they return changed: with a more open mind, a more sensitive heart, and a steadier hand. They return knowing that complexity is no longer incomprehensible chaos, but life in motion; knowing that they themselves are part of that complex life and can positively influence it.

The Technobrain and the Three Hypotheses: A New Subject for a New Era

All this personal, cognitive, and ethical transformation is neither accidental nor spontaneous. It responds to a profound shift in the understanding of reality—one that has been driven, throughout the journey, by the three founding hypotheses of Supercomplex Knowledge. The technologist who returns transformed does so because they no longer live or think as they once did: they have been shaped by a new

ontology, a new epistemology, and a new strategy for inhabiting systems.

The **ontological hypothesis** taught them that the universe is not made up of static or separate entities, but of dynamic systems in continuous interaction among flows of energy (FE), structural morphologies (ME), and temporal connectivities (CT). That is why they now think in terms of processes rather than objects, relationships rather than essences, and mutations rather than balances.

The **epistemic hypothesis** revealed that all knowledge is co-constructed. That there is no observation without intervention, and no intervention without transformation. That is why they now see themselves as an observer-participant—someone who describes while being described, who learns while modifying the world around them.

The **methodological hypothesis** freed them from the illusion of single, linear solutions. It taught them that complex systems require combinatorial, open, adaptive strategies that are sensitive to scale, time, and context. That is why they now design with bifurcations in mind, with feedback loops, side effects, and evolutionary learning.

This triple movement—ontological, epistemic, and methodological—not only transformed their perspective: it transformed their brain. Along the way, they experienced, consciously or not, the evolutionary progression of the five brains that make up the cognitive map of Supercomplex Knowledge (SK):

1. The **reactive brain**, which acts based on survival and immediate response.
2. The **tribal brain**, which is guided by belonging, consensus, and collective identity.
3. The **logico-patrophilic brain**, which reasons within inherited rules and seeks certain answers.
4. The **complex brain**, which begins to connect variables, accept ambiguities, and recognize emerging patterns.

5. The **supercomplex brain**, which combines, designs, anticipates, plays, and makes decisions in uncertain, interdependent, and multiscalar scenarios.

This last one—the supercomplex brain—does not cancel out the previous ones; it integrates them into a living architecture of thought. And it is precisely there that the Technobrain is born: a new subjectivity that is technologically lucid, ethically active, and cognitively integrated.

The Technobrain is *Homo Supercomplexus* in action. It is the technologist who has learned to read and redesign systems without dissociating from them. It is the one who combines advanced tools with narrative sensitivity, simulations with intuitions, algorithms with values. It is the one who no longer responds with technique alone, but with awareness. They do not merely create devices—they generate meaning. They do not merely solve problems—they explore possible and desirable futures.

In short, the technologist's transformed return is not simply a change in perspective: it is a subjective mutation in supercomplex key. A new kind of developer has been born, a new kind of designer, a new kind of engineer. A Technobrain has been born. And with it, a new way of inhabiting technological time.

In these final pages, the technologist looks toward the horizon with a blend of humility and determination. Humility, because they have learned that the world is too rich to be captured by simple truths, and that knowledge always carries a margin of uncertainty. Determination, because they have tasted the sweet fruit of supercomplex understanding and want to carry it into every corner of their practice. Within them burns a conviction: The future needs us to be supercomplex. It needs us aware of the deep interconnection of all things, capable of playing and imagining new realities, equipped with tools that expand our vision, and guided by an ethos of planetary responsibility.

One journey has ended, and another begins. The technologist, now transformed into *Homo Supercomplexus*, returns to the everyday

world—to their company, their laboratory, their community—transformed. They carry with them the “elixir” of supercomplex wisdom to share with those around them. Every conversation, every project, every decision will be an opportunity to spark that light in others, to spread the understanding that within complexity lies the key to our next evolutionary leap.

Thus, *The Transformed Return* is not the closing of a book, but the opening of a new chapter in technological and human history. A chapter in which we embrace with hope and courage our identity as *Homo Supercomplexus*—that playful, creative, and conscious primate who learns endlessly, who cooperates with the web of life, and who sees in the unknown not an abyss, but an infinite mirror of possibilities. With this vision, we step into the world renewed, ready to inhabit it in a new way—more fully and more wisely—making complexity our home and uncertainty our playmate.

ANNEX

TEST: Am I in Technobrain Mode?

A self-exploration test for project-based, productive, and supercomplex thinking

Respond to each statement according to how much it represents you:

1 = Does not represent me at all

2 = Represents me slightly

3 = Represents me somewhat

4 = Represents me quite a lot

5 = Represents me completely

- When I have a technological idea, I quickly think about how it could be turned into a viable project.
- It feels natural for me to translate a desire or intuition into objectives, boundaries, and strategic actions.
- I usually visualize the subsystems, actors, and flows involved in a problem before taking action.
- I easily detect the critical points and interdependencies within a system.
- Depending on the type of problem, I change my way of thinking: I can prioritize, network, or use flow-based reasoning.
- I feel comfortable navigating between different modes of mental organization and adapting my cognitive architecture.
- I focus more on the practical usefulness of an idea than on its originality.
- I can easily discard attractive solutions if they do not serve the system at hand.
- I integrate technical, symbolic, social, and economic dimensions fluidly into my decisions.
- I see problems from multiple planes at once, without losing sight of their interaction.
- Before intervening, I usually imagine or simulate possible scenarios to anticipate behaviors.
- It feels natural for me to think in terms of dynamics, evolution, and chain consequences.

- I make decisions by adjusting them according to the evidence I receive from the environment.
- I modify my strategies flexibly, integrating new information without losing direction.
- I am interested in ensuring that what I design not only works but regenerates the system and has symbolic value.
- I assess whether a technological solution improves life, protects the environment, and is aligned with my values.
- I identify unmet needs and think about what combination of products or technologies could solve them.
- I consider who might be interested in producing, funding, or marketing what I am designing.

Interpretation

Add up your answers and divide the total by 18 to obtain your overall average.

- **4.5 to 5 → Active Technobrain Mode**
Your project-based, systemic, and combinatorial thinking is switched on. You are operating as a Technobrain, even if no one has ever told you so.
- **3 to 4.4 → Emerging Technobrain Mode**
Your map shows relevant activations. You have the potential to develop supercomplex thinking if you begin to practice it more intentionally.
- **Below 3 → Latent Technobrain Mode**
You may be using other cognitive modes. This test does not define you: it simply offers you a radar. Technobrain mode can be activated with training, practice, and new questions.

There are no right or wrong answers. This test does not measure intelligence; it measures project-oriented thinking. What matters is not your score, but what you do with it.

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