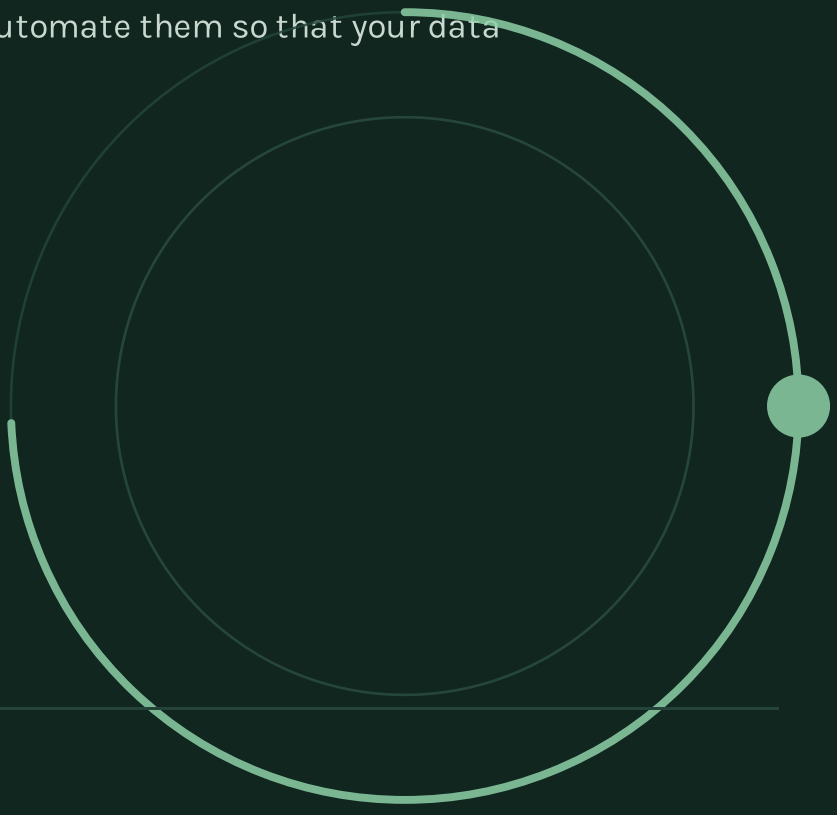
TERMINUS 2π

WHITE PAPER

THE DLM METHOD · DIGITAL LEADERSHIP MASTERY

How to activate the value of your data?

Start from your processes and automate them so that your data works for you.



Adama Ouattara

Terminus 2π edition · V4 · October 2026

Based on the white paper published by Gencovery in September 2025

About this edition

This white paper was first published in September 2025 by Gencovery, where I was then co-founder and CEO. The method it presents, Digital Leadership Mastery (DLM), grew out of many conversations with business leaders, especially in the life sciences and healthcare.

This new edition, published by Terminus 2π, keeps the method, its four stages, its quadrant and its examples. It brings out the method's guiding thread: data is born in processes, and it becomes an asset when those processes are digitized and then automated. Two chapters are new, "Data is born in processes" and "Process automation, the condition of the virtuous cycle"; the quadrant and the stories are reread from the process angle. This edition also corrects a few errors from the previous version.

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INTRODUCTION

About this white paper and the author

This white paper is primarily intended for business leaders, including management teams, but also for anyone seeking to fully harness their data and enhance their expertise. Wondering how to put your data at the service of your ambitions? This book is for you.

Context

For more than two decades, the world of information technology has undergone major upheavals, at a pace that has accelerated exponentially, literally so, particularly since the COVID-19 pandemic and the rise of generative artificial intelligence. The health crisis starkly exposed the inability of our systems to manage fragmented, siloed and poorly interoperable data, both within companies and across healthcare organizations and governments. This lack of interoperability, though critical, remains unresolved today and represents the greatest challenge of this new digital era.

As early as 2018, a scientific study listed more than 20,000 digital tools and databases created between 1990 and 2017 in bioinformatics alone[1]. Since 2020, this proliferation has only intensified. It also affects laboratory instruments, which produce massive volumes of high-throughput data that traditional centralized information systems increasingly struggle to absorb, structure and exploit.

With the emergence of generative AI, fragmentation has deepened further: everyone now develops their own AI agent or assistant, often outside any structured framework, which makes their validation, integration and interoperability far more complex. As a result, it has become extremely difficult for leadership teams to navigate and build a calm, coherent digital strategy within this ever-expanding technological ecosystem. Companies facing these upheavals may, at best, adapt and seize the opportunities of this shift, or, at worst, suffer the ultimately economic consequences of a new digital and societal environment that often feels cryptic to their leaders.

At its core, however, it is relatively simple to decipher and anticipate these transformations. That is why I wrote this white paper: to go straight to the essentials, so you can start iterative and effective digitalization processes that create value from your expertise and your data. I will not dwell on the obvious aspects of digitalization but present my method directly, built on my values, long experience and a pragmatic vision of computing and the role it must play in creating business value while contributing to people's well-being.

This method is the result of many encounters with entrepreneurs, and of lessons drawn from both the successes and failures of companies and organizations. We are not simply talking about digitalization in the conventional sense. Above all, we are talking about putting your data at the service of your business, your ambitions and your vision. Data is the tangible embodiment of your expertise and your collaboration with clients, and therefore your most valuable asset for growth.

> **Digitalization is not an end in itself, but one means among others to put your data at the service of your organization. This white paper focuses on that very approach.**

Objective

This white paper is structured into chapters designed to help you start an effective digital transformation, that is, one capable of sustainably generating value and profitable revenue for your organization.

Positioning

I will often speak of profitable revenue, which may surprise or even unsettle some organizations, particularly in healthcare. In reality, whether you lead a non-profit organization or a for-profit company, generating profitable and measurable revenue is essential. This revenue can be:

- capitalized to strengthen your structure;
- reinvested to support your development;
- distributed to your shareholders;
- or reused in pursuit of non-profit objectives.

Profit should simply be understood as the positive difference between your cash inflows (revenue) and your outflows (expenses). These inflows may come from the sale of services, but also from investors or donors, when an organization shows that it keeps its commitments and achieves the objectives promised. In that case, you are in fact “selling” a promise about the future, and your investors or donors are “buying” it. The notion of profitable revenue therefore applies to all organizations, for-profit or not; you are free to define it according to your activity. This book will help you measure how much your data can become a valuable ally.

In all cases, only a digitalization capable of generating this profitable revenue sustainably can create growth. If you do not share this mindset, this book will be of no use to you. If, on the other hand, you are ready to better leverage your data and build a sustainable model, I am pleased to share with you a summary of my experience. Your feedback and comments are welcome to keep enriching this document.

Who is this white paper for?

Primarily, leaders of innovative companies and service organizations that generate data through their activities, and secondly operational teams. I do not cover digitalization tools or technical aspects here, as they would be of little use to you at this stage: important as they are, these tools are not the true drivers of successful digitalization.

If you are a business leader considering digital transformation, this white paper can support you. Why? Because your posture and vision are decisive for the success of your digital project. It is essential that you can train and raise awareness among your teams about the principles of the DLM method. Most importantly, your people are your most valuable asset, in the daily life of your company as in your digital transformation: make sure they are trained, aligned and engaged.

The author

I have around twenty years of experience in computing and artificial intelligence, spanning research and development as well as industry. I witnessed the first major upheavals brought about by the rise of the Internet and the emergence of bioinformatics, particularly since the sequencing of the human genome

in the early 2000s. I have contributed to major projects for companies and organizations such as CNRS, Dassault Systèmes, Sanofi, bioMérieux and GSK, as well as for university hospitals.

In 2020, I co-founded the startup Gencovery, which I led as CEO, with the mission of making access to data in the life sciences and healthcare more universal, serving the health and well-being of people, animals and plants. I then founded Terminus 2π to put this experience to work on companies' processes: digitizing them, embedding AI agents in them and finally making their data work.

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[1] Clément et al., *A data-supported history of bioinformatics tools*, 2018, arxiv.org/abs/1807.06808.

CHAPTER 1

Active digitalization

> *"It is not matter itself that creates wealth, but the way it is transformed."*
>
> ARISTOTLE[2]

In its usual sense, digitalization refers to the use of digital technologies to improve an organization's processes. However, such improvement does not necessarily mean these measures are profitable. Yes, you have understood correctly: it is essential to measure the profitability, the return on investment, of your digitalization investments.

DEFINITION · ACTIVE DIGITALIZATION

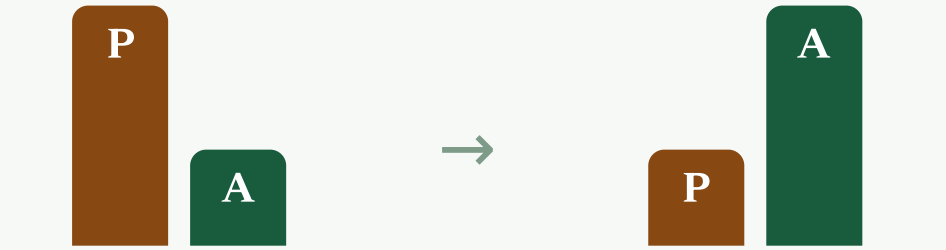
Active digitalization is the art of making your data work for your business. Your data must become a lever for growth, innovation and profitability.

The DLM (Digital Leadership Mastery) method enables you to implement active digitalization. From here on, when we speak of digitalization, we mean active digitalization.

Data is a liability when it is merely generated to deliver a service, then stored, often poorly, and left dormant. In this case it is simply hoarded and costs money: the longer time passes, the less likely it is to be reused or to create value. Data becomes an asset when it is:

- intelligently stored;
- annotated, and structured when necessary, to be accessible and usable;
- continuously reused to deliver new services.

And this must happen autonomously, without requiring extra effort each time: that is the role of processes, provided they are digitized and automated, as the following chapters show.



Make your data work for you. P: passive data · A: active data.

KEY TAKEAWAYS

- Do not generate passive data.
- Transform your data into digital assets that work for your company and your goals.
- Inactive data becomes a burden; active data works for you and creates value autonomously and sustainably.

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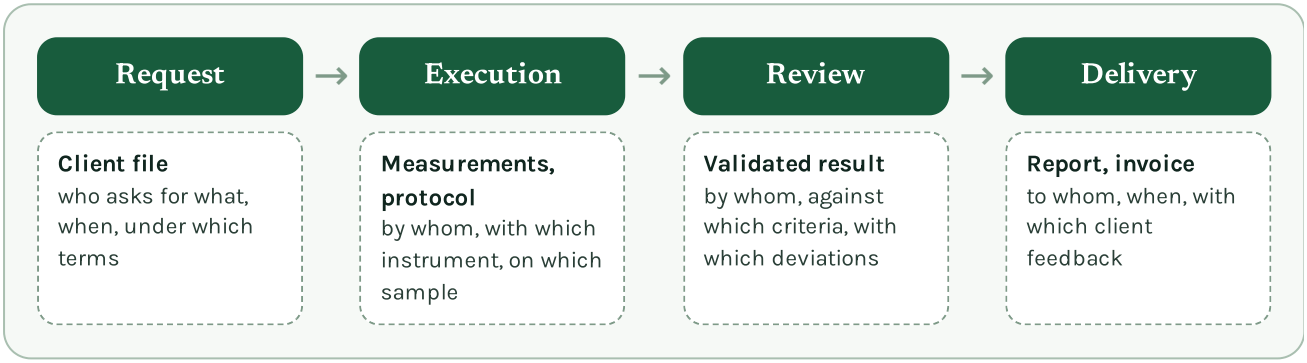
[2] Paraphrase of Aristotle's *Metaphysics* (Book VIII, 1042a): matter has no value without the form that actualizes it. In other words, it is not the raw matter that matters, but the way it is organized and transformed.

CHAPTER 2

Data is born in processes

> *"If you can't describe what you are doing as a process, you don't know what you're doing."*
>
> W. EDWARDS DEMING

Data does not fall from the sky. Every measurement, report, quote and result is produced at a specific step of a process: a client request, an analysis, a quality check, a delivery. It is produced at a given moment, by a person or an instrument, in a given context. A piece of data is the trace of an action.



Each step of a process produces data, at a moment, by a person: this context is what makes it usable.

This context makes all the difference. A value alone in a spreadsheet says little. The same value, linked to the step that produced it, to the person who validated it, and to the client, sample and protocol concerned, becomes usable: it can be found, compared, traced and reused. This is exactly what active digitalization requires: data that is annotated, accessible and continuously reused.

Modeling processes annotates data at the source

When processes are modeled and equipped, annotation happens by itself: each piece of information entered inherits the step, the date, the author and the file it belongs to. There is no need for a project to clean up data after the fact: it is born in context. This is the most economical way to follow the advice given in Chapter 4: annotate before you structure.

Collecting without modeling: a dead end

Many data projects start at the end: gather data scattered across the company into a warehouse or a data lake, then try to clean and structure it. Without the context of the processes that produced it, this work is slow, costly, and has to be redone for every new question. The data has been moved, but it is still passive.

Your tools make each person more efficient. Your losses happen between them: information re-keyed from one piece of software to another, a reminder sent by hand, a file nobody can locate. These breaks don't only cost hours: they produce incomplete, inconsistent and scattered data. As long as processes stay fragmented, so does the data.

> Digital process first: start from processes, digitize them end to end, then automate them. This is the guiding thread of this white paper, and the most direct way to make your data active.

KEY TAKEAWAYS

- Every piece of data is produced by a process step, at a moment, by a person.
- Modeling and equipping processes annotates data at the source.
- Collecting and structuring data without modeling the processes that produce it does not make it active.

CHAPTER 3

The challenges of digitalization

> *"Those who have the privilege to know have the duty to act."*
>
> ALBERT EINSTEIN

Digitalization is no longer an option, but a strategic necessity for all stakeholders: businesses, individuals and public institutions. It profoundly transforms the ways we produce, collaborate, heal, learn and govern. Beyond technological promises, it addresses concrete challenges of innovation, performance, sovereignty and quality of life.

For organizations

- **Innovation**: design new products, services and business models through digital technology.
- **Productivity**: automate, secure and streamline business processes.
- **Competitiveness**: gain agility to face ever stronger and faster competition.
- **Quality**: improve the performance, reproducibility and value of deliverables.
- **Security**: protect digital assets, sensitive data and intellectual property.
- **Responsibility and regulation**: contribute to decarbonization, reduce animal testing (in life sciences) and meet regulatory requirements such as patient rights.

For individuals

- **Simplicity**: easier access to information, knowledge and tools.
- **Well-being**: reduce mental and physical workload through automation, and use personal and real-world data to better support individuals (personalized care).
- **Health**: strengthen prevention, diagnosis and therapeutic monitoring through e-health and medical databases.
- **Compliance**: ensure traceability of actions and adherence to standards (GDPR, HIPAA).

For governments

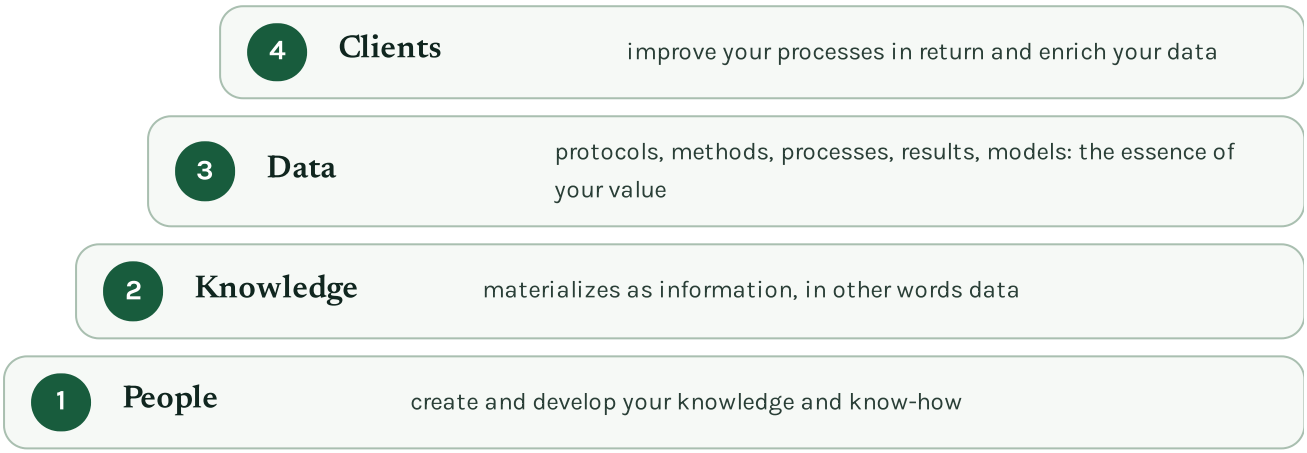
- **Digital sovereignty**: control infrastructures, technologies and strategic data.
- **Economic dynamism**: support innovation ecosystems and industrial sectors.
- **Societal well-being**: improve public services and citizens' quality of life.

CHAPTER 4

The four stages of value creation

> *"The most valuable asset of a company is the individual."*
>
> PETER DRUCKER[3]

To implement active and effective digitalization, it is essential to understand the four key stages of value creation that it helps structure and amplify. What creates the most value in your company?



The four stages of value creation.

Managing, protecting and leveraging this information is therefore essential to transform this capital into added value for your clients. As you will see in the chapter on the virtuous cycle of growth, these stages form a cycle: once your clients generate data in return, you can use it to improve your offerings. To achieve this, it is crucial to establish processes that structure and feed this cycle. The virtuous cycle is the cornerstone of the DLM method, as it enables you to generate recurring revenue from your data.

KEY TAKEAWAYS

- All of a company's information eventually gets stored (files, databases, software).
- This information must be mastered to continuously create value.
- Recurrence in value delivery (regular products and services) is a key factor of growth and resilience.

When your data belongs to your clients

Some of the data you collect originates from your clients or users. In such situations, and depending on regulations, it may legally belong to them. This is the case, for example, with patient data, which belongs to patients, or data generated by CROs (Contract Research Organizations), which may belong to their clients.

This does not mean that such data cannot be leveraged. With the consent of your clients or users, it can be used to improve internal processes, co-develop new technologies with them or generate mutual benefits. The ability to create value from this data therefore depends directly on your business model, and more specifically on how value is shared between you, your clients and your users, while respecting their consent and intellectual property.

Many companies believe this type of value creation is impossible or overly complex, when the real obstacle often lies in their reluctance to adopt a value-sharing model. Wanting to keep everything for oneself is usually a doomed strategy: the growing complexity of data, processes and projects now pushes organizations to collaborate, build smart partnerships and consolidate their strengths to remain innovative and competitive. This is why Chapter 10 is dedicated to the three pillars of active digitalization and to how the business model must align with vision, scientific innovation and technological progress.

The role of leadership teams

A leader should invest in and protect, in order of priority:

1. their people, the source of innovation;
2. their knowledge, their intellectual capital;
3. their data, their digital capital;
4. their clients, who generate revenue.

Who are the clients? Companies (B2B clients), individual consumers (B2C clients), internal business units, investors for companies raising funds, and governments. Business units are a strategic structural lever, still too often overlooked, that any company can use to activate its data in a clear and measurable way. The notion of client is not limited to external stakeholders: a company can also have “internal clients”, especially when a department develops a technology or service intended for other teams. These business units help structure this kind of development by creating clear relationships between producers and users of value, while facilitating governance, traceability of actions and evaluation of results.

Is it necessary to structure data in order to create value from it?

The answer is clearly no. Data structuring is often perceived as an indispensable step; some even consider it the main subject of digitalization. Many companies express the wish to “better structure” their data. While this intention may seem legitimate, it is not always rational.

In reality, structuring is neither a necessary nor a sufficient condition for creating value from your data. Depending on the company’s business model, unstructured data can be just as valuable, or even more relevant, than structured data. Data valorization cannot be separated from the business model.

> **My advice: do not structure your data at all costs. Start by annotating and harmonizing it. This is far less expensive, faster, and delivers a much higher return on investment.**

- **Structuring** means defining a data model to query information more efficiently: classifying and organizing data according to one or more predefined schemas.

- **Annotating** simply means enriching data with metadata or labels. Like tagged items in a warehouse, this makes them easier to identify, trace and use, without locking them into a rigid schema.

Why can structuring become a burden? Because successful structuring requires the business use cases to be defined in advance. Structured data is built to meet specific needs, which naturally leads to rigid systems that are costly to maintain and inflexible if poorly designed. Conversely, annotation and lightweight, agile and scalable tools let companies, especially in R&D, stay adaptable and create value from their data as their needs evolve.

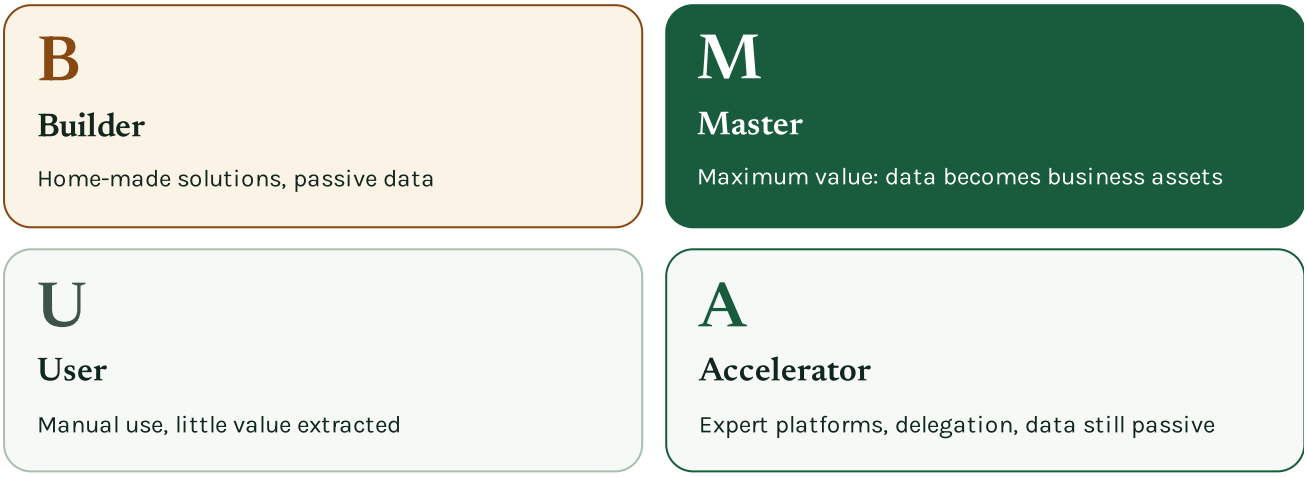
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[3] Regarded as the father of modern management.

CHAPTER 5

The Active Digitalization Quadrant

The Active Digitalization Quadrant is a simple yet remarkably effective tool, designed to help any company assess its level of maturity on the scale of active digitalization. First, it lets you clearly position yourself, so you can visualize the path to turning your data into a true performance lever. Used pragmatically, it will help you identify and prioritize the concrete actions of your digital transformation.



The quadrant of the mastery of data value. Recommended path: U → A → M, avoiding the B trap.

Going further: for companies already advanced in the DLM method, the analysis can be taken a step further. You can position yourself in several quadrants depending on the market segments you serve, for an even more refined and tailored strategy.

How does your company view its data?

The quadrant describes four postures.

QUADRANT	TYPE OF COMPANY	DATA VISION	RESULTS
M · Master	You fully master your data and transform it into business value without additional effort.	Active, an asset. The ideal objective.	Continuous maximum profitability, recurring revenue.
A · Accelerator	You use external expert platforms to accelerate your processes. You delegate, but you don't yet capture the full value of your data.	Optimized passive. Good progress.	Improved productivity compared with U and B, but undermined by fragmented platforms and data.
B · Builder	You systematically try to build your own internal tools, which can lead to inefficiency and risks.	Passive, a liability. Risky: a double penalty.	Operational heaviness, loss of efficiency, since this is not your core business.

QUADRANT	TYPE OF COMPANY	DATA VISION	RESULTS
U · User	You use your data manually, extracting minimal added value.	Passive, a liability. The basic starting point.	Manual service, where data usage is secondary or not optimized.

Quick overview

- Left side of the quadrant (U and B): companies that see data as a burden.
- Right side (A and M): companies that see data as an asset, a value creator.
- Moving to the right marks the transition toward mastery and active digitalization.

The fundamental difference between quadrant M and the others: companies in quadrants U, B and A remain users of digital tools; in quadrant M, companies have established a viable business model around their data.

In some cases, quadrant M may not suit certain business activities. This is not a problem: in practice, a company often spreads across several quadrants depending on its market segments or types of activities. It can even be wise to position some activities in quadrant A to create the best conditions to develop or reinforce quadrant M activities, the most profitable and strategic for the company.

Reading through processes

Each posture also corresponds to a way of running processes.

QUADRANT	YOUR PROCESSES
M · Master	Digitized and automated end to end: each step produces data in context, reused without effort by the next steps, by your teams and by your clients.
A · Accelerator	Automated by expert platforms, but piece by piece: each platform covers part of the journey and keeps its own data.
B · Builder	Equipped with in-house software, but little automated: the effort goes into building and maintaining the tools.
U · User	Manual: paper, spreadsheets, e-mails. Each step depends on a person, and data gets lost between steps.

In other words, moving to the right of the quadrant starts with connecting your processes, then automating them.

> That was our mission at Gencovery; it is now the mission of Terminus 2π: to support you in reaching quadrant M, where your data becomes an autonomous driver of growth.

CHAPTER 6

Why do digitalization projects fail?

> *"The future belongs to those who see the possibilities before they become obvious."*
>
> THEODORE LEVITT[4]

A single cause: the strategic vision does not take the real value of data into account.

- Leadership or management teams not trained in the economic value of data can make poor digital decisions.
- Teams often lack the tools to measure the return on investment of digital projects.

> **The success of digitalization begins with raising awareness among leadership teams, before training operational teams.**

As we will see with the three pillars of active digitalization, strategic vision plays a fundamental role: leadership and management teams must be at the heart of success even before technical teams implement it.

A short but revealing story

In September 2024, three executives first approached me to help them find a partner with whom to build a strategic project. Later, they expressed the wish to better understand artificial intelligence, asking whether I knew any certified training providers.

Instead of recommending an AI course, I suggested we take thirty minutes together to focus on the real challenges of digitalization, particularly in life sciences. Surprisingly, we barely talked about AI, because it usually isn't the real issue. We discussed far more concrete and strategic topics: the role of data in the company, real-world challenges in the lab, and the transformations to anticipate to make the most of their know-how. The exchange was fluid, open and mutually enriching.

That conversation pushed me to formalize the DLM method and later write this book, to structure how I help business leaders. I am grateful to them. Very quickly, I sensed they were ready to hear a different approach. In just thirty minutes, they felt reassured about their path forward.

Looking back, I realized they had naturally repositioned themselves in quadrants A and M, whereas my initial analysis placed them in U. Most importantly, I helped them avoid falling into quadrant B, the trap sold by dream merchants who claim a company can build and maintain custom digital or AI platforms without a clear digital vision.

A few weeks later, they invited me to support them in responding to a call for projects with a strong focus on digitalization. Preparing the proposal went smoothly. On their own initiative, they included digital training for operational staff, essential for progressing toward quadrant M, while keeping their role as

enlightened leaders. They naturally took digital leadership and started their company's digital strategy. My role was mainly to review and provide an outside perspective, emphasizing one key point: pragmatism.

The project was approved and, following this success, they entrusted me once again with supporting their digital transformation.

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[4] Economist and professor at Harvard Business School.

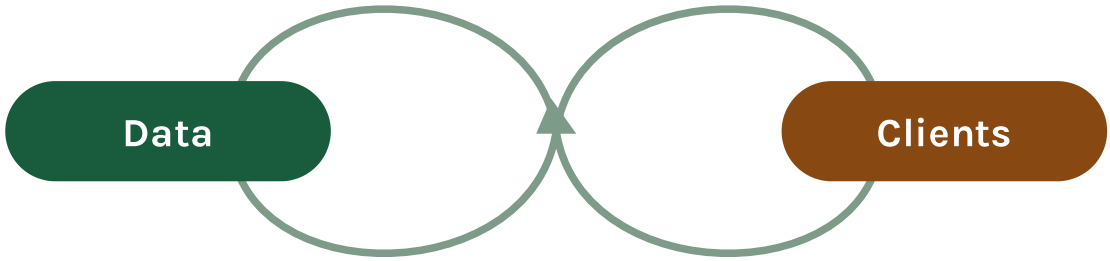
CHAPTER 7

The virtuous cycle of growth

> *"In nature, nothing is lost, nothing is created, everything is transformed."*
>
> ANTOINE LAVOISIER

> **The virtuous cycle is only possible in quadrant M.**

In quadrant M, digitalization is not an expense but a strategic investment that accelerates innovation, unlocks the value of your know-how and your people, and creates a continuous flow of growth and improvement. An M-type company constantly intertwines its business operations with the capabilities of its digital activities to generate new opportunities.



The virtuous cycle of growth: your data serves your clients, who enrich your data in return.

The clients of an M organization generate digital information in return, which should continuously and effortlessly improve the company's services, further enhancing their value. The virtuous cycle completes the four main stages of value creation. To fully activate it, a transformation is required from quadrants U, B or A. It involves a change in perspective: viewing your data as a product or service with inherent value, usable as is, without extra transformation effort. If your data is not directly usable in its current state, it becomes essential to implement the tools and processes needed to make it so.

> **This is how digitalization in quadrant M should be understood: as a proactive and structured approach that prepares you for the unpredictable disruptions brought about by the accelerated evolution of our digital society.**

This movement rests on one condition, developed in the next chapter: process automation.

CHAPTER 8

Process automation, the condition of the virtuous cycle

The virtuous growth cycle is only possible if data valorization happens without additional effort at each stage. If every report, every consolidation, every reminder requires manual work, the cost of valorization grows with activity, and the cycle stops as soon as teams are busy elsewhere. Repetitive processes must therefore be automated.

> Digital process first. AI at the core. Data is born in processes: it is by digitizing and automating them that data finally becomes an asset.

A three-step approach

1. **Digitize.** Map processes, remove unnecessary steps and equip them end to end. Information is entered once, up to date everywhere and traced by design: data stops being a liability.
2. **Embed AI.** Place AI agents at the core of processes: they enter, check, follow up and prepare files and reports, with the teams' approval. Value arrives without extra effort, the very condition of the virtuous cycle.
3. **Measure and grow.** Hours saved, errors avoided, costs cut: every cycle is measured, as the DLM method requires, then reinvested in innovation and growth.

What to automate first

Not everything can be automated, and not everything deserves to be. The best candidates share three features:

- **they are repetitive**: they come back every day or every week, with the same steps;
- **they contain breaks**: they cross several tools or several teams, with re-keying and reminders;
- **they produce reusable data**: what they produce is used by other steps, other teams or your clients.

You can only optimize what you measure. Before automating, measure the time spent per file, the delays between steps, the number of re-keyings and the error rate; afterwards, measure the same indicators. This is how the return on investment of digital projects is managed, one of the weak points identified in Chapter 6.

AI agents under human control

Artificial intelligence changes the scale of what can be automated. AI agents built into processes can read an incoming document, extract and check its information, prepare a file or a report, and follow up with a contact. But an agent is only valuable if it works within a defined process: it knows at which step it acts, on which data, and who validates what it produces.

Three rules keep things under control: important decisions are still validated by a person; every action of an agent is traced, with its inputs and results; agents are configured with the business teams, on their own processes, rather than developed case by case. Used this way, AI does not add yet another isolated tool: it strengthens existing processes.

Data products from automated processes

A recent Deloitte report[5] highlights the importance of automation in modernizing the pharmaceutical manufacturing chain. It defines a “Research Data Product” as a reliable and well-governed data asset, designed for specific scientific needs, structured according to a clear ontology, enriched with contextual metadata and generated through an automated and reproducible process, so that it is easily findable, reusable and shareable across teams.

This report underscores the importance of enriched ontologies, which ensure the precise use of data. As mentioned earlier, an ontology, necessarily tied to a structure, must remain as lightweight and agile as possible so as not to become a burden. In this logic, metadata should be designed as simple labels that tag your data and ensure compliance with the FAIR principles (Findable, Accessible, Interoperable, Reusable).

Data annotation plays a key role here: well-annotated processes can be consolidated, traced and optimized.

The agentic digital twin, the road to quadrant M

By digitizing processes and embedding AI agents in them, we build, step by step, a living replica of the organization: its flows, its data, its business rules. This agentic digital twin lets you see activity in real time, simulate a decision before making it, and hand agents actions they propose and execute under human control. The agents don’t guess: they reason on a mathematical model of the company, built on flow modeling, constrained optimization, scenario simulation and uncertainty quantification. This is how data works for the company without recurring effort: the very definition of quadrant M.

KEY TAKEAWAYS

- Without automation, the cost of valorizing data grows with activity, and the virtuous cycle stops.
- Automate first the processes that are repetitive, contain breaks and produce reusable data; measure before and after.
- AI agents work within defined processes, under human validation and with full traceability.

[5] Deloitte, *Pharma’s R&D lab of the future: Building a long-lasting innovation engine*.

CHAPTER 9

The benefits of active digitalization

Committing to a true digital transformation driven by the active value of data offers many concrete benefits for leadership teams and the entire company.

For leadership teams

A better digital and economic posture

- A strategic vision of data as assets generating sustainable growth.
- The ability to turn data into differentiating competitive advantages.

Better performance management

- More precise, real-time monitoring of KPIs and return on investment.
- Easier decision-making through clearer visibility of strategic data.

For the whole company

Continuous improvement of data quality

- Data is no longer neglected or needlessly hoarded: it is annotated and leveraged.
- Better traceability and reliability of the information used every day.

Optimized processes and services

- High-quality data enables better coordination, more automation and optimized operational performance.

Stable, recurring revenue

- By valuing data as a product or service in its own right, the company can create new business models, strengthen its offerings and generate sustainable revenue streams.

Global impact

- Improved profitability: cost reduction, better use of resources, increased revenue.
- Improved service quality: higher customer satisfaction and loyalty, stronger reputation.
- Easier quality procedures, certifications and due diligence.
- Increased overall enterprise value.

A note for innovative service companies

Some innovative service companies can shift from a “pure service” model to a hybrid model with recurring revenue by better leveraging their data. Data and software then become new assets that generate recurring income through the valorization of digital know-how.

In life sciences, long focused on in vivo experimentation, alternative approaches are emerging. Grouped under the name NAMs (Non-Animal Methodologies), they are increasingly encouraged by regulators to reduce reliance on animal testing. Among them, digital methods stand out, through the use of artificial intelligence models to optimize decision-making and better use of data to reduce reliance on traditional experiments. Companies that successfully bring these alternative methods into their service offerings will naturally gain competitiveness over their peers.

These transformations are even more relevant for companies with specific, differentiating expertise, which is the case for most innovative service, R&D and production companies. Lacking suitable methods and tools, many underestimate their ability to evolve toward quadrant M. This white paper aims to support them in that transition.

CHAPTER 10

The three pillars of active digitalization

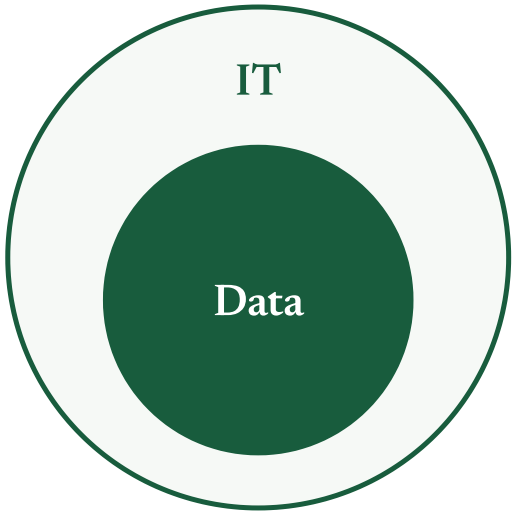
> *"If you want to go fast, walk alone. If you want to go far, walk together."*
>
> AFRICAN PROVERB

In a company, the success of an active digital transformation does not rely solely on the IT department. Too many organizations build their digital strategy exclusively around IT, viewed as a simple support function for R&D, quality, finance and production. At best, they create a technology hub led by a CTO to structure this approach. It is essential to distinguish two often-confused notions:

- **Digitization**: moving from paper to digital, with the primary goal of improving processes.
- **Digitalization**: implementing mechanisms not only to improve processes through digital tools, but also to unlock the value of the company's digital assets.

Too often, IT teams are seen merely as support services for business units: managing servers, installing software, ensuring maintenance. This simplistic posture, reinforced by innovation and finance departments, reflects an under-exploitation of IT's strategic potential. With the rise of AI, some companies have created data departments, often led by a Chief Data Officer, but these are generally disconnected from business units, and sometimes even from IT itself.

Remaining conservative to avoid disrupting existing processes is no longer viable. Disconnecting IT from the business vision is a fundamental mistake for any organization seeking to activate the value of its data. IT, including data, must sit at the heart of innovation and value creation, aligned with the company's vision: it must be a true catalyst for performance and innovation.



Data is an integral part of IT.

The IT department must manage all information technologies, including data. It is not merely a support function: the data function must be part of IT, and IT must be embedded in the innovation and revenue-generation strategy. Some will argue that managing IT infrastructure and managing data are two differ-

ent things. That's true! But nothing says IT should be limited to infrastructure. This reductive view comes from a traditional, outdated conception that has not evolved for lack of understanding of the real stakes of digitalization.

The story of Amazon Web Services (AWS), now the world leader in cloud computing, illustrates this perfectly. AWS was born from an internal need at Amazon: an IT infrastructure capable of supporting its ambitions and the processing of massive amounts of information as its activities grew rapidly. Initially designed to meet Amazon's own challenges, the solution was later opened to companies worldwide facing the same issues. By turning this infrastructure into an asset it could monetize with new clients, Amazon activated a new virtuous cycle of growth. Today, deploying data effectively can no longer be separated from innovative and adapted infrastructure resources.

In my view, the three pillars of successful digitalization are simply:



The three pillars of active digitalization.

This trio is fundamental for building an active digital strategy: it aligns strategic vision, innovation and sustainable revenue generation.

A short and informative story

I recently spoke with an R&D manager at a hospital who explained that the hospital lacked an effective communication infrastructure between its still-siloed departments to exchange data efficiently. This was a major barrier to adopting digital tools that would allow effective collaboration between these units.

It quickly becomes clear that if the team managing the network does not deeply understand physicians' collaboration needs, essential for accelerating research and therapeutic care, it will naturally prioritize maximum security. This can result in strict compartmentalization: technically flawless, but entirely counterproductive given today's digital challenges. To avoid this, IT must be fully integrated with the business functions, to co-build, or even proactively design, the right solutions aligned with both strategic and operational needs.

SHORT STORIES

Three organizations, three postures

This section briefly presents a few company cases inspired by real situations, to help you assess your own position in the DLM method.

Story 1 · Company 1

Company 1 delivers expert services based on its know-how and innovations. Its clients hire it to work on biological samples they want to understand, and it provides them with analysis reports. In short, Company 1:

- uses its expert know-how;
- uses a set of technologies it masters well, such as laboratory instruments;
- generates a large amount of data, protocols and results, stored both in the cloud and locally on disks;
- built an in-house, custom software tool to analyze this data and deliver results as PDFs;
- wants to move up a level by delivering results interactively to its clients through an easier-to-access collaborative platform;
- regularly improves its processes to enhance result quality;
- aims to offer new types of services to enrich its portfolio.

Gencovery supported Company 1's digitalization; the company was convinced by its vision, expertise and approach: helping it take control of its data so that the data works for it. Its leadership was already actively looking for solutions, with a vision compatible with ours, which made the support straightforward. Company 1 has automated part of its analysis workflows. The modularity of the approach lets it progress step by step, each stage delivering measurable value. It can evaluate the solutions with its clients and build a new recurring-revenue model based on these new assets.

THE PROCESS SIDE

A sample's journey, from reception to report, crosses instruments, in-house software and files. Automating part of the analysis workflows was the first step. The next one is to connect reception, analysis and the interactive delivery of results into a single traced process, so that every report enriches reusable data.

EXERCISE

Which quadrant does Company 1 belong to, and why? Is its data active? Take five minutes to reflect, then imagine how Company 1 could better leverage its data.

Story 2 · Company 2

Company 2 has been developing in-house tools for its own needs for years. It is highly skilled at building them, with several departments dedicated to its digital activities. It seems to manage its data fairly well, but it struggles to turn its digital assets into value and even to coordinate complex digital R&D projects. In brief, Company 2:

- has built strong expertise in developing and using digital tools;
- actively develops innovative R&D methods and uses this know-how to help other companies (pharma, biotech);
- provides services based on its expertise;
- manages its own data storage and analysis;
- has started using external software for certain activities, after repeatedly trying to build it in-house.

Company 2's leaders are convinced their digitalization must be done exclusively in-house. They seek advice only from internal experts who, unsurprisingly, are emotionally invested in these strategic decisions. I have seen this pattern in many companies. The result: Company 2's decisions are not objective. You must be able to stop a project that isn't working, without emotion, especially when the company's future may suffer. Some leaders hesitate for fear of going against their teams.

My advice: leaders should build their awareness of the stakes of digitalization so they can challenge their teams and make better decisions. The quadrant where Company 2 sits is also called the "Skeptics' Quadrant". It can be particularly hard to leave, especially when a company has built a, often fragile, digital empire and refuses to let go in order to progress. By fragile, I don't mean lacking skill or technical quality, quite the opposite: these tools are usually solid and built by talented internal experts. The real issue lies elsewhere: a digital product is never static. It must be maintained, updated and adapted, which becomes extremely complex in a constantly evolving digital ecosystem. What works today may be obsolete tomorrow without a durability strategy from the outset.

Company 2 cannot clearly answer two questions: what is its true core business? How can it make its data truly work for that business, without recurring effort on its part? The success of the DLM method closely depends on leadership maturity: it is very difficult to work with leaders who are not ready to recognize the real value of their people, and thus of the data they produce, or to understand how to extract and maximize that potential.

> THE PROCESS SIDE
>
> Its processes are equipped, but with in-house tools that must be maintained: the digital effort goes into building, not into automation. Mapping its processes end to end, separating what belongs to its core business, would help it decide what to keep, what to entrust to platforms and what to automate first.

EXERCISE

Which quadrant does Company 2 belong to, and why? Is its data active? Imagine how Company 2 could better leverage its data.

Story 3 · Organization 3

I recently met the founder of a non-governmental organization for which I have deep respect, given the remarkable work she has been doing for many years to serve local populations on a non-profit basis. Organization 3 holds a valuable dataset, rigorously collected over more than ten years on several tens of thousands of patients. It has already partnered with data analytics companies to better leverage this information: cleaning, structuring and extracting useful insights to improve support for the population. In short, Organization 3:

- holds a genuine goldmine of largely underexploited data;
- has started to leverage part of it by outsourcing certain analyses to specialized companies;
- recognizes the immense untapped potential of this data and is open to support to better structure and analyze it;
- is uncompromising on ethics: the data belongs to patients, and any use must strictly respect privacy, informed consent and applicable regulations.

The organization feared a commercial exploitation of the data by another company. I presented an alternative vision: an ethical use, respectful of patient consent, serving the common good. Technologies now exist that guarantee the traceability and transparency of data use and enable trusted valorization. Fear and lack of trust often lead to poor decisions, particularly when they prevent high-impact innovation projects from emerging. Several e-health startups thus struggle to access local or national data to develop and test their technologies and, lacking better options, resort to open-source or foreign databases.

After discovering a vision based on open, decentralized and sovereign technologies, the founder realized that other models exist to ethically valorize the data she holds while keeping control over it, serving the populations concerned and generating revenue to better support them locally. Organization 3 committed to an active, responsible and human-centered digitalization. Even non-profit organizations can activate the value of their data.

THE PROCESS SIDE

Its data was collected over ten years in its patient follow-up processes, but it is used after the fact, through one-off analyses entrusted to third parties. Digitizing the follow-up process itself, with consent collected and traced at each step, would give it data in context from the moment of collection, which it could use without starting from scratch for each analysis.

EXERCISE

Which quadrant is Organization 3 in, and why? Is its data active? Imagine how Organization 3 could better use its data.

Under data protection and privacy regulations (including the GDPR), health data belongs to patients. This does not preclude its use for research or profit, provided such use respects patient consent and complies with the legal framework.

FOCUS

Remarks on Quadrant B

Quadrant B is that of the Builders, or “do-it-yourselfers”, and I must admit I have a certain affection for it, because I personally enjoy tinkering. However, building digital solutions in-house is not always the best approach, especially for companies whose core business is not software development.

A Deloitte survey[6] published in 2018 indicated that only about 20% of biopharma companies reach digital maturity. What the study didn’t emphasize is that this maturity is extremely difficult to maintain over time.

Take Google: despite being recognized as one of the most innovative software companies in the world, it was shaken in just a few months by the rise of OpenAI. It struggled to respond and reposition itself in generative AI with the launch of Gemini, partly because of its strong, historically entrenched strategic focus on quantum computing. To stay in the game, Google had to pivot quickly toward generative AI.

This story highlights a key reality: maintaining digital maturity is economically demanding, even for digital-native companies. That is why I strongly discourage life sciences companies from developing their own software internally, unless there is a very strong strategic reason, in the hope of preserving sovereignty over their digital assets. The real risk is less technical than strategic: without ongoing monitoring, constant updates and a long-term vision, what looks like an asset today can quickly become a burden tomorrow.

This is also why the Builder struggles to automate: the effort goes into building and maintaining its tools instead of making its data work. Quadrant B is unique: it can represent a significant risk for a company. Yet, paradoxically, it is also the quadrant where organizations often have the best resources to progress, on their own, toward quadrant M. To do so, they must decide to make their data work for them, and not the other way around.

Avoiding the Builder trap

Building all your own tools absorbs the effort that should go into automation. Relying on an expert platform and team means following the recommended path: accelerate first (quadrant A), then turn your data into a real asset (quadrant M).

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[6] Deloitte, *Digital transformation in life sciences: How pharma and medtech can shift from doing digital to being digital*, 2018.

GO FURTHER

Taking action

The real value of your digital transformation does not lie only in acquiring new tools, but in your ability to activate your data in service of growth, by combining long-term vision, innovation and revenue generation. The Active Digitalization Quadrant is a strategic, tactical and operational tool that helps you assess your digital maturity, identify your levers for progress and implement a value-driven, profitable digitalization.

With Terminus 2π

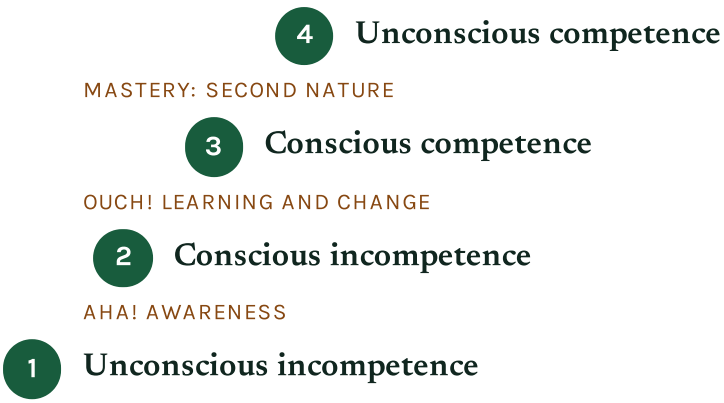
Terminus 2π makes process automation its starting point. We bring both the platform, with the Liquid technology, and the team that deploys it on your processes, from the first workshop until your teams are autonomous. Depending on your quadrant, the priority differs:

YOUR QUADRANT	YOUR PRIORITY	WHAT WE DO WITH YOU
U · User	Move away from manual work without falling into the B trap.	Process diagnostic, digitization of key processes, first automations.
B · Builder	Refocus effort on the core business and automate.	An objective outside view, an overall map, connecting existing tools rather than adding more.
A · Accelerator	Capture the value of data scattered across platforms.	Data annotation and harmonization, AI agents built into processes, data-driven management.
M · Master	Maintain maturity and extend the virtuous cycle.	Agentic digital twin, scenario simulation, new data-based services.

To bring these principles to life in your organization, we offer:

- a full exploration of the Active Digitalization Quadrant applied to your situation;
- hands-on workshops to design a strategy tailored to you;
- a personalized assessment of the expected impact and benefits for your business;
- a deliverable with the keys to activate your data and drive digital growth.

The entry point is the Express Process Diagnostic: in ten days, we map your key processes, measure where you lose time, quality and money, and hand you a costed action plan.



The four stages of competence: key milestones on the journey to make data mastery second nature for your organization.

IN CLOSING

Acknowledgments

Digitalization is not an end in itself. It is the key to making your data work for you, transforming your business model and accelerating your growth. With the right digital posture from leadership teams and the intelligent activation of data, your organization can benefit from better management tools (KPIs, return on investment), better valorization of its data and know-how, and a more resilient business model.

Thank you for taking the time to read this white paper. I am grateful to the leaders with whom I exchanged over several months and without whom this work would not have come to life, and to everyone who took the time to share feedback. If you would like to share your experiences, ideas or suggestions, I would be delighted to connect. And if you found this content useful, please feel free to share it: it may help others progress in their own thinking.

Contact the author or a DLM expert

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