8. Digital Transformation

In the energy business, the volume of slides, expert papers and conferences devoted to digital transformation between let's say 2015 and 2025 is second only to those dedicated to green hydrogen, and the resemblance between the two is not accidental. Both promise salvation through abstraction, both rely heavily on diagrams rather than decisions, and both allow organizations to appear forward-looking while leaving their operating models largely untouched.

The idea behind digital transformation is not new. The concept of the Internet of Things, the IoT, was coined by Kevin Ashton in 1999, based on a simple observation: computers and machines are fundamentally limited unless we allow them to communicate through data. For many years, however, this remained a theoretical aspiration. Data was scarce, expensive to store, difficult to transmit, and fragmented across systems. Everything was "on prem", and even modest volumes of operational data were costly to retain. Meaningful conversations between machines and decision-makers were technically possible, but economically impractical.

This changed first gradually, and then suddenly: smartphones, cloud computing, cheaper sensors, and exponentially growing storage capacity transformed data from a constraint into an abundance. At roughly the same time, a small number of companies, Amazon, Netflix, Google, demonstrated that strategy could be tested continuously rather than declared once, and that feedback loops could be engineered at scale. Their success ignited imagination far beyond their industries.

Consulting firms followed shortly after: when the McKinsey Global Institute published "Big Data: The Next Frontier for Innovation, Competition, and Productivity" in 2011, big data entered boardrooms decisively, inaugurating a decade of frameworks, maturity models, roadmaps, and conference circuits. By 2021, enough white papers existed that the same organization could: assemble credible-looking digital strategies from recycled material, satisfying the curiosity of boards and placidly pretend that Teams was a substitute of Zoom and Skype and sending files internally as attachments to emails was a safer practice than sharing in SharePoint, ignore any basic of the 3Cs (communication, collaboration, cooperation).

Digital transformation was a performative act: every energy company could produce a slide deck showing how data would be harnessed to deliver near-magical operational improvements. Arrows connected sensors to clouds, clouds to analytics, analytics to insight, and insight to value. What these diagrams consistently failed to show was how authority, incentives, and decision rights would change as a result. Digitizing processes was blended with transforming organizations by creating new roles that soon from managerial level start clamoring for a seat at the board table.

A telling example is the frequent presentation of large-scale record digitization as digital transformation. Scanning millions of documents, building a data center, and storing information more efficiently may be administratively useful, but it does not alter how decisions are taken, how trade-offs are resolved, or how consequences are absorbed. There is nothing transformational about converting paper into pixels if the organization consuming those pixels behaves exactly as before.

The real limiting factor in digital transformation shifted quietly from technology to management. Once data became cheap, abundant, and accessible, the constraint moved upstream; the challenge was no longer how to collect information, but how to act on it without destabilizing existing hierarchies, careers, and narratives. Faced with this challenge, many organizations chose the safer path: adopt the tools, keep the structure.

This is where digital transformation becomes structurally aligned with everything discussed in the previous chapters. Like learning initiatives, it produces activity without consequence. Like human error narratives, it redirects attention away from system design. Like bad models, it offers explanation in place of judgment.

Much of the confusion stems from the uncritical adoption of language imported from digital-native companies. "Fail fast, to learn faster" sounds appealing in environments where failures are reversible, cheap, and informative. In operations, this logic collapses. Energy companies cannot fail fast. They cannot test availability, safety, or system integrity in production environments without unacceptable risk. Treating this constraint as conservatism misses the point entirely; it is a fundamental property of asset-intensive systems. These assets have been

financed by lenders and investors who put their trust in long term contracted cashflow, not the adrenaline of a startup.

The unresolved question, therefore, is not whether organizations should experiment, but what they can legitimately test and where. Many digital initiatives stumble precisely because this distinction is never made explicit. Projects are launched based on technological plausibility rather than operational admissibility. When they fail, learning is claimed, slides are updated, and the organization quietly retreats, having confirmed once again that transformation is risky while digitization is safe.

This enthusiasm for digital transformation has created a secondary market of digital initiatives that are impressive, harmless, and irrelevant but consistently expensive. Dashboards proliferate since KPIs can be updated in real time. Analytics detect patterns that no one is authorized to act upon. Decision latency is reduced in theory and preserved in practice, when not increased. The organization appears more informed than ever, while remaining just as hesitant in front of a plethora of data.

The deeper issue is that digital transformation is often used to scale exactly what should have been questioned. Ambiguous accountability becomes automated reporting reaching everyone. Weak models become embedded in code. Deferred decisions become recurring alerts. What was once a managerial choice becomes a system feature, harder to challenge precisely because it now appears objective.

Digital tools are not neutral: once deployed, they shape attention, define what is discussable, and privilege certain questions over others. When they are introduced into organizations that have not resolved who decides, on what basis, and with what exposure to consequence, they do not create clarity and encourage avoidance.

This is why digital transformation is so often disappointing. Not because the technology fails, but because it succeeds in the wrong environment: providing speed, visibility and sophistication without the necessary direction, authority and responsibility.

Power plants do not become safer, more reliable, or more resilient because they are digitized. They improve when decisions are taken earlier, closer to the asset, and with fewer places to hide. Digital tools can support that outcome, they cannot substitute for it.

Until organizations understand that digital transformation amplifies their existing operating model rather than replacing it, they will continue to invest heavily in systems that explain more, decide less, and reassure everyone except the asset itself. On a brighter note: I have seen examples of introduction of remote performance and monitoring centers that really provide added value to the assets and the operations, but note that it always happened in companies that abandoned any ambiguity and identified clear purpose for the digital transformation.