

COMPLEMENTARY NOTES

*Complementary Notes
on Processual Ontology*

David Bories

Tried by the Flow — A Processual Ontology of the Datum, continuity volume
Complementary Notes on Processual Ontology

Conceived and directed by David Bories — Albi, France.

Written using generative artificial intelligence.

Translation produced by generative artificial intelligence, under the supervision of the author.

October 2026.

Aligned with the second edition of the trilogy.

First version: July 2026.

Version 0.10.0-en, pocket format.

© David Bories, 2026. Released under the Creative Commons Attribution 4.0 International licence (CC BY 4.0). Any use, including commercial use, is permitted provided the author and the source are credited.
<https://creativecommons.org/licenses/by/4.0/deed.en>

The full text of this volume and of the whole corpus is freely available at <https://artisanat-de-la-donnee.fr>

Table of Contents

Code Displaced, Not Erased	1
<i>AI, the Developer, and the Canal That Silts Up in Silence</i>	1
Preamble — Status of This Text	1
What the Developer Does, and What AI Does	2
The Move Is Not New: It Is Only One More Notch	2
The Canal That Silts Up in Silence	3
The Privilege of the Few — a Recurring Pattern	3
Why This Is Consistent with the Systemic Leap of the Essay	4
A Posture, Not a Recommendation	4
Conclusion — A Grid, Not a Verdict	5
Landmarks	5
The LLM as a Systemic Leap in Storage	7
<i>Three Roles in One — and What the Fusion Abolishes</i>	7
Preamble — Status of This Text	7
Three Historically Distinct Roles	7
The LLM, Fusion of the Three — and Transformation of Each . . .	8
What the Fusion Abolishes	9
Why This Is a Systemic Leap in the Sense of the Essay	10
A Posture, Not a Recommendation	10
Conclusion — A Grid, Not a Verdict	11
Landmarks	11
The Instruction-Driven Function	13
<i>The LLM as a Systemic Leap in Data Processing</i>	13
Preamble — Status of This Text	13
What a Program Knew How to Do with a Text	14
The Instruction-Driven Function	14
Three Regimes, Three Statuses of the Datum Produced	15
Representation Follows the Tool	16
The Case of Message Qualification	16
What the Function Makes Flow More Easily	17
Why This Is a Systemic Leap	18
What Must Be Held	19
Conclusion — A Grid, Not a Verdict	19

Landmarks	20
Adapting to the Torrent	21
<i>Gamification, between the Acceleration of Reading and Discernment</i>	21
Preamble — Status of This Text	21
Gamification as a Systemic Leap in Reception	22
The Loop: Reading and Content Adapt to Each Other	22
Reading Fast Is Not Reading More	23
Disinterest, the Neglected Datum and the Dead Datum	23
The Other Face — Gamification in the Service of Discernment	24
A Posture, Not a Recommendation	25
Conclusion — A Grid, Not a Verdict	25
Landmarks	26
The Bearer Datum and the Borne Datum	27
<i>Existential Dependence between Data</i>	27
Preamble — Status of This Text	27
A Datum That Exists Only through Another	27
Shared Fate, and Not Mere Reference	27
Reference: a Link That Does Not Tie Existence	28
What Must Not Be Seen in It Either	28
Landmarks	28
Armature: the Canal Dug in Stable Sources	31
<i>The Conventional Data That Structure an Activity</i>	31
Preamble	31
The Armature Is Made of Data	31
Drawn from Stable Sources	31
Construction without Invention	32
No Outside-the-Flow: the Armature Drifts Too	32
Standardization, the Condition of Interoperability	32
The Canal-Keeper's Task	33
Landmarks	33
The Envelope: Quality as the Tending of the Agreed	35
<i>The Support Process That Describes the Armature and Makes It Transmissible</i>	35
Preamble	35
The Envelope That Describes Its Content	35
A Stable Source of a Particular Kind: Intended Stability	36
A Support Process	36
A Collective Tending	36
Safeguard on Form	37
Landmarks	37
Designing a Project in the Light of Processual Ontology	39
<i>The SASactiv Case</i>	39
Preamble — Status of This Document	39
Part I — Why a Forward-Looking Case	40

Part II — The SASactiv Project in Brief	41
Part III — Reading through the Three Phases	41
Part IV — Four Axes That the Case Sheds Light On	44
Part V — Limits and Open Questions	46
Conclusion — The Grid as a Design Tool	47
Appendix — SASactiv Project Sheet	48
Landmarks	52
Locating Oneself in the Noise of the World	53
<i>The PPE Case — Positioning by Signal Fingerprint</i>	53
Preamble — Status of This Document	53
Part I — Why a Second Forward-Looking Case	54
Part II — The PPE Project in Brief	55
Part III — Reading through the Three Phases	56
Part IV — Four Axes That the Case Sheds Light On	58
Part V — Limits and Open Questions	60
Conclusion — The Grid as a Design Tool	61
Appendix — PPE Project Sheet	61
Landmarks	62
Data Literacy — State of the Field	65
<i>Genealogy, Frameworks, Actors, Tensions: the Field in Which the</i> <i>Trilogy Took Its Footing</i>	65
Part I — Literacy: a Long Genealogy	65
Part II — The Birth of Data Literacy	66
Part III — Theoretical Foundations	68
Part IV — Data Literacy as a Boundary Object	70
Part V — The Institutional Frameworks	70
Part VI — The Ecosystem of Actors	71
Part VII — Objectives, Tensions, Stakes	72
Part VIII — Permanent Reconfiguration	73
Conclusion — An Alphabet Being Written	74
Landmarks	75
Methodological Note — Statements Open to Refutation	77
Why This Note	77
The Statements	77
How to Read a Refutation	78
Translation choices	78

Code Displaced, Not Erased

AI, the Developer, and the Canal That Silts Up in Silence

Note on the translation — This translation re-fixes the source text without displacing its substance. A few terms of the corpus have no obvious equivalent in English; the choices made, and how they are to be read, are set out in the section “Translation choices” at the end of the volume. This translation is not frozen: it will evolve with readers’ feedback and with the improvement of the means of translation. The French version is authoritative.

“The container that changes its nature does not abolish the gesture: it moves it up a notch.”

Preamble — Status of This Text

This text does not belong to the essay *The River and the Canal*, Tome 1 of the trilogy *Tried by the Flow*. It is a brief extension of it, designed to keep a concise record of a reflection carried out on the margins of the writing: *does AI replace the developer, or does it move the developer’s gesture — and if it moves it, what does it fill in silently?*

The answer defended here is: AI does not abolish the developer’s craft; it moves its exercise up a notch towards natural language — exactly as digital technology moved paper without erasing it. But this move silently fills in a particular canal of the craft, low-level development, where humans still tell the machine, *in hard-coded terms*, how to behave. And it is in this filling-in, not in replacement, that the civic stake lies.

The text does not claim to cover the subject. It sets out the conceptual grid that makes it possible to come back to it, when the time comes, without having to rebuild everything. It is addressed to a reader already familiar with the notions of the essay — notably that of the systemic leap (doc 6,

Part VII), that of the canal that an intention digs (doc 6), and that of literacy as a civic competence (doc 6, Part VIII).

What the Developer Does, and What AI Does

The fear is voiced everywhere: *AI produces code on demand; soon it will replace those who used to write it.* The observable form proves it right. AI generates code; the developer, for their part, provides instructions in natural language. The gesture seems to have changed hands.

But this gesture must be looked at for what it is, without resentment or nostalgia. Giving a machine instructions so that it carries out a task — that is precisely the definition of *code*. Prescribing in natural language to a model the sequence of tasks that must produce an expected result is not having stopped coding: it is coding in another register, at another level of abstraction. The developer who instructs AI does not leave their craft; they exercise it one notch higher.

The essay established the pattern: the systemic leap is not assessed by what it makes faster or more convenient, but by what it *moves*, by what it makes possible and by what it makes obsolete. Digital technology moved paper without killing it — paper subsists where its permanence remains precious. Cinema moved photography without killing it. In the same way, AI moves code without erasing it: what AI produces *is* code, and what the developer produces *remains* code — simply moved up a notch towards language.

The Move Is Not New: It Is Only One More Notch

The move towards abstraction did not begin with AI. It has been, from the origin, the movement proper to the craft.

Most of the code written today is *interpreted* code: it does not speak directly to the machine. It goes through an intermediate program that converts it into executable instructions — a language less natural than speech, but manageable enough to be written and read with ease. The developer who writes in a high-level language already no longer tells the machine, *in hard-coded terms*, how to behave: they entrust this translation to an intermediate layer that does it for them.

AI, in this sense, only adds one notch to an already old staircase: from machine language to compiled language, from compiled to interpreted, from interpreted to instruction in natural language. Each step has moved humans further away from the real functioning of the machine, and each step was experienced, in its time, as a liberation as much as a loss. The developer's craft is not erased at each step: as long as there are projects,

a code — in the broad sense — will have to be produced so that a machine links tasks together and obtains the expected result.

The Canal That Silts Up in Silence

What is erased is therefore not the craft. It is a **branch** of the craft, a particular **canal** that one gradually ceases to dig: low-level development, where the developer is really able to tell the machine how it must behave; where what humans expect of the machine is inscribed, *hard-coded* and inaccessible to the machine itself.

This canal does not disappear by decree. It silts up in silence, because it becomes useless to the greatest number, and what is no longer useful to the greatest number ceases to be tended, transmitted, learned. Know-how does not die out all at once: it becomes rarer, concentrated, reserved.

And it is here that the reflection tips from the technical to the civic. One hears, in the media and in discussions, the fear that AI will take control — through delegation by humans — of the understanding of data. If this fear has a foundation, it is perhaps exactly here. For who, today, in public debate, understands low-level development well enough to assert that the machine remains under control? Without putting an exact figure on it: not many people. People speak of something they do not really know. The fear is not irrational; it is the confused perception of a canal silting up out of sight of the greatest number.

The Privilege of the Few — a Recurring Pattern

The history of the devices for storing and processing knowledge has already known this movement. When reading was reserved for a caste, knowing how to read was a power — and this power constrained those who were deprived of it. When the mastery of writing, of calculation, of law, of figures was concentrated in few hands, this concentration marked out, each time, a dividing line between those who understood the device and those who had to rely on them.

Mastery of the level where one tells the machine, *in hard-coded terms*, how to behave could be the contemporary form of this privilege. Not because some will decided it, but because the silent silting-up of a canal mechanically produces an asymmetry: a small number keeps access to the level where the machine's behaviour is really decided; the greatest number now interacts only with the upper layers, in natural language, with no means of checking what is at play below.

Is it inevitable? It is not impossible — but it is not written. A privilege is a constraining power only as long as it remains out of collective reach. What

has been named can be discussed; what is discussed can be regulated; what is regulated ceases to be an opaque privilege. The fear is lifted not by denying the asymmetry, but by integrating it from now on into civic participation: deciding, for the future, who must understand what, and on what conditions, so that no doubt remains about who really controls our understanding of data. About who governs.

Why This Is Consistent with the Systemic Leap of the Essay

The essay defines the systemic leap as a change of nature, through the crossing of a threshold, and invites us to measure it not by what it accelerates, but by what it makes possible and what it makes obsolete.

Applied to code: what becomes possible is prescribing a machine's behaviour in natural language, without going through the low layers. What becomes obsolete is not the developer's craft — it moves; it does not die out — but the spontaneous tending, by the greatest number, of the low-level canal. The leap does not abolish the gesture of coding; it moves it up a notch and, in doing so, leaves behind it a canal that one ceases to dig without noticing.

It is the same movement as the one described elsewhere for the LLM as a systemic leap in storage: what the transformation abolishes is not access — access improves — but a *condition of control* over this access. Here, the condition of control is the distributed competence to understand the level where the machine's behaviour is decided. The leap does not destroy it; it makes it optional for the greatest number — and what becomes optional ceases, for want of use, to be kept up.

A Posture, Not a Recommendation

The essay does not prescribe. It sheds light — it invites us to see the leap for what it is and to keep its transformative dimension in mind. The present text does nothing else.

Identifying the displacement of code does not suggest that AI should be refused, nor that low-level code should be mourned as a lost golden age. It suggests that the canal that is silting up must be **named** — precisely so that people stop believing that “AI replaces developers” (it moves their gesture) and so that they see what the move leaves behind: not a dead craft, but a competence of control that, for want of being tended collectively, becomes concentrated in few hands.

Digital technology moved paper without killing it — on condition that it was

tended where its permanence remains precious. AI moves code without killing low-level development — on condition that it is recognized as distinct from generated code, and that it continues to be transmitted where mastery of the machine's behaviour remains a matter of government, and not only of technique.

The danger is not that AI produces code. The danger is that it makes people forget the canal it moves — and that this canal, for want of being named, ceases to be kept up by a competence distributed widely enough for us still to be able to answer, collectively, the question: *who governs the machine's behaviour?*

Conclusion — A Grid, Not a Verdict

This grid — *code displaced, not erased, and the low-level canal that silts up in silence* — does not exhaust the subject. It sets out one side of it, which complements what the essay already says about displacement (paper, cinema) and about literacy as a civic competence of control (doc 6, Part VIII).

This grid makes one thing possible: *speaking about AI and the developer's craft without depending on the state of the tools at a given moment*. What is true in May 2026 — such a model generates such a language with such reliability — will be obsolete before the end of the decade. What will remain true: that prescribing a behaviour to a machine is a gesture of code at whatever level one exercises it; that this gesture has always moved towards abstraction; and that each move leaves behind it a canal of control that, if it is not named and tended, becomes the silent privilege of a few.

This, in a few words, is the substance that must be held. For the rest — which levels should be taught, to whom, on what conditions, under what regulations —, it is for each reader, in their context, and for collective deliberation, to make the chart.

Landmarks

For the conceptual foundation of the systemic leap, see the trilogy *Tried by the Flow*, Tome 1, *The River and the Canal*, document 6 (*Digging the Canal*), Part VII — “The Systemic Leap”.

For literacy as a civic competence of control over the flows that are presented to us as “reality”, see the same document, Part VIII — “What the Flow of Observation Brings to Literacy”, and its conclusion on the *data-literate* citizen.

For the pattern of the articulation between distributed human intelligence and artificial intelligence — AI as an instrument in a chain where humans keep the responsibility of intention —, see the same document, Part V (“The Dynamics: Flows That Engender Flows”), section “A Distributed Architecture of Models”.

For the complementary angle of the LLM as an entity that condenses three roles and transforms the nature of each, see the note *The LLM as a Systemic Leap in Storage — Three Roles in One, and What the Fusion Abolishes*.

On the way in which a mutation of the devices for storing and processing knowledge transforms the society that relies on them, and redistributes access to a knowledge long reserved: one will read with profit Walter Ong (*Orality and Literacy*, Methuen, 1982; French translation *Oralité et écriture*, Les Belles Lettres, 2014) and Elizabeth Eisenstein (*The Printing Press as an Agent of Change*, Cambridge University Press, 1979).

Text written in May 2026, to be tested by practice.

The LLM as a Systemic Leap in Storage

Three Roles in One — and What the Fusion Abolishes

“When the container changes its nature, the content is no longer the same.”

Preamble — Status of This Text

This text does not belong to the essay *The River and the Canal*, Tome 1 of the trilogy *Tried by the Flow*. It is a brief extension of it, designed to keep a concise record of a discussion that took place on the margins of the writing: *can the LLM (large language model) be thought of as a systemic leap in the sense in which the essay uses this notion?*

The answer defended here is: yes, on condition of locating precisely which parameter the leap concerns, and what its occurrence moves in the organization of human knowledge. The text does not claim to cover the subject; it sets out the conceptual grid that makes it possible to come back to it, when the time comes, without having to rebuild everything.

It is addressed to a reader already familiar with the notions of the essay — notably that of the systemic leap (doc 6, Part VII) and that of processual literacy of the datum (doc 6, Part VIII).

Three Historically Distinct Roles

Before the LLM, access to stored knowledge rested on the cooperation of three distinct roles, sometimes embodied in three persons, sometimes in three institutions, sometimes in three moments of one and the same work.

The library — in the broad sense: any device for preserving and classifying texts, data, works. The scroll of Alexandria, the monastic scriptorium, the great national library, the digital archive, the search engine. Its function is to *keep* and to *shelve*, according to a system that makes the items findable.

The librarian — in the broad sense: any agent who knows how, faced with a request, to find the relevant item in the library. The expert who remembers, the indexed catalogue, the scientist who knows where to look, the search algorithm. Its function is to *retrieve* — to take the request through the classification system to the item sought.

The storyteller — in the broad sense: any agent who renders to the user the content retrieved, in an intelligible form. The reciter, the person reading aloud, the author who summarizes, the journalist who popularizes, the teacher who explains. Its function is to *render* — to take the content through language to the user.

These three functions have always been distinguished — including when they were embodied by the same person. The copyist monk *shelved* the manuscript in the scriptorium, *looked for* it at the abbot's request, then *read* it aloud during the offices: three acts, three moments, three responsibilities. This distinction was not a convenience: it was constitutive of the human relation to stored knowledge.

The LLM, Fusion of the Three — and Transformation of Each

The large language model condenses these three roles into a single entity. One asks it a question; it “answers” — and in this single operation, it stands in at once for library (knowledge is stored in it), librarian (it retrieves the relevant part of it) and storyteller (it renders its content in understandable language).

At first sight, it is an integration of functions — efficient, convenient, unprecedented. But the systemic leap is not in the integration. It is in the fact that **each of the three roles, integrated with the other two, changes its nature.**

The library no longer shelves books. It *compresses* its training corpus into the weights of a neural network. The initial texts are no longer present as such; they have been melted into a statistical representation of their regularities. One cannot extract from the LLM an intact copy of a source text: one can only obtain a probable paraphrase, sometimes faithful, sometimes not, with no internal means of telling which.

The librarian no longer consults a catalogue. It *generates* its answer by probabilistic calculation on the weights. It does not go and look for a

given item in a given place; by passing the request through the model, it produces an output that *resembles* what a librarian with access to the complete corpus would have said. The operation “retrieve” becomes “simulate retrieval”.

The storyteller no longer reads a text. It *synthesizes* text that resembles what the corpus could have produced on the question asked. It does not have an original before its eyes; it has a probabilistic function that produces, word after word, what is statistically verisimilar after the previous word.

What happens with the LLM is therefore not an integration: it is a **simultaneous transmutation of the three functions**. And it is this transmutation, and not the integration itself, that makes the systemic leap.

What the Fusion Abolishes

The user of an LLM gains time, gains comfort, gains access. But they lose, at the same time, what the separation of the three roles guaranteed them without their realizing it.

The return to the source. The library made it possible to go back to the book as it was written; the LLM does not. When one doubts a paraphrase, one can open the book. When one doubts an LLM’s answer, one can only, inside the system, regenerate it — often obtaining a different answer, with no way of knowing which is right.

Traceability. The librarian could say: “*I consulted such a work, at such a page*”. The LLM, by construction, generally cannot: its answer has no internal location; it is the combined effect of all the weights, and no architectural mechanism preserves a citation trail. External devices (RAG, annotated sources) can partly restore this function, but they are supplements, not the very nature of the model.

The legibility of the classification system. One can criticize the Dewey decimal classification; one can propose another indexing; one can understand why a given book is shelved there rather than elsewhere. The weightings of a model are not legible in this sense. They are, for the user, opaque — and even for those who trained them, their detailed functioning remains largely obscure.

The possibility of disagreeing with the classification. In a library, I can contest a classification, ask for a revision, write a letter to the librarian. With an LLM, I can only contest the answer downstream; I cannot say “this content should be weighted differently in the model”. The shelving cannot be touched from outside.

Separation as a counter-power. When library, librarian and storyteller are three persons or three institutions, their possible disagreements act as

a mechanism of control. The librarian can refuse to hand over a work they judge inappropriate. The storyteller can disavow a reading they would have been forced to make. This plurality of roles is, structurally, *a democratic device of temperance*. The LLM abolishes it, because it integrates the three roles into one and the same calculation.

This last loss is, in the last analysis, more political than technical. It does not come from a defect of the LLM that could be corrected; it comes from the very nature of integration. This is what the fusion of the three roles abolishes: *not an incidental detail, but a structural condition of counter-power over stored knowledge*.

Why This Is a Systemic Leap in the Sense of the Essay

The essay defines the systemic leap as a change of nature, through the crossing of a threshold, in the way a flow of observation is built. Cinema is not a faster photograph: it is another medium. The instantaneous push notification is not a faster message: it is another regime of synchrony.

In the same way: the LLM is not a more efficient library, nor a faster search engine, nor a more available assistant. It is the fusion of the three into an entity where each function has changed its nature. And this fusion changes the human relation to stored knowledge — not because it improves access, but because it abolishes the separation of roles that made this access *controllable*.

This is exactly what the systemic leap implies: the leap is not measured by what it makes faster, more efficient or more accessible. It is measured by what it makes possible and which did not exist, and by what it makes obsolete and which seemed established.

What becomes possible with the LLM: almost immediate access, in natural language, to a plausible synthesis of what billions of pages have said on any subject. What becomes obsolete: the separation of roles, and with it traceability, criticism, the return to the source, counter-power.

A Posture, Not a Recommendation

The essay does not prescribe. It *sheds light* — it invites us to see the leap for what it is, and to keep its transformative dimension in mind. The present text does nothing else.

Identifying the LLM as a systemic leap in storage does not suggest that it should be rejected, nor that it should be undergone. It suggests that it should be **named** — precisely so that people stop confusing it with what

it is not (a library, a librarian, a storyteller) and can measure the consequences for what it transforms.

Cinema moved photography without killing it. The push notification moved mail without killing it. The LLM moves access to knowledge, without killing the library, the librarian, the storyteller — on condition that they have been recognized as distinct from the LLM, and that they continue to be tended where their separation remains precious.

The danger is not that the LLM exists. The danger is that it makes people forget the separation of roles that it integrates — and that this separation, for want of being named, ceases to be kept up by the institutions that were in charge of it.

Conclusion — A Grid, Not a Verdict

This grid — *three roles in one, and what the fusion abolishes* — does not exhaust the subject. It sets out one side of it, which complements what the essay already says about LLMs in doc 6 (a frozen corpus that produces verisimilitudes). The angle “systemic leap in storage” and the angle “literacy about AI” do not contradict each other: they shed light on the same thing from two points of view.

This grid makes one thing possible: *speaking about LLMs without depending on their technical state at a given moment*. What is true in May 2026 — models with such a number of parameters, such capacities, such limits — will be obsolete before the end of the decade. What will remain true: that an LLM, in its principle, is an entity that condenses three historically distinct roles, and that this condensation transforms the nature of each.

This, in a few words, is the substance that must be held. For the rest — when, in which uses, on what conditions, with what regulations —, it is for each reader, in their context, to make the chart.

Landmarks

For the conceptual foundation of the systemic leap, see the trilogy *Tried by the Flow*, Tome 1, *The River and the Canal*, document 6 (*Digging the Canal*), Part VII — “The Systemic Leap”.

For the frozen status of the corpora that feed an LLM and the arbitration between training and access, see the same document, section “A Distributed Architecture of Models”.

For the competence of discernment of the master artisan faced with LLMs, see the *Competency Framework of the Data Artisan* (a craft yet to be cre-

ated), competence 22 — “Recognizing the nature and age of the corpora that feed an AI model”.

On the historical transformation of the relation to stored knowledge: one will read with profit Walter Ong (*Orality and Literacy*, Methuen, 1982; French translation *Oralité et écriture*, Les Belles Lettres, 2014) and Elizabeth Eisenstein (*The Printing Press as an Agent of Change*, Cambridge University Press, 1979). These two works, earlier than digital technology, remain the references on the way in which a mutation of storage devices transforms the society that relies on them.

Text written in May 2026, to be tested by practice.

The Instruction-Driven Function

The LLM as a Systemic Leap in Data Processing

“The data representation must be chosen with due regard to the transformation to be achieved and the data processing tools available.”

— Peter Naur, 1968

Preamble — Status of This Text

This text does not belong to the trilogy *Tried by the Flow*. It is a brief extension, which answers a question of practice: *what changes, in the processing of data, because a program can call a language model?*

The answer defended here is the following. The program now has at its disposal a function of a new kind, which this note calls the **instruction-driven function**: it receives a text and an instruction written in natural language, and its behaviour is fixed, at each call, by this instruction. It greatly lowers the cost of moving from one representation to another, and it makes the prose written for human readers processable by a program. In return, the guarantee of the result changes its nature: it no longer comes from the construction of the program; it is measured. It is this change of nature that makes the instruction-driven function a systemic leap in processing.

The text complements two neighbouring notes. *Code Displaced, Not Erased* deals with the model that writes the program; *The LLM as a Systemic Leap in Storage*, with the model as a stock where one goes to look for knowledge. Here, the model is called by the program, on the data, at the moment they are processed. The first tome (*Digging the Canal*, Part VII) attaches to the leap in storage operations such as qualifying a text or converting the format of a datum; the present note looks at these same operations from the program that calls them.

As in chapter 10 of *The Canal and the Workshops*, the language model is treated here as a dated illustration, not as a concept of the trilogy. “Instruction-driven function” names a use; the concepts called on are those of the essay: systemic leap, derived datum, filiation, provenance, situated position of handling or processing.

What a Program Knew How to Do with a Text

A program handles values of defined types — integers or decimals, dates, Booleans, texts, lists — by means of operations whose meaning is fixed once and for all. Two numbers are added, two dates are compared; a text is split, concatenated, measured, searched for a string of characters. Type conversion takes a value from one type to another, on condition that it comes in the expected format: the string “42” becomes the number 42; the string “forty-two” raises an error.

In memory, everything is coded in binary, and text is only one coding among others. But any datum can be written as text and read back: exchange formats (JSON, CSV, dates in ISO format) serve this purpose, and most exchanges between systems go through text. This is what gives its reach to a function that operates on texts: it reaches almost all data, provided one knows how to write them and read them back.

On a text, the classic operations see only the form, that is, characters. To process a text according to what it expresses, one had to take one of two routes. The first consists in making it enter, from the moment it is input, a planned format: a form, a list of codes, separate fields. The second consists in writing a program dedicated to one task: a term register that approaches the content through marker words, a parser for a particular format, or a statistical model trained on labelled examples for a single classification. Each task required its program, and each new category new rules or new examples. The first tome says of these operations that they required “a dedicated process, that is, someone who read, judged, reformulated”. On the side of programs, this dedicated process was a set of rules or a specialized model.

The Instruction-Driven Function

With a language model, the program passes on a text and an instruction, and receives a text in return. The instruction describes the operation: classify the text into one of these categories, extract its due date, rewrite it in such a format, summarize it, translate it. The behaviour of the function is not fixed in advance: it is given at each call.

This is what distinguishes it from the operations of the programming language. An addition always does the same thing; the instruction-driven function does what the instruction asks of it. It resembles less one more operation than an interpreter of instructions, and it is for this reason that a single function can replace many dedicated programs.

Current interfaces make it possible to constrain the answer to a schema: a closed list of categories, a record with its fields, a date in the expected format. The form of the result is then guaranteed; its exactness is not. The function thus extends type conversion to texts that do not come in the planned format: a date written out in words, an address typed in one piece, an amount taken from a sentence.

It does not replace the classic operations for all that. The model does not read characters but fragments of words; it counts letters badly and calculates badly on long numbers. It is added to length measurement, splitting and addition without being substituted for them. The size of the texts it accepts is bounded, and its reliability falls in rare languages and specialized notations.

A neighbouring function complements the first. An embedding model transforms a text into a sequence of numbers; comparing two of these sequences gives a graded proximity between the texts, where equality compares only characters. For classifying or searching, this comparison is often less costly and more stable than a call to the language model.

In this use, the model occupies a situated position of processing: it processes, classifies, relays. The trilogy does not settle the question whether a meaning is actualized for it, and this note does not write that the model understands the text it receives.

Three Regimes, Three Statutes of the Datum Produced

The operations entrusted to the instruction-driven function do not all have the same relation to the input text. The lexicon of the second edition makes it possible to situate what they produce.

Formatting. The content is already in the input; the result gives it in another form: a date in words becomes a normalized date, a free-form address becomes fields. If the declared invariants are preserved, the lexicon sees in it a faithful conversion, that is, a new occurrence of the same datum; the operation and the source text are inscribed in the provenance.

Reducing. Extracting, classifying, summarizing: the result is taken from the input and is checked against it. Classification and summary are transformations; their result is a derived datum, which opens a filiation and whose provenance includes the model and the parent text.

Adding. Completing or enriching from what the model has learned: a

missing postcode, a probable sector of activity, a piece of context information. The result contains what the input did not contain; it is taken from the stock condensed in the weights of the model, the one described by the note on the leap in storage. It is akin to the verisimilar datum of the lexicon, guaranteed by a model and not by the real. It is in this regime that errors with the appearance of data are born.

These regimes overlap with the typology of chapter 10 of *The Canal and the Workshops*. The first two work on a supplied material and remain close to the uses that are neutral with respect to the fusion; the third draws on the hidden stock and belongs to the risky uses. As soon as the results circulate and feed decisions, the use also enters the class of uses that require restoration: this is the object of the part “What Must Be Held”.

Representation Follows the Tool

Peter Naur, who in 1966 proposed the word *datalogy* to designate the science of the nature and use of data, set out its fundamental principle in 1968: the representation of data must be chosen according to the process to be carried out and the processing tool available. Naur’s radio lectures of 1967 gave an example of it. Engineers and architects worked on technical plans, a well-chosen representation as long as processing was done by humans, with their eyes and their minds; the computer changed the tool, and therefore the representation that was suitable.

The instruction-driven function changes the tool again. Prose, the representation chosen for human readers, becomes processable by a program without prior formalization. Emails, minutes, comments, transcriptions, free fields of forms: these data were constituted, accessible, intelligible for their readers, but a program could process them only after they had been rewritten in a planned format.

The model, for all that, does not make the text a datum. An email is a datum constituted by the act that inscribed it; its existence owes nothing to reading, nor to processing. What changes is its processability by a program, that is, part of the conditions of its resumption.

The Case of Message Qualification

Qualifying a message is placing it in a category: complaint, request for a quotation, cancellation. The case shows where the change lies.

Before, one kept a term register for each category. Counting the terms of the register present in a message made it possible to estimate the probability that it belonged to the category. The register had to be built, then tended: new words appear, usages change, a new category requires a new

register. The other route, a statistical classifier, required labelled examples and a new training at each change.

With the instruction-driven function, the categories are named and described in the instruction, the answer is constrained to their list, and the messages for which confidence is low go into a manual processing queue. Adding a category amounts to modifying the instruction.

Two clarifications prevent the gain from being misplaced. It does not lie in computing time: looking for terms in a text is very fast and depends little on the size of the register, whereas a call to the model takes from a fraction of a second to several seconds and costs money and energy. It lies in human work, which no longer has to tend the list of marker words, and in coverage: the model also handles paraphrases, negations, typing errors and other languages. As for confidence, the model does not provide a calibrated probability. A score requested in the instruction is a declared score, generally overconfident. One can rely on the probabilities that some interfaces associate with the answer, or on the agreement between several calls. In all cases, the threshold that sends a message to the manual queue is set on a sample already classified by hand, where the error rate is measured.

Tending changes its object. One no longer tends the words that signal a category, but the list of categories and their definition: the agreed, in the sense of the note on the envelope. To this are added the evaluation sample and the threshold. The model classifies; those who wrote the instruction, chose the categories, set the threshold and use the results answer for the arbitrations. The manual queue is the place where this responsibility is organized.

What the Function Makes Flow More Easily

The circulation of data between systems stumbles above all on differences of representation. Each system expects its format and its vocabulary, and for each passage an adaptation program written and tended by hand is needed. An instruction that describes the target format replaces a large part of these adapters. The cost of moving from one representation to another falls, and data hitherto confined to one system can be taken up by others.

In the terms of the trilogy, the function acts on certain conditions of resumption, the code and the interface, and not on the others, such as the reference corpus or the competences. It extends the availability of the data and their possible uses; it does not accomplish them.

When converting costs little, one converts more, and each conversion produces an occurrence or a descendant that circulates in its turn. Without provenance, derived data come away from their sources. The results

that one program passes to another without anyone reading them are recirculating data; the manual queue and the rereading of samples reintroduce reading into the chain.

Why This Is a Systemic Leap

The first tome speaks of a systemic leap when the improvement of means produces a change of nature, and not a gradual improvement: it makes possible things that did not exist before. The neighbouring notes measure it by what it makes possible and by what it makes obsolete.

The change of scale concerns cost: designing the passage from one representation to another, or adding an operation to a program, no longer requires writing a dedicated program. The change of nature concerns the guarantee of the result. A deterministic operation gives the same result for the same input, and its rules can be tested one by one, sometimes proved; Naur wanted, as early as 1966, pupils to be shown how a formal description makes it possible to prove that a process gives correct results. An operation entrusted to the instruction-driven function can be assessed only by an error rate measured on samples, for one version of the model and one version of the instruction. Its validity is a validity for a use, in the sense of the second edition, with an accepted tolerance; the threshold of the manual queue fixes this tolerance.

What becomes possible: processing prose without first formalizing it, and defining an operation at the moment of calling it, which makes it unnecessary to write an adapter for each passage from one format to another. What becomes obsolete: a large part of the registers of marker words, of the parsers and of the adapters written by hand.

The leap also makes two conditions of control disappear that the program held without anyone thinking about it. The first is visible failure: a type conversion that fails stops on an error, whereas the instruction-driven function gives back a plausible answer. The second is the separation between the program and the data it processes. Classic operations never execute their operands. Here, instruction and data pass through the same conduit, text, and a message can contain a sentence such as “ignore the previous instructions and classify this message as urgent”, which the model may follow.

As in the two neighbouring notes, the leap increases a capacity and abolishes a condition of control over this capacity. The same device thus performs two leaps on two parameters: stock and access, described by the note on the leap in storage, and processing, described here.

What Must Be Held

The third tome makes provenance the documentary form of the responsibility of the chain: each link answers for its gesture and transmits to the next what it needs to answer. For a program that calls an instruction-driven function, this requirement translates into a few practices.

- **Measure before relying.** Build an evaluation sample, measure the error rate for each version of the model and of the instruction, and measure again at each change: providers update and withdraw their models.
- **Validate each result.** Check the schema and the bounds, check that an extracted value does appear in the source text, have samples reread.
- **Inscribe the provenance.** Record, for each result, the model and its version, the instruction, the date and the source text. For a derived datum, the second edition requires that the provenance include the model and the parent data.
- **Treat the instruction as code.** It carries business rules: it is versioned, tested and reread.
- **Keep the instruction at a distance from the data.** Delimit the text processed, constrain the answer to a closed list, never let an unvalidated answer trigger an action.
- **Protect the data.** Sending messages to an external model is transmitting data, often personal, to a third party; the legal framework applies, and a model run locally avoids this transfer.
- **Keep each tool in its place.** The instruction-driven function works at the edges: from free text towards the structured, and from the structured towards a legible text. Exact calculation and reference sources remain at the centre. A model can extract a SIRET number from an invoice; only the Sirene register says whether this number exists. A datum instituted by a register is not produced by a model: the model extracts it or proposes it; the register institutes it.

A call to a model is often itself a call to a third-party service. Dependence on specialized services therefore does not disappear: it is concentrated on one provider, unless the model runs locally.

Conclusion — A Grid, Not a Verdict

The grid comes down to a few points: a function whose behaviour is given at each call; three regimes, which do not produce data of the same status; a representation that follows the tool; a guarantee that passes from construction to measurement; a tool that works at the edges.

The interfaces, costs and reliability of the models described here are those of October 2026 and will change fast. The finding of substance does not

depend on them: when a program can receive its operations in natural language, moving from one representation to another costs less, and the validity of the result is no longer guaranteed by construction. It is measured, for a use, and the provenance of the result must be inscribed.

The note neither recommends nor dismisses this use; it describes it, so that one knows what it makes possible and what it asks in return.

Landmarks

For the systemic leap and the operations that the first tome attaches to the leap in storage, see *Digging the Canal*, Part VII — “The Systemic Leap”.

For the three families of constitution and the derived datum, see *The Flow and the Annotation*; for validity for a use and the verisimilar datum, *The Two Times of the Datum*.

For occurrence, filiation and provenance, see the second tome, *The Properties of Movement*; for the conditions of interpretive resumption, *The Act of Exchange*.

For the situated position of handling or processing, the actual reader and the re-circulating datum, see the third tome, *Human Reading, Automatic Reading*; for the responsibility of the chain, *The Self-Knowing Reader*.

For the typology of the uses of a language model and the restoration practices, see *The Canal and the Workshops*, chapter 10.

For the neighbouring angles, see the notes *Code Displaced, Not Erased*, *The LLM as a Systemic Leap in Storage* and *The Envelope: Quality as the Tending of the Agreed*.

For Naur’s principle: P. Naur, “Datalogy, the Science of Data and Data Processes, and Its Place in Education”, *Proceedings of the IFIP Congress 68*, Amsterdam, North-Holland, 1968; and *Datamaskinerne og samfundet*, Copenhagen, Munksgaard, 1967. Both texts are collected in English in P. Naur, *Computing: A Human Activity*, New York, ACM Press, 1992, p. 223 and p. 547.

Text written in October 2026, to be tested by practice.

Adapting to the Torrent

Gamification, between the Acceleration of Reading and Discernment

“Adapting to the speed of the torrent is not reading more: it is learning no longer to see what one overtakes.”

Preamble — Status of This Text

This text does not belong to the trilogy *Tried by the Flow*. It is a brief extension of it, designed to keep a concise record of a reflection carried out on the margins of the writing: *can gamification — borrowing the mechanisms of games to regulate the relation of humans to the datum — be thought in the light of processual ontology, and what does it reveal about the concepts it calls on?*

The answer defended here is: gamification is in itself neither progress nor decline; it is a **technique for adapting the situated reader to the torrent**. As such, it has no value of its own: it is judged by what it serves. It serves **discernment** when it helps to decide what is worth reading or inscribing; it short-circuits discernment when it rewards mere reaction and substitutes the striking for substance. The text does not claim to cover the subject; it sets out the grid that makes it possible to come back to it, when the time comes, without having to rebuild everything.

It is addressed to a reader already familiar with the notions of the corpus — notably the systemic leap (Tome 1, doc 6; Tome 2), the two engines of the torrent (Tome 2) and, for reception, the reader’s window, over-throughput, the three paths (ways of not actualizing), the neglected datum and the pair mute datum / dead datum (Tome 3).

Gamification as a Systemic Leap in Reception

The torrent produces a great deal, and fast. Faced with this throughput that exceeds their window, the situated reader does not stay still: they adapt. But the adaptation observed most massively is not the one people think. It does not consist in reading *more* — we shall come back to this —, but in reading *at the speed of the torrent*. And to read at this speed, two things are transformed together: the means of reading, and the contents to be read.

The contents, first, change their nature. They become shorter, are summarized, condensed; and what they lose in development, they make up for by staging — animation, music, rhythm, accelerated voice, subtitles that catch what the speed of delivery would lose. The reader, for their part, also accelerates: they play a video at double speed to see two where they would have seen only one, they communicate by brief signs where they would have written sentences, they dictate where they would have typed.

This is not a faster reading *of the same kind*. It is a change of nature in what is received and in the way of receiving it — exactly the criterion of the **systemic leap** that the corpus set out: a leap is not measured by what it accelerates, but by what it makes possible and what it makes obsolete. What becomes possible: a format cut to be grasped at the speed of the flow. What becomes obsolete: the long, developed format, which needed the time of development to deliver its substance. The leap does not abolish reading; it moves its regime.

And like every systemic leap, this one is assimilated unequally. Tome 2 said it of every leap: whoever meets it early inhabits it as something self-evident; whoever meets it late asks for the old forms to be maintained. The generations exposed early to the torrent grasp it without effort; those who met it late go on asking for the long format. This is the coexistence of regimes, seen from the side of reception: not a clean switch, but a superimposition of windows that do not read at the same speed.

The Loop: Reading and Content Adapt to Each Other

This leap does not stay in place: it sustains itself. The torrent produces in mass; the reader, to keep up, accelerates their reading; the contents, to be read at this speed, become shorter and are staged; these contents of a new kind are added to the throughput — and the torrent, fed in this way, presses the reader a little more. The loop starts again, one notch higher.

This dynamic has exactly the form of the engines described in Tome 2: each of its steps, taken in isolation, is perfectly reasonable. Shortening a content so that it is read *is* reasonable; accelerating one's reading so as not to be left behind *is* reasonable. The problem lies in no step; it lies in the sum, and the sum is no one's project. But where the first engine of

Tome 2 operates on the side of production — one automates to process more, automation observes its own functioning, and these observations join the torrent —, this one operates at the junction of circulation and reception: it is the mutual adjustment of forms and readings that digs its own bed. It is not a third engine of the torrent; it is the same dynamic of self-amplification, observed where the throughput meets the window.

Reading Fast Is Not Reading More

A distinction is needed here that the word “adapting” covers too quickly. Faced with over-throughput, the reader has two routes open, and they are not of equal worth.

The first is to **widen** one’s window: reading more sources, extending one’s gaze, taking in more of what the torrent carries along. The second is to **accelerate** within the same window: reading the same quantity faster, following the flow at its cadence. Tome 3 established it: the reader’s window can be moved by instruments — the magnifying glass, the filter, the summary —, but never abolished, and each move has its cost and its blind spots; the instrument that shows more shows otherwise.

Adaptation by acceleration has its own blind spot, and it must be named: it is **substance**. Reading at the speed of the torrent is favouring what can be grasped at once — what strikes, astonishes, shocks —, for that is all that emerges from a reading too hurried to follow a development. Positions that need the time of reasoning to be understood do not cross this threshold: if they cannot be held in one sentence or one diagram, they hardly catch on outside the circle of those concerned. The debate that took the time to go into substance seems boring to the accelerated window; it needs spectacle, even if that means skimming over what it claims to deal with. This is the mechanism of the sensational: not a moral failing of readers, but the structural consequence of acceleration — what survives a reading that does not stop is what did not need anyone to stop.

Widening the window and accelerating it therefore do not produce the same blind spot. The first leaves in shadow what one does not have time to go and see elsewhere; the second leaves in shadow the depth of what one sees. The torrent pushes above all towards the second, because it costs less: it is easier to quicken one’s pace than to open a new way.

Disinterest, the Neglected Datum and the Dead Datum

What becomes, in this acceleration, of the developed content that the reader overtakes without reading it? Tome 3 gives it its precise name. The reader *could* read it — they have the code, the means, the access —,

but the throughput turns them away; they see it pass without reading it. This is the second of the three paths: **disinterest**, which calls not for a means but for a relation — the attention one grants or refuses, the probity of whoever decides that this is worth reading and that that can pass.

The content overtaken in this way does not die: it becomes a **neglected datum** — not mute, since this reader has its code and a gaze would have sufficed; it is only left by the one the torrent carries away. Neglect in mass is, as Tome 3 said, the **symptom** of the torrent — the sign that the throughput exceeds the windows. And it is only in the long run, for lasting want of any reader, that a part of it falls to the bottom and is no more than inscription: the **dead datum**, the **sediment**. This distinction must be held rigorously: what acceleration produces is not first of all dead data, nor even mute data, but neglected data in great number. Speaking here of a “mute trace” would blur these states; the right term is *neglected datum*, and it is the *trace* that is the last term of the scale, not the epithet.

The drama, as we have known since Tome 3, is not that data remain unread — many asked only to pass, their freshness being their only value, and their neglect is their normal fate. The drama is that **one no longer distinguishes what deserved to be read from what could be left**. Generalized acceleration does not only blur reading: it blurs the sorting prior to reading, the discernment that separates scarce attention from what can pass without harm. And it is this discernment, precisely, that gamification can sometimes serve, sometimes dissolve.

The Other Face — Gamification in the Service of Discernment

Everything above outlines a dark face. There is another, and it is the same gesture. For the mechanisms of games — immediate feedback on the action, progress made visible, learning through practice rather than through instructions — do not serve only to capture a hurried attention; they can also regulate a relation to the datum where this relation was overlooked.

Two contributions hold, on condition of stating them at the level of substance. The first concerns **making**. The act of inscription — perceiving, distinguishing, interpreting, aiming, inscribing — requires care, and a botched inscription produces a datum that no one will be able to put to good use. A device that rewards the regularity and precision of inscription with immediate feedback on the gesture supports the care that the act requires: the datum produced in this way is properly fixed, and holds for the journey. The second concerns **reception**. A dashboard is, in the sense of Tome 3, an instrument that moves the reader’s window: it cuts the flow of their own activity into a few reference points that they can grasp at a glance. Making this cutting legible and engaging is helping the

reader to direct their attention to what, in their own flow, is worth reading — that is, helping them to sort.

These two contributions belong to substance; everything else belongs to **form**, and form is dated. The contemporary implementations — customizable interfaces, visual metaphors, transposition of the codes of games, statistical methods for monitoring activity, local predictive models — illustrate what face the gesture can take today; they will be replaced, while substance will remain. The corpus retains from them only what survives their replacement: a regulated feedback on the act of inscription, and an instrument that makes the window practicable. One will note finally that the data artisan, to whom such tools would be addressed, remains a **craft yet to be created**: the corpus establishes its necessity; it does not describe its form, and no tooling could be presented as already equipping it.

A Posture, Not a Recommendation

The corpus does not prescribe. It sheds light — it invites us to see the gesture for what it is. The present text does nothing else.

Naming gamification as a technique for adapting to the torrent suggests neither fleeing it as a manipulation nor embracing it as an ergonomic progress. It suggests holding the **divide** that decides it. Tome 2 provided the criterion: the torrent swells not for want of knowledge, but for want of wise arbitration — for want of the question *should we?* being asked somewhere. Gamification falls entirely on that side. It serves when it helps to ask this question — is this worth stopping for, can that pass? It does harm when it conjures the question away: when feedback rewards reaction and not discernment, when progress measures completion and not care, when the mechanism that was to help sorting only accelerates.

Conclusion — A Grid, Not a Verdict

This grid — *gamification as the adaptation of the reader to the torrent, and the divide that decides it* — does not exhaust the subject. It sets out one side of it, which extends what the corpus already says about the systemic leap and over-throughput.

It makes one thing possible: *speaking about gamification without depending on the state of interfaces at a given moment*. What is true in June 2026 — such applications, such mechanisms, such metaphors — will be obsolete before the end of the decade. What will remain true: that humans, faced with a throughput that exceeds their window, adapt their reading, and that contents adapt in return; that the acceleration that results has substance

as its blind spot, and the neglected datum as its symptom; and that the same mechanisms that divert attention can, used otherwise, regulate it — depending on whether they serve sorting or short-circuit it.

This, in a few words, is the substance that must be held. For the rest — which mechanisms, in which uses, on what conditions —, it is for each reader, in their context, to make the chart.

Landmarks

For the conceptual foundation of the systemic leap, see Tome 1 *The River and the Canal*, document 6 (*Digging the Canal*), Part VII — “The Systemic Leap”; and, for the coexistence of regimes and the two engines of the torrent, Tome 2 *From Spring to Torrent*, document 7 (*Self-Amplification*), Parts I and II.

For reception — the reader’s window, over-throughput, the three paths (including disinterest), the neglected datum, the mute datum and the dead datum, symptom and sediment —, see Tome 3 *The Trace or the Datum*.

For the act of inscription, fixation and the two times of the datum (freshness, lapse), called on with regard to the quality of inscription, see Tome 1 *The River and the Canal*.

For the diagnosis according to which the torrent swells for want of wise arbitration — the question *should we?* —, see Tome 2, document 7, Part III.

For the neighbouring notes that deal with other systemic leaps of the contemporary moment, see *Code Displaced, Not Erased* and *The LLM as a Systemic Leap in Storage*.

For the status of the data artisan as a craft yet to be created, and for the steering tooling considered only as form, see *The Data Artisan*, *The TRACE Programme* and *Technical Data*.

Text written in June 2026, to be tested by practice.

The Bearer Datum and the Borne Datum

Existential Dependence between Data

Preamble — Status of This Text

This note does not add a tome; it isolates a relation that the trilogy presupposes without naming it. The first tome showed how a datum is made — by an act of inscription that fixes a drawing, institutes a fact under a rule or derives a result from other data. But not all data stand on their own: some exist only through another. Naming this dependence is making explicit a fact of structure, true independently of any technique. The *realization* of the relation — how, concretely, one holds it in a medium — belongs to the manual, not here.

A Datum That Exists Only through Another

An ordinary datum proceeds from its own act of inscription: one has drawn, one has inscribed, it holds. Others do not have this autonomy. Their inscription is not deposited separately: it derives from that of a host datum, on which it leans. And their meaning does not open on its own: their reading window lights up only through that of the host. The host datum is called the **bearer**; those that hold only through it, **borne**.

A reminder exists only through the quote it follows up; take away the quote, and the reminder says nothing any more; it had no object of its own. A marginal note exists only through the line it annotates; an attached document, only through the datum it documents. In each case, the borne datum never had an act of inscription of its own: it came into the world in the act of another.

Shared Fate, and Not Mere Reference

The mark of dependence is not that one datum *refers* to another — two autonomous data do that without depending on each other. The mark is

shared fate. The borne datum is born with its bearer, circulates with it, passes into lapse with it, and goes down with it when its age comes. Removing the bearer is removing its borne data: they do not survive alone, for want of a reading window of their own. The dependence runs in one direction only: the bearer, for its part, holds without its borne data.

Reference: a Link That Does Not Tie Existence

The borne datum must be distinguished from a neighbouring link, with which it is easily confused: **reference**. A datum can designate another — name it, refer to it — without their existences being tied together. The referred datum has its own act of inscription, its own window, its own fate: it lives a life of its own. Two data sets that refer to the same client are not bearer/borne; the client is *referred to*, not *borne*. The number of an extension can designate the person who answers it: this person exists independently, and does not cease to be if the number is erased — any more than the number is erased if the person leaves.

The difference is not one of words; it **governs deletion**. Removing a bearer removes its borne data, which no longer have an object. Removing a datum that is only *referred to* breaks only the **reference**, not the existence of what was designated; and removing what designates does not touch what was designated either, which subsists alone. The borne datum shares the fate; reference links without engaging the fate. Faced with two linked data, the situated reader must know *which of the two links* they have before them — for on this depends what dies with what, and what survives alone.

What Must Not Be Seen in It Either

One last safeguard. The **new datum that comes from a subsequent act of inscription** — a consolidation, a recounting — is not a borne datum of the datum from which it proceeds: it became autonomous as of its own inscription, and opens a filiation. A copy is not one either: it multiplies the occurrences of the same datum without making a new datum. The borne datum, on the contrary, has never come away from its bearer.

Landmarks

- A datum is a **bearer** when others exist only through it; these dependants are its **borne** data.
- The borne datum has **no act of inscription of its own** nor an autonomous reading window: its meaning and its fate depend on those of its bearer.
- The mark of dependence is **shared fate** (being born, circulating, passing into lapse, going down together), not mere reference.

- The dependence is **one-way**: the bearer holds without its borne data; the reverse is false.
- **Reference** is another link: the designated datum has its own life. It **does not share the fate**. Deleting it breaks only the reference; deleting what designates it does not affect it.
- **Consequence for deletion**: removing a bearer carries its borne data with it; removing a datum that is only referred to carries nothing with it, except the breaking of the reference.
- Not to be confused either with a **new datum** that comes from a subsequent act of inscription (consolidation, recounting), autonomous as of its own inscription, nor with a copy, one more occurrence of the same datum.

Armature: the Canal Dug in Stable Sources

The Conventional Data That Structure an Activity

Preamble

The canal was first a metaphor and a gesture: the apparatus that, from the flow of the real, captures fragments according to an intention. This note looks at what this canal is made of when a work makes it concrete — and corrects an easy shortcut: the armature is not an exception to the datum; it is a case of it.

The Armature Is Made of Data

When an activity organizes itself, it inscribes names, groups, containers, types: “company”, “contact details”, “an address has a postcode”, “a telephone number has a format”. One would be tempted to see in them something other than data — a structure set down from above. It is an error. The first tome leaves no way out: there is no datum that is not born of a drawing (observational route), of an act that institutes or of an operation that derives. And drawing is a **composite act** — choice of the object, of the moment, of the instrument, *and of the category*. The category is not outside the datum: it is one of the choices that make it. The tablets of Uruk already classified sheep according to administrative categories: the grid was part of the inscription. The armature — names, types, formats — is of this fabric. It is made of data.

Drawn from Stable Sources

But of data of a particular kind. They are not drawn from the volatile real of the activity — such an order, such an amount today —; they are drawn from the **agreed**: the socio-technical and business conventions that fix, for a territory and a time, how one designates an address, a number, a surname, a legal form. These conventions are **stable sources**: the real they mark

— the way a society agrees to name things — moves away slowly. Hence their lasting validity for use: one can rely on them for a long time. The entrepreneur, and the artisan who supports them, **plant their springs** in this agreed, and draw from it the armature that will hold their activity.

Construction without Invention

This drawing is not an invention. It is the exact point that the first tome held for the observational route: the datum is *constructed* by the act, but *held* by a real trace. The dendrochronologist does not decree “87 years”: they read the rings, apply the rule, count — their datum is constructed, but arbitrated by the wood. Likewise, the entrepreneur does not *decide* alone that an address has such a form or that sending an email requires a “recipient”, a “subject”, a “content”: they **read the convention**, a rule fixed by collective agreement, and draw from it. The armature is therefore constructed — they choose *which* beds to open, at *what* depth — but never invented: the convention is there to arbitrate it. Saying that it would be “set down” by the entrepreneur alone would make it slide towards pure invention — the number suspended in the void that the corpus refutes.

No Outside-the-Flow: the Armature Drifts Too

The stability of these sources is a **ratio of speeds**, not an exit from the current. There is no outside-the-flow: the conventions themselves drift, only slowly. Let us imagine it — tomorrow the address would be no more than a triplet [latitude, longitude, altitude]; the email, the unique identifier of a mailbox receiving every type of data; the number of the identity document, the only datum to fill in to refer to a person. The day the convention moves, the **armature evolves**: the artisan re-draws, in the new agreed, the beds that the work digs. The armature is lasting, not eternal — and it carries the danger proper to stable sources: that one forgets that it drifts, and holds as valid a format that society has already left.

Standardization, the Condition of Interoperability

That the armature is drawn from a *shared* agreed is not a detail: it is what makes the datum **transmissible and connectable**. Because two entities draw on the same conventions, an order placed by one is legible to the other (**exchange**); data sets are pooled for a collective intelligence (**sharing**); and tools, which require settled forms — an email wants “recipient”, “subject”, “content”, at the minimum —, can process them. Standardization is the share of form without which transport remains a dead letter: it makes *the reader’s share practicable*. Conversely, recording everything in a single free field — a block of text where the information is present but indistinct — leaves the datum where it is: no one knows how

to extract an element from it precisely, nor how to transmit it without ambiguity. Agreeing on the armature is what the instruments of an orchestra do when they tune to the A: not out of a taste for uniformity, but so that something common can be played.

The Canal-Keeper's Task

Drawing the right armature from the conventions — deciding which beds to open, down to what depth, without lining a ditch with masonry (over-engineering) or falling below the threshold (under-drawing) —, and keeping it **attuned** to the conventions as they evolve: this is the task of the **canal-keeper**. The observational optimum holds for the armature as for the rest. The armature makes visible what the canal-keeper makes: not invented data, but a canal dug in the agreed, through which the activity will be able to draw, fix, transmit and reread.

Landmarks

- The **armature** is the structure that organizes an activity: names, types, formats, containers. It is **made of data** — every datum is born of a drawing (observational route), of an act that institutes or of an operation that derives, and the category is part of the composite act.
- Its data are drawn from **stable sources**: the socio-technical and business conventions, of lasting validity for use (“one can rely on them for a long time”).
- It is **constructed, not invented**: the entrepreneur and the artisan *read* the convention (a rule fixed by collective agreement) and draw from it; they do not decree the form.
- **No outside-the-flow**: conventions drift too, slowly. When they move, the armature evolves. Lasting, not eternal.
- The **standardization** of the armature (a shared agreed) is the condition of **interoperability**: exchange between entities, sharing, compatibility with tools. It is the agreement on the A.
- Digging the armature to the right depth and keeping it attuned is the **task of the canal-keeper**, regulated by the **observational optimum**.

The Envelope: Quality as the Tending of the Agreed

The Support Process That Describes the Armature and Makes It Transmissible

Preamble

The note on the armature showed what the canal is made of: data drawn from stable sources, the agreed. It remains to say how this agreed is established and kept up — for it does not go without saying, and nothing maintains it but those who use it. This is the object of this note. Its core belongs to substance; its application — what is called today “quality” — belongs to form.

The Envelope That Describes Its Content

The first tome recounted the founding gesture. First, standardized tokens had been shaped, one for each category — a measure of grain, a sheep, a jar of oil. Then they were enclosed in clay **envelopes**, to transport them and certify a transaction. Then the imprint of what the envelope contained was engraved on it, to avoid breaking it at each check. And **soon the imprint was enough**: the object inside is no longer necessary; the outer sign says everything.

This is the exact model of what is at issue here. The standardized tokens are the **categories of the armature**. The envelope that describes its content is **quality**: it does not draw the real of the activity; it **describes** the apparatus that will draw it — its names, its types, its formats. And “the imprint is enough” names what standardization aims at: formalizing once so that, later, **specifying the armature** (reading the inscription on the envelope) is enough to reproduce it, without having to rebuild it token by token. Quality takes the armature from a workpiece remade each time to an apparatus that is **reusable, transmissible, adopted**.

(The word is taken here in the sense proper to this note — what envelopes

and tends the agreed — unrelated to the clay bulla-envelopes of the history in the first tome, which are objects, not a concept.)

A Stable Source of a Particular Kind: Intended Stability

The second tome established that the stability of a source is a ratio of speeds: the real it marks moves away slowly. But two ways of being stable must be distinguished. The height of Mont Blanc, the grammar of a language drift slowly **of their own accord**: their stability is **undergone**; no one tends it. The agreed — conventions, standards, quality — is stable in another way: its stability is **intended**. It holds only through the investment of those who adopt it and maintain it. Should they stop, and it comes undone: the *calculi* themselves were replaced by cuneiform. This is the “long time” proper to the agreed — not the undergone time of natural sources, but a **tended** time, suspended on the will of the actors to set up, operate and perpetuate the agreement.

This confirms, and does not contradict, the absence of an outside-the-flow: the tended stable source drifts like the others, but its drift depends on a will — the one that keeps it up, or lets it go.

A Support Process

Hence its status. Quality does not produce the data of the activity — the order, the amount, the appointment. It produces and tends the **shared agreed** from which the armature is drawn, and through which the datum becomes **transmissible and connectable**. It is, in the sense of the volume proper to it, a **support process**: it does not make the work; it supports whoever makes it. It is because two entities draw on the same agreed that an order placed by one is legible to the other (exchange), that data sets are pooled (sharing), and that a collective intelligence becomes possible. Standardization is the share of form that makes **the reader’s share practicable**; without it, transport remains a dead letter.

A Collective Tending

This intended stability has a consequence: it is the business of all those who depend on it. The third tome said it of reading — a society tends the referents to turn to —, and Ostrom of the commons — a shared good is maintained only through a governance that tends it. The agreed of the armature is such a good: a commons that one does not own and that must be kept up. Letting it wither is falling back into the danger proper to stable sources — holding as valid an agreement that the world has left — but aggravated, for here no slow real supports the agreement in our place: only tending keeps it up.

It is here that quality is anchored in the data craft. The canal-keeper does not only dig the armature in the agreed; they **tend the agreed** — they keep the envelope up to date, make sure that its imprint still says what it contains, and connect the work to the agreements that make it interoperable. Helping, making autonomous, not dispossessing holds for the agreed too: a client must be able to exchange and share without being captive to a private agreement.

Safeguard on Form

All this is dated as regards its machinery. “Quality” — management systems, norms, standards — is the way our time establishes and tends the agreed. It has not always existed; it will evolve, and may be replaced, as the *calculi* were. What remains, and what is substance, is that the datum is transmissible only through a **shared agreed**, and that this agreed, being stable only by will, **requires tending**. The form this tending takes belongs to each time; its necessity does not.

Landmarks

- **Quality** is the **support** process that describes the armature and makes it transmissible: the **envelope** that says its content, until “the imprint is enough” (reusable, transmissible, adopted).
- The agreed of the armature is a **tended stable source**: its stability is **intended**, not undergone; it holds through the investment of the actors, and comes undone if that investment stops.
- This standardization is the **condition of interoperability** — exchange, sharing, collective intelligence: it makes the reader’s share practicable.
- The agreed is a **commons**: it requires **collective tending** (Ostrom, the tending of referents). Letting it wither is holding as valid an agreement that the world has left.
- **Safeguard on form**: “quality” (QMS, norms) is the contemporary machinery of this tending — dated, replaceable. Substance is the necessity of a shared and tended agreed.

Designing a Project in the Light of Processual Ontology

The SASactiv Case

“The concept lights up the area where one must look; it does not make the chart of the reefs. That chart, in each particular water, is for the navigator to make.”

— *The Canal and the Workshops*, closing

Preamble — Status of This Document

This document complements the book *The Canal and the Workshops* without being part of it. It offers a **practical exercise** for anyone who would like a concrete case of application of the processual grid — not an existing case to be analysed retrospectively, but a model project to be designed, worked out by the author to serve as an example.

Where the book of practical application goes through existing sectors to recognize the grid in them, this document does the reverse: it starts from the grid to design a project. The demonstration is complementary. Diagnosing what exists and designing what could be do not call on quite the same gestures, and the toolkit gains by offering both.

The project presented — SASactiv, on coordination between health actors to anticipate the load of the Access to Care Service (Service d’Accès aux Soins, SAS) — is not a project under way. It is a forward-looking sheet, worked out to serve as a support for this demonstration. Its value is not in the assessment of its operational feasibility, but in what it makes it possible to illustrate: how a conceptual grid can **equip design**.

Part I — Why a Forward-Looking Case

The book *The Canal and the Workshops* went through a series of existing sectors, where flows of observation are already kept up by identified actors. Its function there is diagnostic: spotting structural biases, loops, specific perils, the undrawn. It is a retrospective reading, which takes a state of the world and questions it.

But the processual grid does not serve only to diagnose. It can also **equip design**: help to imagine, to size, to articulate a project that does not yet exist. This forward-looking dimension of the grid deserves to be demonstrated, because it is not evident from reading the descriptive chapters alone. A model case, treated in constructive mode, gives its measure.

Four axes, identified at the opening of this document, structure the illustration:

Inter-organizational coordination. When a project articulates several heterogeneous actors — public institutions, self-employed professionals, platforms, citizens —, the grid makes it possible to think what each brings to the collective flow of observation, and what this collective flow makes possible that the separate flows did not allow.

Prediction and its relation to freshness. When a project produces no longer *observed* data but *verisimilar* data — projections, forecasts, anticipatory scores —, the grid of the two times takes on a particular colouring. A prediction does not have the same nature as an entry, and confusing the two produces errors.

The design ex nihilo of a flow of observation. The book showed how to read an existing flow; this document shows how to design one. The observational optimum, the cadence, the corpus, the instrument: these parameters, which one diagnoses in others, must be chosen when one is oneself at the starting point.

Collective intelligence as pooling. Tome 2 set out that transporting a datum multiplies its carriers, without dispossessing whoever transmits it. This property founds a particular form of intelligence: not an intelligence concentrated in one actor, but a distributed intelligence that arises from the pooling of flows that no one could produce alone.

These four axes are not specific to health. They hold for every project of this nature: environmental prevention, territorial management, logistical coordination, economic anticipation. The health sector, here, is only the support — the project could be adapted, *mutatis mutandis*, to other fields.

Part II — The SASactiv Project in Brief

SASactiv aims to transform the management of the Access to Care Service (SAS) — a referral system for unscheduled care — from a reactive posture to an anticipatory posture at 72 hours.

The project rests on a geolocated load indicator, graded from 1 to 9 (under-load / normal load / excess load), produced daily by a hybrid model combining time series and machine learning. The model is fed by four families of flows: the activity logs of the SAS (call volume, type of referral), forward availabilities (open slots, inactivity rate), calendar factors (public holidays, school holidays, weekends), and exogenous events (public gatherings, epidemics, major weather events).

The indicator triggers action protocols differentiated according to the predicted level. In anticipated excess load, resources are mobilized upstream — reinforced on-call shifts, extra slots opened in community care, proactive redirections. In anticipated under-load, staff are kept available but temporarily reallocated to ancillary activities. A correction loop is planned for prediction errors.

The project explicitly articulates several actors: the SAS, hospitals, self-employed professionals organized in Territorial Professional Health Communities (Communautés Professionnelles Territoriales de Santé, CPTS), Regional Health Agencies (Agences Régionales de Santé, ARS). The governance provides for a shared steering committee. Performance indicators — model accuracy, adoption rate, reduction of excess load episodes — frame the evaluation.

This factual presentation is enough for what follows. The following parts examine it through the grid of the three phases.

Part III — Reading through the Three Phases

In the First Phase — Making

SASactiv calls on four flows of observation with distinct intentions, which must be named separately before being aggregated.

The activity logs are a flow of observation kept up naturally by the functioning of the SAS: each call leaves a trace that becomes a datum by its mere recording. This flow was not **intended for prediction** — its intention of the apparatus is operational traceability — and prediction is only a **secondary reuse** of it, an intention of use that came afterwards. This dual purpose is not trivial: a flow designed for one use and reused for another carries the biases of its initial intention.

The forward availabilities are a flow built deliberately, in which each actor (hospital, self-employed doctor) declares their open slots. Its intention

is explicitly to share. Its fidelity depends on the declarative diligence of each actor — a flow whose quality rests on the distributed probity of the contributors.

The calendar factors are a typical case of a *stable source* in the sense of Tome 2: the calendar of public holidays and school holidays evolves very slowly. This is exactly what makes this source integrable into a 72-hour prediction model without any concern for refreshing.

The exogenous events are, conversely, a flow of rapid lapse: an unanticipated event must be integrated into the window of the prediction, on pain of degrading it. This flow is also the most exposed to the undrawn — an event not captured remains invisible to the model.

The **observational optimum** lies in several arbitrations. The first is **geographical granularity**: the catchment area of a health centre, an on-call sector, a département? Too fine, it produces a noisy signal; too coarse, it masks local heterogeneities. The second is **temporal granularity**: predict by time slots or by day? The sheet chooses the rolling day, but this choice would deserve to be justified with regard to the rhythm of mobilization decisions. The third is the **predictive horizon**: why 72 hours and not 48 or 96? The sheet justifies it by the balance between freshness of the prediction and lead time for action. It is an exemplary optimum decision, which would deserve to be documented as such.

The **1-9 indicator** is a typical derived datum: it aggregates several flows through an explicit function (forecast volume relative to available capacity, weighted by the factors). Its signature of making — who will sign what it produces — is one of the sensitive points of the project: one signs a prediction, and therefore a verisimilitude, not a fact. This point calls for separate treatment, below.

In the Second Phase — Circulation

SASactiv is, in its essence, a project of **propagation** in the sense of Tome 2. Four distinct flows, kept up by separate actors, come together to form a flow of a higher level — the indicator, a derived datum — from which each benefits whereas none could have produced it alone.

The **chain of making** has several storeys: drawing by each actor, transmission to the central system, processing by the model, rendering in the form of an indicator. Each storey is a point of fidelity, but also of delay. Traceability back to the source — being able to explain why the indicator is at 7 rather than 4 — is a strong requirement of the project, which translates technically into the need for **explainable** models (the sheet mentions XAI as a prospect of evolution).

Multiplication by copying plays fully here. The indicator produced at an instant t is shared among dozens of actors simultaneously. None is dispossessed of it by transmitting it. This property is what makes coordination

possible: if the datum were deposited with a single actor, coordination would not exist.

But the sharing of the fact also carries a risk of its own: **loss of context in circulation**. A 1-9 indicator transported far from its making can be read without access to the criteria that produced it. The hospital director who sees “load at 7 tomorrow” does not necessarily have before them the weighting factors or the exogenous event that pulled the prediction upwards. The work signature, as the book proposes it in chapter 11, becomes here a critical tool: each indicator delivered should carry its conditions of production.

Collective wisdom finds a particular embodiment in this project. The sheet explicitly provides, in case of a prediction of under-load, for **not mobilizing** reinforced on-call resources. This non-mobilization is not an absence of action: it is a collectively deliberated act, founded on a shared verisimilitude. This is exactly what Tome 2 names: *abstention is not neutral*. Making it visible and deliberated transforms an invisible non-action into a posture that can be weighed.

In the Third Phase — Reception

The 1-9 indicator has several distinct **situated readers**, whose windows do not coincide.

The **ARS coordinator** reads the indicator at the regional scale, over a strategic horizon. Their window is wide, their cadence of action slow, their tolerance of uncertainty relatively high.

The **hospital director** reads the indicator at the scale of their establishment. Their window is narrower, their cadence of action faster, and they must translate the indicator into planning and logistics decisions.

The **self-employed doctor** integrated into the CPTS reads the indicator at the scale of their practice. Their window is the narrowest, their cadence daily, and they must translate the indicator into concrete availability.

These three readers receive **the same indicator** but cannot make the same use of it. The probity of the project requires that the indicator be **legible to each according to their window** — which raises, in practice, the question of translation. An indicator at 7 does not say the same thing to the hospital director who must decide on an extra on-call shift as to the self-employed doctor who must decide whether to open a slot. The design of the project must provide for this multi-reader translation.

A particular question deserves to be asked: what happens **when the indicator is not read**? The sheet identifies the adoption rate as a KPI, which is right — an indicator not consulted produces no effect. But non-reading can belong to the three paths identified in Tome 3.

Incapacity: an actor does not consult for want of access to the tool, or for want of knowing how to interpret it. A remediable path, which calls for an

effort of training and accessibility.

Disinterest: an actor has access and knows how to read, but the throughput of information they receive leads them not to consult. A path that calls not for a means but for a relation — the perception of usefulness.

Rapid lapse: an actor consults the indicator too late, after the window of action has closed. This last path is particularly important for SASactiv: an indicator forecast at 72 hours has value only if it is consulted within the time in which it can still orient the decision. The sheet provides for a generation time of under 5 minutes, which addresses the production side; one would also have to think about the **consultation** side, that is, the routines by which the actors integrate the indicator into their decision cycle.

Part IV — Four Axes That the Case Sheds Light On

Beyond SASactiv itself, the case illustrates four more general dimensions, transposable to other projects.

Inter-Organizational Coordination

A project that mobilizes several heterogeneous actors faces a structural difficulty: **the upstream intentions differ**. The SAS collects logs to ensure immediate referral; the hospital reports availabilities to manage its schedules; community care declares its slots to make its offer known. None of these flows was designed, originally, to feed a prediction of collective load.

Designing a coordination project is therefore first of all **making compatible flows designed for something else**. This can go through technical conversions (standardization of formats), semantic agreements (what does one call an “open slot”?), quality commitments (how often does each actor update their declarations?). Without this upstream work, the aggregation produces an indicator that says less than one believes it says.

This difficulty is generic. It would be found in a project of territorial water management (where municipal technical services, farmers and industrial firms each have their flows), in a project of logistical coordination between transport operators, in a project of environmental prevention. The processual grid helps to see it and to work on it.

Prediction and Its Relation to Freshness

SASactiv produces **verisimilar data**, not observed data. The distinction is not trivial. An observed datum has a date of inscription and a flow of the real to which it relates. A verisimilar datum has no instant of the real: it relates to a future or possible state, calculated from earlier observed data.

This difference changes everything one can do with it. An observed datum can be contested by a new observation. A verisimilar datum can be contested only by another prediction, or by the event when it occurs — the moment when verisimilitude disappears in favour of fact. Before this event, the verisimilar datum exists in a particular regime: one acts on it, but one cannot check it.

For freshness, this means that a prediction goes stale **twice over** for the decision it serves: through the moving-away of its instant of calculation (like every datum that claims to tell the present) and through the arrival of the event it anticipated (yesterday's prediction about today becomes obsolete as soon as the day begins). This double lapse calls for a rhythm of recalculation that has no equivalent in the regime of observed data.

The project must therefore think explicitly: at what rhythm is the prediction reproduced? How can yesterday's prediction and today's be articulated when they diverge? How can predictions that are stale for the decision be archived, since they remain valid for another use: measuring, afterwards, the performance of the model?

The Design Ex Nihilo of a Flow of Observation

Reading an existing flow and designing a new flow do not call on the same gestures. Diagnosing is starting from a state of the world and questioning it. Designing is starting from a question of use and deciding what must be drawn to answer it.

Design follows, broadly, the reverse order of diagnosis. One starts from the **question of use**: what decision will the future flow have to serve? One deduces from it the **necessary fineness** — temporal, spatial, qualitative. One then chooses the **instrument** (sensor, form, automatic log) and the **cadence**. One checks that the combination is economically and operationally sustainable. And one goes back if the cost is prohibitive, relaxing the fineness up to the point where the cost becomes acceptable without the decision losing its meaning. This is exactly the work of **observational optimum** that Tome 1 names.

For SASactiv, this work would have led to the following choices: 72 hours because that is the reasonable lead time for mobilizing human resources; a 1-9 indicator because that is the scale legible to all the actors without training; geographical granularity set on the existing on-call zones to avoid introducing a new geography. Each choice can be documented as an optimum decision, with its justifications and its limits.

Collective Intelligence as Pooling

The fourth axis is perhaps the deepest. Tome 2 established that transporting a datum multiplies its carriers without dispossessing whoever transmits it — that it is shared like a fact. This property founds the possibility

of a particular form of intelligence: not an intelligence concentrated in one actor, but a distributed intelligence that arises from pooling.

SASactiv is an illustration of it: no actor alone could have predicted the load at 72 hours. The SAS knows its calls but is unaware of hospital availabilities; the hospital knows its beds but is unaware of referral volumes; the self-employed know their slots but are unaware of the upstream pressure. The prediction emerges from pooling — and this emergence is inaccessible to each taken alone.

This collective intelligence has its conditions of possibility, which the processual grid helps to name. It presupposes **compatible** flows (intentions, cadences, granularities); it presupposes **traceability** back to the sources; it presupposes a **shared probity** of the contributors (each maintains their flow rigorously, failing which the whole degrades); it presupposes finally a **governance** that answers for the consolidated flow without anyone owning it.

These conditions are not given; they are built. And this is precisely what the design of a pooling project must provide for explicitly, on pain of producing an aggregate that does not hold. SASactiv provides for a shared steering committee — it is one of the elements by which governance is built. But the concrete organization of distributed probity (who audits what, how often, with what consequences) remains to be worked out in implementation.

Part V — Limits and Open Questions

This document does not deal with everything. It must be said so that it does not claim to be more than it is.

It does not deal with the **operational viability** of SASactiv. Is the project, as a sheet, feasible in the health, legal and economic conditions of 2026? This question is not the object of the document. A feasibility study carried out by specialists of the sector would say; this document, which stays at the conceptual level, does not pronounce on it.

It does not deal with the **political choices** that SASactiv presupposes. Should community-hospital coordination be intensified? Should the health system be steered by data? Should one accept that a predictive model orients mobilization decisions? These questions belong to public debate and to the political field; they go beyond the conceptual scope of the processual grid. The book *The Canal and the Workshops* kept, on this point, a strictly cartographic posture; this document keeps to it too.

It does not deal with the **alternatives**. SASactiv is *one* possible project among others; its concrete form could be different (other horizons, other actors, other models). This document does not elect SASactiv as the right project; it uses it as a support to show how the grid can shed light on

design. Other model cases could be analysed in the same way, in other sectors, and eventually feed a corpus of forward-looking illustrations.

It does not deal with the **sectoral ethics** proper to health. The stakes of protecting patient data, of consent, of medical confidentiality, are serious and specific to the sector. They belong to a legal and deontological work that is not within the scope of this document. They were partly mentioned in chapter 5 of the book of practical application, from a sectoral perspective.

These acknowledged limits give the document its right measure: it shows how the processual grid can **equip design**, on one case, in four directions. The rest belongs to other works.

Conclusion — The Grid as a Design Tool

Processual ontology is not only a diagnostic grid. It can also equip design: help to think a project before it exists, to size it without locking it into a frozen model, to anticipate its points of fragility, to provide for its probity.

SASactiv will have served as a support for this demonstration. The project, as such, will remain what it is — one forward-looking sheet among those one can design. But the gesture it illustrates can be generalized: taking the grid of the three phases, applying it to a project under construction, and looking at what it sheds light on and what it leaves to the situated decision.

Designing a flow of observation is digging a canal in the river. Designing a coordination project is linking several of them into a network whose water will feed what no isolated canal could nourish. Tome 1 taught how to dig; Tome 2 taught how to articulate; Tome 3 taught how to read what arrives at the end. The present document, starting from a case, shows that the three teachings are, simultaneously, tools of design.

This is perhaps the main promise of the project of the trilogy: not only understanding what happens with data, but knowing how to design what could be done — patiently, lucidly, without illusion. The grid does not say which project to undertake. It equips whoever has decided to undertake one.

Appendix — SASactiv Project Sheet

SASactiv: Predictive Optimization and Coordination of the Access to Care Service (SAS)

Proposal: transform the reactive management of the SAS into a proactive strategic posture at 72 hours through artificial intelligence (AI) *forecasting*.

Key features	Target added value
Predictive horizon: rolling 72 hours	Optimal balance: sufficient lead time for mobilizing resources
Modelling: hybrid multi-model approach (time series + machine learning)	Robustness in the face of volatile demand
Indicator: geolocated load index (1 to 9)	Targeted operational alert by zone and time slot
Partnership: reinforced community-hospital coordination	Shared vision and anticipated collaborative arbitrations

Problem and Strategic Objectives

Central Problem

The Access to Care Service (SAS), a key system of the Emergency Services Overhaul Pact (Pacte de refondation des urgences), is vulnerable to unpredictable fluctuations in the demand for unscheduled care. This volatility generates excess loads (congested emergency departments, staff shortages, impossibility of slots within 48 hours) and under-loads (under-used resources, high operating costs).

Project Objectives

- Anticipate the operational load at 72 hours.
- Optimize the allocation of resources (human, material, slots) according to anticipated demand.
- Improve the fluidity of the patient pathway and reduce delays in access to care.
- Reinforce community-hospital coordination through anticipated information.
- Reduce the costs linked to overstaffing and emergency orders.
- Guide local policy on the supply of care.

Architecture of the Solution and Modelling

Multi-Source Data

The predictive model rests on the integration of heterogeneous data for a contextual intelligence.

- **SAS activity data:** call logs (date, geographical zone, volume); history of referrals (date, geographical zone, type of referral — practitioner, emergency department, advice, not relevant).
- **SAS parameter data (forward availability):** open slots (date, geographical zone, number); inactivity rate (date, geographical zone, inactivity rate).
- **Calendar factors:** public holidays, weekends, school holidays (date, geographical zone, weighting coefficient).
- **Hazards and exogenous events:** major impactful events (date, geographical zone, weighting coefficient).

Functioning of the Predictive Model

Load indicator: daily generation of an index on a scale from 1 to 9, geolocated.

- 1-3: under-load (excess capacity).
- 4-6: normal load (balance of supply and demand).
- 7-9: excess load (risk of saturation).

Calculation by aggregated formula: $\text{Charge} = f(\text{Volume_prévu} / \text{Capacité_disponible}) \times \text{Pondération_facteurs}$, normalized on the 1-9 scale.

Hybrid methodology: combined use of time-series and machine-learning models through an ensemble approach (*ensemble learning*) to maximize reliability.

Technological note: using foundation models through an application programming interface (API) can speed up deployment and maintenance, and make it easier to choose the models best suited to prediction.

Associated Preventive Actions

The system triggers anticipatory action protocols to avoid service breakdowns.

Indicator	Target	Key actions
Excess load (≥ 7)	Reinforcing capacity	Hospital: adjusting schedules (on-site and on-call shifts), activating extra beds, anticipated orders of critical consumables. Community care: targeted call on professionals and networks (CPTS) to open extra slots. Coordination: proactive redirection between community care and emergency departments.

Indicator	Target	Key actions
Under-load (≤ 3)	Optimizing human resources	Hospital: keeping staff on site, reallocation to ancillary activities (training, meetings, internal projects). Principle: maintain care capacity; the prediction of under-load must be validated before any reduction, ancillary activities being interruptible at any moment.
Correction	Limiting the impact of errors	If excess load overestimated: stocks built up can be carried over, on-site or on-call staff not called on but available (service quality maintained), a case study launched to improve the system.

Innovation and Benefits for Several Parties

Key Innovation

- **Methodological break:** a move from reactive management (responding to the crisis) to a data-driven strategic anticipation, prioritizing preventive actions.
- **Modularity:** a model adaptable to territorial specificities (adjustment of granularity and parameters).
- **Community-hospital hybrid:** creation of a shared language and vision, fostering collaborative responsibility and regulation.

Expected Benefits

Stakeholder	Impact
Patients	Faster access to care, better referral, fewer inappropriate visits to emergency departments, reinforced territorial equity.
Professionals	Schedules better adapted to the real load, less stress linked to being overwhelmed, greater value placed on the role of regulator.
Establishments and ARS	Financial optimization (lower emergency and overstaffing costs), better stock management (fewer orders delivered urgently), objectified strategic steering.
Health system	Decongested emergency departments, greater resilience in health crises, creation of a data reference base for research.

Deployment and Conditions of Success

Implementation Approach

1. **Pilot / test phase:** choice of a restricted territory, rigorous back-testing on historical data.
2. **Industrialization phase:** robust technical architecture (security, GDPR and HDS compliance, storage), continuous integration, and deployment at scale.
3. **Continuous improvement:** adjustment of the models, progressive territorial extension and national interoperability.

Governance and Risks

Governance: shared steering committee (ARS, hospital management, representatives of self-employed health professionals, data scientists).

Risks:

- *Technical:* data quality (validation and cleaning necessary), model drift (automatic alert mechanism).
- *Adoption:* resistance to change (requires co-construction and teaching).
- *Regulatory:* GDPR compliance and anonymization of the data (prevalence of log data).

Key Performance Indicators

Category	Indicator	Value (as an example)
Accuracy	Mean absolute error (MAE) or MAPE	≤ 10 %
Reliability	Rate of false positive or false negative alerts	< 15 %
Use	Adoption rate among professionals	> 70 % at 12 months
Operational	Reduction of excess load or under-load episodes	−30 % at 12 months
Quality	Forecast generation time	< 5 minutes
Actual	Survey of the delays and rates found in the field (observed effects)	Average wait per day: 45 min; inactivity rate: 30 %

Long-Term Vision

SASactiv is a lever of cultural transformation. By relying on data, it invites professionals to anticipate rather than react, and to collaborate more closely. The project lays the foundations of an anticipatory, data-guided health system, capable of adapting proactively to needs, thus ensuring a more agile and resilient steering of unscheduled care in France.

Prospects of Evolution

- Extension of the forecasting horizon (7 to 14 days) for strategic planning.
 - Adaptation of working arrangements (on-site on-call duty to adapt the schedule to situations of under-load).
 - Integration of advanced epidemiological and meteorological data.
 - Pooling and interconnection of models at the national level.
 - Application to other sectors (psychiatric emergencies, medical transport).
 - Development of explainable AI (XAI) for greater transparency of decisions.
-

Landmarks

For the status of the project and its relation to the book of practical application, see *The Canal and the Workshops*, chapter 5 (hospital health), which deals with the health sector from a complementary angle (intra-hospital, where this document deals with the inter-organizational).

For the concepts used in this document, see the trilogy *Tried by the Flow*: Tome 1 *The River and the Canal* (flow of observation, optimum, two times, lapse and validity for a use, loop, intentionality), Tome 2 *From Spring to Torrent* (propagation, transport as a relation, multiplication by copying, collective wisdom, stable sources), Tome 3 *The Trace or the Datum* (act of reading, situated reader, three paths, reader's window).

For the stand-alone note that forms the retrospective counterpart of this document, see *The LLM as a Systemic Leap in Storage*. The two notes — one on a case of the present in the process of transforming reception, the other on a forward-looking case in the process of building a collective intelligence — form a teaching pair: what the grid makes it possible to think in the two temporalities of the contemporary moment.

For the second forward-looking case — resilience and positioning through observation —, see *Locating Oneself in the Noise of the World: the PPE Case*. SASactiv and PPE form a **constructive pair**: one shows the grid in the service of anticipatory pooling, the other in the service of resilience through distributed observation.

Document written in June 2026.

Locating Oneself in the Noise of the World

The PPE Case — Positioning by Signal Fingerprint

“One does not pick a datum; one digs a canal in the river, and the datum is the water one draws from it.”

— *The Canal and the Workshops*, chapter 1

Preamble — Status of This Document

This document complements the book *The Canal and the Workshops* — it extends its demonstration without being one of its chapters. Like the SASactiv case, it offers a **practical exercise**: not an existing case to be analysed retrospectively, but a model project to be designed, worked out to serve as an example. With it, there are now two constructive cases that the toolkit sets side by side — one turned towards coordination and prediction, the other towards resilience and the reading of the territory in its signals.

The project presented — PPE, a system of positioning by the fingerprint of ambient radio signals — is not a project under way. It is a forward-looking sheet. It is, in principle, feasible: but its implementation would presuppose a territorial will that is not the object of this book, and it would require, like any implementation, adjustments that this document does not claim to settle. Its value is not in the assessment of its operational feasibility, but in what it makes it possible to illustrate: how the processual grid can **equip design**, and above all how it makes it possible to **distinguish what consolidates a project from what exposes it to failure**.

A clarification of name and family is needed at once, for it governs all the rest. The project is named here **PPE**, for *positionnement par empreinte* — in English *Fingerprinting Positioning System* (FPS). It does not belong

to the *Broadcast Positioning System* (BPS), in which transmitters would deliberately broadcast a positioning timestamp: in the latter, the transmitters are themselves an apparatus of observation. The PPE, for its part, presupposes no cooperation from the transmitters; it passively observes the radio signals already present — not designed for navigation — and estimates a position by matching against a georeferenced map. This distinction is not one of vocabulary: it is ontological, and it is what makes the case fruitful. Where a system with cooperating transmitters would itself be an apparatus of observation, the PPE takes the **electromagnetic landscape** for what it is: not a natural given, but an involuntary work of humans — the sedimented resultant of transmitters installed one by one, each for its own ends, which no one coordinated or intended as a whole. It is precisely this layer of unformalized human activity that the PPE treats as a fragment of the **flow of the real**: given, and indifferent to any intention of location, although it is made through and through. It is there that it digs a canal — and it is the purest illustration one can give of the founding gesture of the observational route.

Part I — Why a Second Forward-Looking Case

The book *The Canal and the Workshops* went through a series of existing sectors, in retrospective reading. The SASactiv note showed that the grid also serves to **design** a project that does not yet exist. The present document confirms this constructive dimension on very different ground: no longer health and the anticipation of load, but positioning and resilience.

The change of ground is not gratuitous. It brings out a gesture that SASactiv did not show: the **conversion of a flow of observation into a code of reading**. The PPE is built with a satellite positioning system (GNSS) in working order — which provides the reference position of each entry — and aims to remain operative when that same GNSS comes to be lacking. What one first observes, one then learns to *read* without the instrument that had served to observe it. None of the sectors of the book, nor SASactiv, brought this turning around fully to light.

Four axes, already set out for the first forward-looking case, structure the illustration and hold, mutatis mutandis, for every project of this nature:

Inter-organizational coordination. A fleet of vehicles, each keeping up its own flow of observation, feeds a map that no vehicle could make alone.

Prediction and its relation to freshness. Once the GNSS is lost, the position read is no longer an observation but a **verisimilar datum**; and the map itself must anticipate the state of the signals it annotates.

The design ex nihilo of a flow of observation. Which bands to capture, at what cadence, with what processing: these choices, which one diagnoses in others, are here at the starting point.

Collective intelligence as pooling. The map is a shared fact, which multiplication by copying makes available to all without dispossessing anyone — and which can, in time, tend itself.

Part II — The PPE Project in Brief

The PPE aims to provide a fallback geographical positioning, independent of satellites, from the radio signals alone that a receiver can capture in a given place.

The principle rests on a simple physical finding: at each point of a territory, the set of radio signals received — each with its own **frequency** and **intensity** — forms a combination that, as long as it is rich enough, identifies this point almost uniquely. Emitted from fixed positions of the territory, these signals outline a local **fingerprint**. Associating this fingerprint with a known position, in a great many places, amounts to building a map: a matching between *what one hears* and *where one is*.

The building of the map happens in two regimes. In the **bootstrapping regime**, a mobile receiver equipped with a working GNSS travels across the territory and inscribes, at each entry, the pair “signal fingerprint / GNSS position”. The GNSS plays in it the role of reference instrument: it is what provides the truth of position that the fingerprint, alone, would not give. In the **tending regime**, the existing map serves in its turn as reference: a receiver that relies on it can estimate its position without GNSS, detect the gaps between what it hears and what the map expects, and contribute to correcting it. The system is designed to **tend itself**: bootstrapped by the GNSS, it must then hold through its own functioning.

The device is intended to equip fleets of vehicles — transport operators, territorial services — so that the map is kept up to date by their very circulation, and, in time, to fit into a transportable module capable of giving back a position from the signals received.

The primary intention is **resilience**: having a means of location when satellite positioning is degraded or destroyed — jamming, conflict, or massive failure of the solar-storm type. The precision aimed at is not that of a GNSS, and the project does not claim it; it will be seen that this lesser precision is not an absolute defect, but a magnitude to be related to the use.

This factual presentation is enough for what follows. The following parts examine it through the grid of the three phases.

Part III — Reading through the Three Phases

In the First Phase — Making

Each vehicle keeps up a **flow of observation** whose object is not traffic, nor people, but the radio landscape of a territory. Its **intention** — building a resilient means of location — gives rise to **criteria**, each of which deserves to be named, for they are, in the words of the first tome, *the signature of intention in the flow*.

The first criterion is the **scope of the bands**. The project retains the signals that can be held, at the scale of use, to be **stable sources**: broadcasting transmitters (AM, FM), mobile telephone networks (4G, 5G), whose position is fixed and whose presence is lasting. It excludes unstable signals — home Wi-Fi networks and other short-lived transmitters — whose volatility would ruin the fingerprint. Stability, here, is not an intrinsic property but a **ratio of speeds**, in the sense of Tome 2: these sources seem fixed because the real they mark — the siting of the transmitters — moves away very slowly. This is what makes them integrable into a map that one does not have the means to refresh at every instant.

This criterion also carries the **probity** of the project, and it is here that it must be set out. The flow of observation draws only what serves to build the pair “signals / position”: a frequency, an intensity, a location. It identifies no device, captures no content, follows no person. The object observed is the **fixed infrastructure** of a territory, never its users. This restriction is not a moral supplement added afterwards: it is a criterion, and therefore a part of the intention. A flow whose criteria exclude by construction any identifying datum is a flow whose intention has probity — and the datum produced can be held to be anonymous because it contains nothing other than what positioning requires.

The second criterion is **cadence**. Recording all the signals continuously would produce an unmanageable volume — an **over-throughput** at the source. The relevant cadence is not a fixed frequency but a **threshold of variation**: an entry is inscribed only when a signal appears, disappears, or sees its intensity cross a representative step. Between two significant variations, the radio real has said nothing that deserves inscription. The map feeds on *changes*, not on a repetition of the identical.

The third criterion is the **referential neighbourhood** of each entry. An isolated pair “signals / position” is hard to interpret; it must be accompanied by its context — timestamp, and the metadata likely to explain a variation: pressure, temperature, time of day. This corpus of context is what will make it possible, later, to distinguish a signal *weakened by the storm* from a signal *lost to a breakdown*. Without it, the same drop in intensity would remain undecipherable.

Processing is done **at the source**, in the on-board equipment: the vehicle does not transmit a raw stream, but **consolidated data** — the pairs that

are really useful, already filtered by the threshold of variation. It is an exemplary choice of **observational optimum**: under-drawing would leave holes in the map; over-drawing would drown the system under worthless entries. The optimum lies in the calibration of the steps of variation, specific to each band.

In the Second Phase — Circulation

The PPE is, in its essence, a project of **propagation** in the sense of Tome 2. A fleet of vehicles, each keeping up its flow, makes separate entries converge into a map of a higher level from which each benefits whereas none could have made it alone. It is a **distributed representation of the flow of the real**: not a centralized stock, but a fabric of canals tended in parallel.

Multiplication by copying plays fully here, and it is what makes the system possible. The map produced is shared among all the carriers without any of them being dispossessed of it: *it is shared like a fact*. A vehicle that transmits its entry keeps the use of it; a receiver that receives the map deprives no one of theirs. If the map were deposited with a single holder, there would be no resilience — only one more dependence.

The risk proper to circulation is here the **loss of context**. A fingerprint transported far from its place and time of making can be read without access to the criteria that produced it — the band captured, the threshold of variation, the weather conditions of the entry. A map delivered without its conditions of production is a map one believes one reads better than one does. Each fragment of map should therefore carry its signature of making: on what date, under what conditions, with what criteria it was established.

In the Third Phase — Reception

It is in the third phase that the announced turning around takes place. As long as the GNSS works, the position is **observed**: the receiver receives it from an instrument. Once the GNSS is lost, the position becomes **estimated**: the receiver perceives the ambient signals and **deciphers** them by means of the map, which now plays the role of **code of deciphering**. The fingerprint captured is, without this code, a **mute datum** — received, but illegible; with it, it translates into a position. The receiver occupies there a situated position of handling or processing; the location it calculates is actualized for whoever reads it, driver or operator. The map, the product of a flow of observation in the first phase, has become the corpus that makes reading possible in the third.

This deciphering has a **depth relative to the map**, as every deciphering has one relative to the reader's corpus. Where the map is dense and fresh, the position is read finely; where it is patchy or stale, the deciphering thickens with uncertainty, or fails.

Hence the question of the **reader's window** and of use. The PPE receiver delivers a position less precise than a GNSS. But the relevant criticism, as the first tome establishes, does not concern fidelity — always relative to criteria — but the relevance of the criteria *for the intended use*. To follow the progress of a vehicle along a trip, to know that it is advancing and where it is to within a few tens of metres, this precision is enough. To drive this same vehicle autonomously, it is not enough. It is not the same window; it is not the same use. The range of uses the PPE can answer is deduced from its strengths and weaknesses, not from an absolute comparison with the GNSS.

The way in which the datum of the map **goes stale** for positioning is central here, and it is what carries the main fragility of the project. A signal expected by the map but absent from the entry indicates that something has changed: the relay no longer transmits. This absence is not a void — it is informative. Depending on its referential neighbourhood, it is deciphered as a **breakdown** (a brief and localized absence), as a **constraint** (a weakening correlated with a storm, heat, a crowd) or as a **lasting disappearance** (a transmitter dismantled). It is the very mechanism by which the map learns that it is going stale — but it is also what can make it fail if variations accumulate faster than it integrates them.

Part IV — Four Axes That the Case Sheds Light On

Inter-Organizational Coordination

The PPE makes sense only collectively. An isolated vehicle produces only a thread; it is the fleet that produces a map. But making flows kept up by distinct actors converge — transport operators, territorial services — presupposes the same upstream work as SASactiv: making the flows **compatible**. The same bands captured, the same thresholds of variation, the same fingerprint format, the same position reference at bootstrapping. Without this agreement, the aggregation produces a map that says less than one believes it says — fingerprints inscribed according to disparate criteria do not match.

This difficulty is generic: it would be found in any pooling of independent observations. The processual grid helps to see it, by recalling that a flow is interoperable with another only if their criteria — and therefore their intentions — have been made commensurable.

Prediction and Its Relation to Freshness

This is the axis on which the case is most instructive. Once the GNSS is lost, the position read is a **verisimilar datum**, not an observation: it relates not to an instant of the real but to a state estimated from the map. And the map itself, to remain operative, must anticipate the state of signals that it

can no longer confront with a ground truth. Maintaining a map without GNSS is keeping up a verisimilitude.

Four conditions make this maintenance possible, and their absence is what would lead the project to failure.

Stability. Not all signals vary at the same speed. Identifying those that do not change in the short term — the most stable sources — provides the framework of the map, the base that requires no refreshing.

Durability. The variations of the other signals must be followed and modelled, so that an expected weakening — the one a storm causes — does not invalidate the reading. It is the referential neighbourhood (weather, time of day) that makes it possible to integrate the event rather than undergo it.

Reliability. One must estimate how many concordant signals are needed to fix a position. This redundancy is what makes it possible to lose a signal without losing the location: if the position remains determined by the remaining signals, the absence of a transmitter does not make the reading fail — and the map can even, by cross-checking, correct on its own the entry of the signal that has drifted. It is in this way that self-tending becomes possible.

Removing ambiguity. Two distant places can carry similar fingerprints. The *temporal* referential neighbourhood dispels this: the vehicle moves according to known physical constraints. If the ambiguity sets against each other two positions one of which is tens of kilometres from the position read a minute earlier, physics settles it — no attainable speed could have taken it there. The previous position is part of the corpus that deciphers the present position.

Freshness, here, can no more be recovered than elsewhere: a map is kept up to date only by the continuous circulation of a fleet that re-inscribes the radio real. A frozen map goes stale, for positioning, as the landscape it annotates drifts.

The Design Ex Nihilo of a Flow of Observation

The PPE shows design in its pure state, for everything in it is to be chosen. One starts from the **question of use** — a fallback means of location for tracking movement — from which one deduces the **necessary fineness**: a precision of the order of ten metres is enough, which relaxes the requirements on the density of the map accordingly. From it one deduces the **instrument** (a wideband receiver), the **scope of the bands** (stable sources only), and the **cadence** (by steps of variation). One checks that the whole holds — a sustainable volume of data, processing at the source — and one relaxes the fineness where cost requires it. This is, feature for feature, the work of **observational optimum** of the first tome, carried out not in diagnosis but in design.

Collective Intelligence as Pooling

The deepest point, as for SASactiv, is here. The map is a good that multiplication by copying makes available to all without dividing it. But the PPE pushes the idea one notch further: pooling serves not only to *produce* the map; it serves to *tend* it. Each receiver that estimates its position and finds a gap between what it hears and what the map expects is, potentially, a contributor to its correction. The distributed representation is no longer only richer than what one actor would produce alone; it is **self-correcting**, through the cross-checking of multiple windows.

This intelligence has its conditions, which the grid names: compatible flows, traceability back to the criteria of each fingerprint, a shared probability of the contributors (each maintains their flow rigorously), and a governance that answers for the map without anyone owning it. These conditions are not given; they are built, and their building is precisely what implementation should provide for.

Part V — Limits and Open Questions

This document does not deal with everything, and it must be said so that it does not claim to be more than it is.

It does not deal with the **operational viability** of the PPE. The necessary fleet density, the precision really attainable, the holding of the map over time: these questions belong to an engineering and experimental study that this document, which stays at the conceptual level, does not carry out. It points to the conditions of success and the points of failure; it does not measure whether they are, in practice, satisfied.

It does not deal with the **territorial dimension**. Implementing the PPE presupposes a will at the scale of a territory — mobilizing fleets, coordinating actors, keeping up a common map — which is not the object of this book. One will note only that such a device could, elsewhere, illustrate what a programme for institutionalizing local data could give rise to — on the express condition of setting its limits, and first of all the one that separates the location of infrastructure from any observation of persons. This boundary, held here by the criteria of the flow, should be held there by doctrine.

It does not deal with the **alternatives**. The PPE is *one* resilience project among others — other approaches exist for the same need. This document does not elect it as the right solution; it uses it as a support to show how the grid sheds light on the design of a system of positioning by observation, and where its fragilities lie. Other model cases could be analysed in the same way, and eventually feed a corpus of forward-looking illustrations.

It does not deal with the **second death of the datum**, which must nevertheless be pointed out. A map designed as a backup against a catastrophe

must resist not only **lapse** — the moving-away of the real it annotates — but **disappearance**: a format become illegible, a degraded medium, a map made inaccessible at the precise moment one would need it. A resilience backup that did not survive the crisis it anticipates would miss its reason for being. Care for this second death belongs to *Technical Data*; it is named here, not dealt with.

These acknowledged limits give the document its right measure: it shows how the grid can equip the design of a project of positioning by fingerprint, and distinguish what consolidates it from what would expose it to failure. The rest belongs to other works.

Conclusion — The Grid as a Design Tool

The PPE will have served, like SASactiv, as the support for a demonstration: processual ontology is not only a diagnostic grid; it equips design. But this second case adds to the first a lesson of its own. It shows that a flow of observation can, once constituted, **turn around into a code of reading** — that what one has learned to observe with an instrument, one can learn to read without it. This is the very form of resilience that the trilogy makes it possible to think: not a second system that would duplicate the first, but a map that survives the loss of the instrument that made it.

Designing the PPE is digging, in the indifferent noise of the radio real, a canal that makes this noise legible as a position. Tome 1 taught how to dig; Tome 2 how to articulate and share; Tome 3 how to read what arrives at the end, and to recognize when nothing is actualized. The present document, starting from a case, shows that the three teachings are simultaneously tools of design — and that lucidity about the fragilities of a project is worth as much as enthusiasm for its promises.

The grid does not say whether the PPE should be undertaken. It equips whoever has decided to undertake it, and warns them of what would make them fail.

Appendix — PPE Project Sheet

PPE — Back-Up Positioning by the Fingerprint of Radio Signals

Name. PPE, *positionnement par empreinte* — in English *Fingerprinting Positioning System* (FPS). To be distinguished from the *Broadcast Positioning System* (BPS), with cooperating transmitters.

Status. Forward-looking sheet. A project feasible in principle; not undertaken. Dated document; the technical examples are contingent and

revisable.

Intention. Provide a fallback geographical positioning, independent of satellites, robust to jamming and to massive GNSS failure.

Principle. In each place, the combination of the radio signals received (frequency, intensity) forms a fingerprint that identifies this place almost uniquely. The map is the matching “fingerprint / position” established at many points.

Two regimes. - *Bootstrapping*: a receiver with a working GNSS inscribes the pairs “fingerprint / reference position”. - *Tending*: the existing map serves as reference; receivers estimate their position without GNSS and contribute to correcting the map. The system tends itself through the circulation of the fleet.

Criteria of making. - *Bands captured*: stable sources (AM, FM, 4G, 5G). Exclusion of unstable signals (Wi-Fi and short-lived transmitters). - *Cadence*: by threshold of variation (appearance, disappearance, intensity step), not continuously. - *Referential neighbourhood*: timestamp, pressure, temperature, time of day — to distinguish a circumstantial weakening from a lasting disappearance. - *Processing at the source*: the on-board equipment consolidates and filters; it does not transmit a raw stream. - *Probity/scope*: only frequency, intensity and position are drawn. No identifying datum; object observed = fixed infrastructure, never persons. Data held to be anonymous by construction.

Four conditions for maintenance without GNSS. 1. *Stability*: identify the signals that do not vary in the short term. 2. *Durability*: follow and model variations (weather events). 3. *Reliability*: determine the number of concordant signals needed for a position, to absorb the loss of a signal. 4. *Removing ambiguity*: use the previous position and the physical constraints of movement to rule out impossible similar fingerprints.

Intended uses. Tracking movement and physical transportation (progress of a vehicle, position to within a few tens of metres). Out of scope: autonomous driving and any use requiring GNSS-level precision.

Points of fragility identified. Unfollowed drift of the signals (lapse); fingerprint ambiguity; over-throughput if the cadence is badly calibrated; disappearance of the map itself at the critical moment (second death); incompatibility of flows between contributors.

Landmarks

For the status of the project and its relation to the book of practical application, see *The Canal and the Workshops*, chapter 8 (physical transportation and mobility), which deals with mobility and observed vs estimated po-

sition from a sectoral and retrospective angle, where this document proceeds by design.

For the concepts used, see the trilogy *Tried by the Flow*: Tome 1 *The River and the Canal* (flow of observation, criteria as the signature of intention, relative fidelity to criteria, observational optimum, over-throughput, referential neighbourhood, the two deaths of the datum and validity for a use, distributed representation of the flow of the real); Tome 2 *From Spring to Torrent* (propagation, multiplication by copying, the datum that is shared like a fact, stable sources as a ratio of speeds); Tome 3 *The Trace or the Datum* (act of reading, code of deciphering, mute datum, reader's window, three paths).

For the twin forward-looking case — coordination and prediction in health —, see *Designing a Project in the Light of Processual Ontology: the SAS-activ Case*. The two notes form a constructive pair: one on anticipatory pooling, the other on resilience through distributed observation.

Document written in June 2026, to be tested by practice.

Data Literacy — State of the Field

Genealogy, Frameworks, Actors, Tensions: the Field in Which the Trilogy Took Its Footing

This note is the state of the field that Tome 1 originally set out in its second document, and that a synthetic chapter now replaces there. It takes on here its exact status: a **dated reference point**. The theoretical foundations and the genealogy it traces are stable; the institutional frameworks, the actors and the figures are situated in time, and bound to evolve — the note is revised at its own rhythm, without committing the substance of the tome. One fact, however, will not go stale: annotation will produce a datum; it is a fact of yesterday, today and tomorrow. And as long as humans remain human, they will annotate — and will sooner or later ask themselves what it means to know how to read what they have written.

Part I — Literacy: a Long Genealogy

At the Origins of the Word

The word *littératie*, modelled in French on the English *literacy*, derives from the Latin *littera* — the letter. In its strictest sense, it designates the capacity to read and write in an alphabetic system. For most of human history, this capacity was a privilege reserved for a ruling elite, which derived from it — as the anthropologist Jack Goody showed — an essential part of its power. It spread gradually: in the middle of the twentieth century, fewer than six adults in ten could read and write worldwide; at the beginning of the twenty-first century, more than eight in ten. This movement of a century is reminiscent of what Tome 1 examines in *From the Notch to the Algorithm*: what was the preserve of a few becomes, with time, a common good.

Literacy is nevertheless not a frozen reality. Three great conceptual transformations have, since the middle of the twentieth century, profoundly renewed its meaning.

Functional Literacy

The first break is that of *functional literacy*. In 1956, the American educator William S. Gray, in a report written for UNESCO, defined literacy as an adult's capacity to respond autonomously to the reading and writing demands placed on them. The Second World War had brought to light that hundreds of thousands of conscripts were unable to understand elementary written military instructions. Literacy left the domain of culture to enter that of social competence.

In 1978, UNESCO went a step further: *functional literacy* now designates the capacity to engage in all the activities in which reading and writing are necessary for the functioning of a community, and to enable the individual to continue to develop through these competences. Three keywords emerge: *context, autonomy, participation*. Literacy is no longer only a technique — it becomes an instrument of emancipation. This inflection carries the mark of the Brazilian educator Paulo Freire, whose *Pedagogy of the Oppressed* (1968) theorizes literacy teaching as a political act: learning to read the world before learning to read the words.

The Constellation of Literacies

The second transformation is the splintering of the concept. As societies grow more complex, a constellation of *specialized literacies* appears: media literacy, which extends the work of Marshall McLuhan; information literacy, defined in 1974 by Paul Zurkowski; statistical literacy, popularized from the 1990s by Milo Schield; digital literacy, introduced in 1997 by Paul Gilster.

This proliferation has sometimes been criticized: every technical domain could claim the label *literacy* to acquire educational legitimacy. But it also reflects a sociological reality: the growing complexity of societies requires competences of critical reading that mastery of the alphabet alone no longer covers.

In 2003, UNESCO consolidated these developments in a broadened definition: literacy is the capacity to identify, understand, interpret, create, communicate and compute, using varied materials, in varied contexts — in order to participate fully in social life. It is within this framework, and starting from information and statistical literacies, that the concept of data literacy emerged at the beginning of the 2000s.

Part II — The Birth of Data Literacy

Before the Word: Datalogy

Before the term *data literacy* was fixed in academic literature, an older discipline already carried its intentions, without knowing its name. In 1966,

Peter Naur — a Danish astronomer who became one of the pioneers of European computing — proposed the word *datalogy* to replace the expression *computer science* (letter to the *Communications of the ACM*, July 1966). The change concerns the object: datalogy studies data and the processes that transform them, and it does not depend strictly on computers. Data belong, like language and mathematics, to the signs and symbols that humans have invented to help themselves.

Datalogy is defined as the science of the nature and use of data. Its educational ambition is explicit. In an article of 1966, then in radio lectures published in 1967 under the title *Datamaskinerne og samfundet*, Naur wants to bring it into schools, like reading and writing, to prepare everyone to live in the age of computers. Teaching would concern data, their representations and processes; computers would come only at the end. Naur expects from it that the mystique surrounding computers will dissipate, and that their control will cease to be the business of a small group of experts and become an ordinary political question. As early as 1966, he refuses that people should give up understanding in order to entrust everything to experts. These are the objectives that data literacy will set itself some thirty years later, most often without citing Naur. Datalogy remains a *subjugated knowledge*: an accomplished discipline that the literature of the field has erased from its own genealogy. Recognizing it is recalling that the concern to train individuals in the understanding of data long precedes the word that designates it today.

The Founding Moment

The birth certificate most often cited is an article published in 2004 in the journal *IASSIST Quarterly* by Milo Schield: *Information Literacy, Statistical Literacy, Data Literacy*. Schield makes a conceptual distinction that will remain foundational: information literacy concerns *sources*; statistical literacy, *reasoning*; data literacy, between the two, concerns the *raw material* itself — its selection, its transformation, its manipulation, its presentation. The value of a statistic, Schield writes, is heavily influenced by the way the underlying data were selected, converted and manipulated. It is the first operational formulation of what will be meant by *data literacy*.

The Anchoring in Teaching

From 2008, the American researchers Ellen Mandinach and Edith Gummer rooted the concept in teaching. Their work on *data literacy for teachers* defines it as the capacity to transform information into actionable knowledge. Their framework, articulated in five dimensions ranging from the identification of the problem to the evaluation of the results, will profoundly influence teacher training policies in the United States and their international transposition.

In 2015, a Canadian team led by Chantel Ridsdale produced the first systematic review of the literature on the subject and proposed a concep-

tual framework in four domains: the *collection* of data, their *management*, their *evaluation* and their *application* — probably the most detailed academic framework and the one most taken up in later work.

The Critical Current

In parallel with these techno-pedagogical approaches, a critical current developed at MIT around Catherine D'Ignazio and Rahul Bhargava. Inspired by Freire's pedagogy, their proposals emphasize an *empowering literacy*: enabling the populations concerned by data — and not only the experts who handle them — to understand, contest and orient their uses. Their operational breakdown of literacy into four verbs — to *read* data, to *work with* it, to *analyse* it, to *argue with* it — will be one of the most cited in the field. It subtly shifts the emphasis: the datum is not only an object to be mastered; it is a material from which one can build a story, defend a position, act in the world.

A Consolidated Definition

At the crossing of these traditions, a consensus definition gradually emerges. Data literacy is the knowledge of what data are, of how they are collected, analysed, visualized and shared, and the understanding of how they are used — judiciously or not — in a given cultural, ethical and legal context. To this is added a civic dimension formulated precisely by a group of researchers in 2015: data literacy is *the desire and ability to constructively engage in society through or about data*. The formula *through or about* matters: it is not only a matter of using data as a tool, but of reflecting on data themselves as a social, political, economic object.

Part III — Theoretical Foundations

The Pyramid of Levels: Why the Datum Is Not Information

Data literacy rests on a hierarchical distinction often represented in pyramidal form — known by the acronym DIKW for *Data - Information - Knowledge - Wisdom* — popularized by Russell Ackoff in 1989: the datum is a raw sign, an isolated fact; information is a datum put in context; knowledge integrates information into a system of interpretation; wisdom is the capacity to apply this knowledge judiciously in a singular situation.

This representation, despite the criticisms it attracts — Leonelli's cycle, which proposes a relational and non-hierarchical vision of data integrated into a research process, is an important alternative to it —, remains a central teaching tool. It recalls that a datum without context means nothing, and that data literacy is not only mastery of the lowest level, but the capacity to move between the levels — and above all not to confuse them with

one another.

And the datum itself is not a *given* fact but a *captured* fact. The philosopher of science Kaplan noted it as early as the middle of the twentieth century: it is not nature that supplies the datum to the researcher; it is the researcher who captures it in nature according to their aims and frameworks. Speaking of raw data or of objective data is an oxymoron. Every datum carries the choices of those who produced it: the phenomena chosen to be observed, the instruments used, the measurement thresholds applied. Understanding this is the first act of literacy — and it is the point from which the crossing of Tome 1 starts.

The Three Traditions

A retrospective reading of the field makes it possible to identify three great intellectual traditions that meet in contemporary data literacy.

The statistical tradition, descending from Graunt, Quetelet and Tukey, insists on mastery of probabilistic reasoning, critical reading of public figures, detection of reasoning errors — Simpson's paradox, selection bias, confusion between correlation and causation.

The library and documentary tradition, descending from the *information literacy* of American librarians of the 1980s, emphasizes the chain of information: sources, metadata, verification, documentary quality. It is the tradition that carried the concept into universities and schools.

The critical and political tradition, descending from Freire and *cultural studies*, questions the power relations, economic structures and social biases that lodge in data.

None of these traditions exhausts the concept on its own. Data literacy, in its most accomplished frameworks, articulates all three: technical, documentary and critical.

Levels of Competence

The professional world has developed its own gradations to map training needs, from basic awareness of the vocabulary to the capacity to carry out complex analyses in several fields of activity. The linguistic metaphor is omnipresent in this literature: people speak of *speaking data*, of a *common language*, of *fluency*. It is heavy with educational consequences — and with political questions that we shall see again further on.

Part IV — Data Literacy as a Boundary Object

A Concept with Several Faces

Data literacy is a *boundary object* — an entity whose interpretive flexibility allows it to be appropriated simultaneously by different professional communities, without losing its overall coherence, but without producing either a consensus on its exact content. This is not a defect of the concept. It is the reason for its success and for its contradictions. A data officer in a company, a school librarian, a community activist and a researcher in education sciences do not mean exactly the same thing when they say *data literacy* — but they are indeed speaking of the same object.

This is why the thesis that research tends to validate is that of the *plural*: one should speak of *data literacies* rather than of a single *data literacy*. The visions built over twenty years do not converge on a unified object — they coexist, cross, confront one another. In companies, data literacy is often a productive competence. In education, a cross-cutting competence. In civic movements, a condition of democracy. These three visions are not incompatible, but their educational priorities and their political implications really are different.

From this plurality, specializations have emerged: *journalistic* data literacy, centred on investigation and verification; *scientific*, centred on reproducibility; *civic*, centred on participation; *professional*, centred on decision. Each carries distinct training programmes. This profusion indicates that the question raised by the datum runs through all the spheres of contemporary human activity, without any of them owning it entirely.

Part V — The Institutional Frameworks

As data literacy established itself as an educational and civic issue, institutions undertook to formalize it in competency frameworks. This movement is itself under way: the frameworks are regularly revised, absorbing at each update the new forms of the relation between individuals and data.

The most structuring framework at the European level is the *Digital Competence Framework for Citizens* (DigComp), developed by the Joint Research Centre of the European Commission. Its first version dates from 2013; it articulates 21 competences in five domains, the first of which explicitly concerns information and data literacy. The successive versions have gradually integrated artificial intelligence. In France, this transposition takes the form of the *Cadre de référence des compétences numériques* (CRCN), put into operation by the PIX platform.

Other actors are moving into this ground: data protection authorities (the CNIL in France contributed to an international framework structured in nine domains), UNESCO (which favours an approach rooted in media and

information literacy, and has published frameworks on artificial intelligence for teachers and pupils), Statistics Canada (which formalized an operational definition for civil servants), the OECD (which integrates dimensions of reasoning with data into its international surveys).

To follow the current state of these frameworks — versions, pathways, certifications —, see the *Annotated Bibliography* of Tome 1. This movement of institutional formalization says something important: the question is no longer *whether* to train people in data. It is *how*, with *what objectives* and *for whose benefit*. And that question will not be settled once and for all.

Part VI — The Ecosystem of Actors

Institutions, Research, Civic Actors, Private Actors

At the top of the pyramid of actors, the major international organizations each contribute with their own logic: UNESCO with a humanist and inclusive approach, the European Commission with its competency frameworks and its massive training programmes, the OECD with its tools for measuring adult competences.

In the academic world, several poles structure the field. MIT produced part of the most cited work on critical and creative approaches. Canadian universities contributed the most rigorous literature reviews. In France, a network of researchers in information and communication sciences — around Anne Lehmanns, Camille Capelle and others — has been conducting, since the beginning of the 2020s, action research on data literacy in education.

An essential part of the critical and civic dimension of data literacy is carried by non-profit organizations: organizations that train journalists, activists and civil servants in the use of open data; investigative media that have made data journalism a mode of public literacy; associations that connect volunteer experts with civil society organizations; open data portals. These civic actors share a conviction: data literacy is not only a professional competence. It is a condition of democratic participation.

The analytics software world moved into the ground very early, with a mixture of educational and commercial intentions. Vendors created joint non-profit projects, commissioned studies on the data skills gap, offered freely accessible tests and resources. The results of these studies converge: at the beginning of the 2020s, fewer than one employee in five declared themselves confident with data, and more than two senior executives in three said they were uncomfortable with them. These figures served both to measure the extent of the challenge and to justify commercial training offers.

This involvement of private actors is ambivalent. On the one hand, it de-

mocratized access to quality content. On the other, it orients literacy towards the vendors' tools — at the risk of reducing a democratic concept to a user competence, and of masking under the varnish of training the political issues it should make it possible to face.

For the precise references on these actors and the studies cited, see the *Annotated Bibliography* of Tome 1.

Part VII — Objectives, Tensions, Stakes

Three Great Families of Objectives

If one classifies programmes and literature by their declared purposes, three great families emerge.

The professional and economic purpose: literacy as a competitive and productive advantage. Organizations that master their data make better decisions, waste less time, make fewer costly errors. This logic, dominant in management literature, frames literacy as a human capital that can be put to value.

The educational and school purpose: literacy as a cross-cutting competence indispensable to success at school, to entry into working life and to adult civic participation. This logic — that of ministries of education, of UNESCO, of the OECD — frames literacy as a formative competence in the broad sense, analogous to what the German tradition calls *Bildung*.

The civic and democratic purpose: literacy as a condition of democracy in the digital age. Without it, citizens can neither understand public policies founded on data, nor contest problematic uses, nor take part in the governance of digital commons.

These three purposes are not mutually exclusive. But their respective emphases carry very different educational consequences. Every public literacy policy arbitrates, explicitly or not, between these orientations.

The Criticisms of the Concept

Five great criticisms run through the field.

Managerial co-optation: several researchers reproach the concept as disseminated by commercial vendors and consultancy firms with depoliticizing the issue by reducing it to a problem of individual training. The *data-literate* employee would be the one who adapts to the *datafication* of work — not the one who contests it.

Technical focus at the expense of ethics: institutional frameworks pay more attention to *understanding* data than to *acting with* them, and of-

ten favour a defensive posture — protecting oneself from data — at the expense of active citizenship competences.

The invisibilization of power asymmetries: standard programmes presuppose an abstract and neutral subject — whereas data almost always carry the mark of the social structures that produce them. A truly critical literacy must examine not only the data, but who produces them, for whom, with what intentions, and who remains invisible in the data produced.

The risk of a two-speed literacy: if data literacy becomes a civic and professional prerequisite, it can — like literacy teaching in the nineteenth century — create a new divide between those who master the codes and those who undergo them.

Conceptual inflation: the word *literacy* applies today to dozens of objects. The need to distinguish rigorously between information, statistical, digital, data and AI literacies is pressing — on pain of the concept, by designating everything, no longer meaning anything.

The Educational Challenges

Effective teaching comes up against well-identified difficulties. The abstraction of the concept of datum makes it hard to learn: concrete approaches, in which pupils themselves collect data on their own environment, are more effective than lectures. The cross-cutting nature of the concept — at the crossing of mathematics, computing, information sciences and the humanities — makes it hard to house in an established discipline. The training of teachers themselves remains limited. And the rapid evolution of tools obliges constant revision of the contents.

Part VIII — Permanent Reconfiguration

Data literacy is reconfigured at each significant transformation of the datum and of its processing systems. This was true when statistics became an academic discipline. It was true when personal computing brought databases within reach of an office. It was true when *big data* shifted the questions from quality to quantity. It will be true again.

The most recent wave at the time of writing is that of generative artificial intelligence models, capable of *reading, writing and reasoning with data* in a way that obliges us to reformulate what being *data-literate* means. The most useful distinction the field proposes is this: data literacy concerns the *materials*; AI literacy concerns the *systems* that learn from these materials. But in practice, the two intertwine: understanding the limits of a model requires understanding the nature of the data on which it was trained.

A great philosophical question ran through the field at the time it was written, and it will persist: if machines can now handle data better than

most humans, what is the point of training humans to do so?

The answer comes down to two propositions that stand the test of time. On the one hand, *using these machines intelligently requires precisely a data literacy*: knowing how to formulate a question, evaluate an answer, detect an error, cross-check sources, understand the limits of a system. Without this literacy, the user is prisoner of the machine, unable to measure its reliability. On the other hand, *collective decisions on the use of data remain human decisions*. The society that had entirely delegated its understanding of data to machines could no longer, strictly speaking, govern itself.

Conclusion — An Alphabet Being Written

In the age of printing and of modern states, knowing how to read gradually ceased to be a privilege and became a condition of civic participation. The parallel with the datum has its limits — one does not learn to read the datum as one learns to read the alphabet — but it indicates a direction.

Three conclusions stand the passage of time.

Data literacy is not a stable object. Born at the beginning of the 2000s at the crossing of statistical literacy, information literacy and media education — with, as an unrecognized precursor, Peter Naur's datalogy thirty years earlier —, it is constantly redefined as the object *datum* itself is transformed.

It is a field crossed by real political tensions. Between the managerial conception, the educational conception and the civic conception, actual programmes often lean towards the first, whereas democratic stakes would require a better balance. This tension is not a malfunction — it is constitutive of a concept that serves both the market and democracy.

It is now a public policy on an international scale. The question is no longer *whether* to train people in data, but *how, with what objectives and for whose benefit*.

Beyond institutions, there is perhaps a deeper reason to defend data literacy: it is one of the forms through which individuals can remain the *critical readers* of their own world — rather than its statistical extras. The datum makes each of us a recorded object. Literacy is what can make each of us a subject who reads and who questions.

But this definition still remains generic. The frameworks examined in this document — Schield, Mandinach-Gummer, Ridsdale, DigComp and their descendants — have a considerable merit: they formalized competences that did not exist as such. But they share a limit. None thematizes the *processual* nature of the datum. All treat it as an object to be handled.

It is this blind spot that Tome 1 takes as its starting point — and whose consequences it examines.

Landmarks

For the references used in this document — Schield, Mandinach and Gummer, Ridsdale, D'Ignazio, Verdi, Lehman, Naur, Ackoff, Star and Griesemer, as well as the institutional frameworks and civic actors —, see the *Annotated Bibliography* at the end of Tome 1, notably the sections “Data Literacy — Founding Texts” and “What Evolves and How to Follow It”.

Methodological Note — Statements Open to Refutation

Why This Note

The trilogy keeps its substance out of lapse **by construction**: its definitional statements — what a datum, a trace, a situated reader is — fix a vocabulary and a way of seeing; one can judge them fruitful or sterile; one does not refute them as one refutes a measurement. But the trilogy does not stop there: it also puts forward **existence statements** — it asserts that something is the case in the world. These are open to refutation, and it must be said openly: it is a strength, not a weakness. A structure that risks nothing anywhere says nothing anywhere. This note lists the main statements open to refutation, and what would refute them.

The Statements

The observational optimum (Tome 1). *The statement*: for every flow of observation, there is an optimal setting — drawing neither too much nor too little. *What would refute it*: a flow of observation for which it was shown that no setting dominates the others with regard to its use — that drawing more is always strictly better there, with no cost that ends up biting, or that all settings are of equal worth there.

The asymmetry of the leap (Tome 3, *The Properties of Reading*; Complementary Notes). *The statement*: transport and storage have had their leap of instantaneity and abundance; reading, for its part, has not had its own — it remains the bottleneck. *What would refute it*: a technique shown to accomplish **reading itself** — the situated encounter in which a reader actualizes a datum — and not its displacement (summary, sorting, delegation to another window). The criterion is demanding on purpose: delegating reading to a machine is not enough to refute the statement — the machine occupies a situated position of handling or processing, and nothing establishes that a meaning is actualized for it; one has inherited another situation, not abolished the bottleneck.

The self-amplification loop with two engines (Tome 2, document 7).

The statement: circulation gives rise to more circulation, and this loop has two engines. *What would refute it:* bringing to light a third independent engine — irreducible to the two named — or, conversely, showing that the two reduce to one.

How to Read a Refutation

If one of these statements fell, it would have to be withdrawn — and the structure would hold. For none of them carries the definitions: the datum would remain constituted by an act, the trace would remain legible real, the reader would remain situated. A refutation would touch what the trilogy **asserts about the world**, not what it **proposes for seeing it**. This is the very partition of the corpus: the definitional substance does not go stale, by construction; existence statements, for their part, live under the common regime of knowledge — exposed, dated in their confirmations, revisable in their formulations. The trilogy does not ask to be believed; it indicates where it can be caught out.

Translation choices

These notes say how to read the English words that render the terms of the corpus; they are fixed for the whole English translation by the *Translation Charter of the Corpus*.

- **datum / data.** The corpus treats the datum as an individual: constituted by an act, dated, carried by media. The translation therefore says *datum* in the singular and *data* as its plural, construed as a plural.
- **drawing / to draw** (*prélèvement, prélever*): the gesture of drawing from the flow, as one draws water. *Draw* is kept for this gesture; *derive* and *take* render the other senses of *tirer*. **Entry** renders *relevé*, the value inscribed at each measurement.
- **canal; canal-keeper** (*canal; canalier*): the canal dug in the river, never a *channel*; the canal-keeper is the one who digs and tends it.
- **lapse; stale** (*péremption; périmée*): a relation, not a decay; a datum goes stale *for a use*. **Validity for a use** is the measure of it.
- **the agreed; armature; envelope** (*le convenu; l'armature; l'enveloppe*): the shared conventions from which the structure of an activity is drawn; that structure; the support process that describes it and keeps it attuned. **Intended stability** and **undergone stability** keep apart a convention that holds by will and a source that drifts slowly of its own accord. **Tending** renders *entretien*, and *to tend* renders *entretenir*; *maintain* is kept for *maintenir*.
- **bearer / borne** (*portante / portée*): a datum that others exist only through, and those data; **shared fate** (*partage de sort*) is the mark of this dependence, against mere **reference**. *Bear* is kept for this pair; *porter sur* is rendered by *concern* or *apply to*.

- **instruction-driven function** (*fonction à consigne*): a function whose behaviour is fixed at each call by an instruction (*consigne*) written in natural language.
- **actualized** (*actualisée*): the act by which a reading produces a meaning, never the updating of a file. A **situated position of handling or processing** may be occupied by a human or a machine; a machine is an **actual reader** only if a meaning is actualized for it.
- **neglect; mute; dead** (*délaissement; muette; morte*): the datum that no one reads for want of attention; the datum unintelligible for one reader; the datum whose interpretation is lost for all.
- **over-throughput** (*sur-débit*): never *overload* or *overflow*.
- **The data artisan** (*l'artisan de la donnée*): the referent whose domain would be the datum itself, a craft yet to be created; the **data craft** (*artisanat de la donnée*) is that craft.
- **forward-looking** renders *prospective* (the forward-looking cases, the forward-looking sheet); *foresight* renders *la prospective* as a discipline.
- **Proper names.** French institutions keep their name, with an English rendering at their first mention (the Access to Care Service, *Service d'Accès aux Soins*, SAS). The PPE keeps its French name, *positionnement par empreinte*, which the text glosses itself (*Fingerprinting Positioning System*).
- **Quotations.** Peter Naur's principle is given in the original English of his 1968 paper ("The data representation must be chosen with due regard to the transformation to be achieved and the data processing tools available."), checked in *Computing: A Human Activity*. The definition of data literacy by D'Ignazio and Bhargava is given in its original English ("through or about data", where the French text says "à travers et au sujet"). The epigraphs taken from *The Canal and the Workshops* are translated from the French.
- **Titles.** *Tried by the Flow* renders *À l'épreuve du flux*; this volume is *Complementary Notes*.

Complementary Notes on the Margins of *Tried by the Flow*

—

AI and the craft, storage, processing, coordination, resilience, attention

Alongside the trilogy *Tried by the Flow* and the book of practical application *The Canal and the Workshops*, some questions deserved a shorter treatment: points that the processual grid makes it possible to shed light on without entering the body of the essays, but that it would have been a pity to leave in the shadow.

Code Displaced, Not Erased examines what AI does to the developer's craft — not a replacement, but a move of the gesture towards language.

The LLM as a Systemic Leap in Storage names what a fusion of three historical roles abolishes of the separation that guaranteed their control.

The Instruction-Driven Function describes the language model called by a program on the data: moving from one representation to another costs less, and the validity of the result is measured instead of being guaranteed by construction.

Designing a Project in the Light of Processual Ontology shows, from a first model case, that the grid equips not only diagnosis but also design.

Locating Oneself in the Noise of the World gives a second one: resilient positioning by signal fingerprint, where a flow of observation turns around into a code of reading when satellites come to be lacking.

Adapting to the Torrent finally questions gamification: not a gadget, but the way the reader adjusts to a throughput that exceeds their window — an acceleration that sacrifices substance, or a mechanism that, used otherwise, serves discernment.