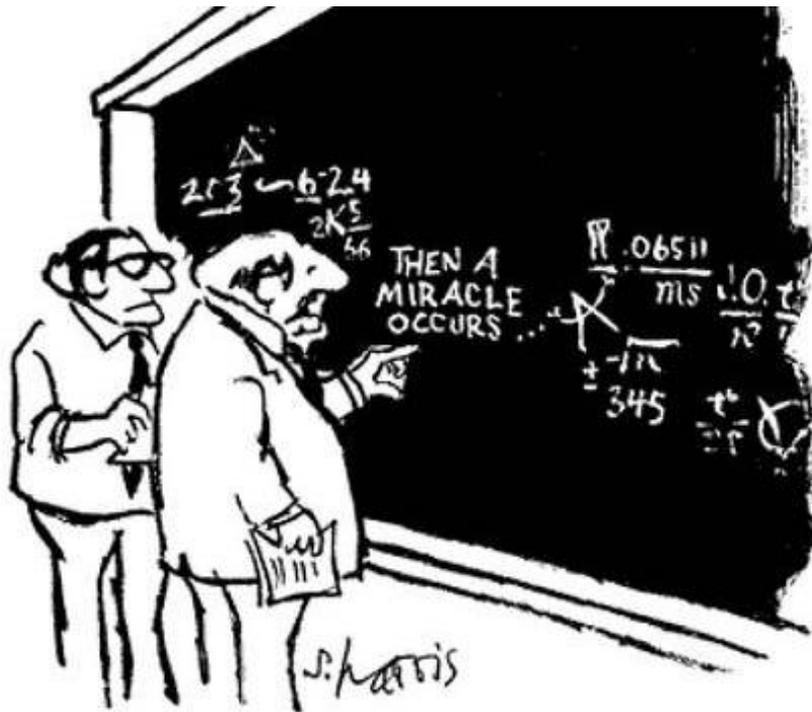


What Is Digital Transformation?



"I think you should be more explicit here in step two."

by Mac Clark

and the staff at



management strategies

www.ms-strategies.com

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1 What is Digital Transformation?

At a basic level, Digital Transformation is no different than any other form of business transformation. Beyond the basics, however, the differences can be profound. To better understand them, let us look more closely at some of the basics.

From the earliest use of metals in industry and war from at least 5000 BC, through the introduction of advanced digital mechanisms today, human societies have relentlessly exploited new technologies. Each advance has enabled – if not forced – transformations whether of armies or farmers, bankers or blacksmiths, owners or assembly line workers. Transformation is nothing new. Past experiences in this area inform the future.

For the foreseeable future, the magnitude and complexities of technology-driven transformation outstrip all historical challenges. One of the main aims of this document is to try to explain why, and to suggest how we can leverage past experience in planning and executing Digital Transformations today.

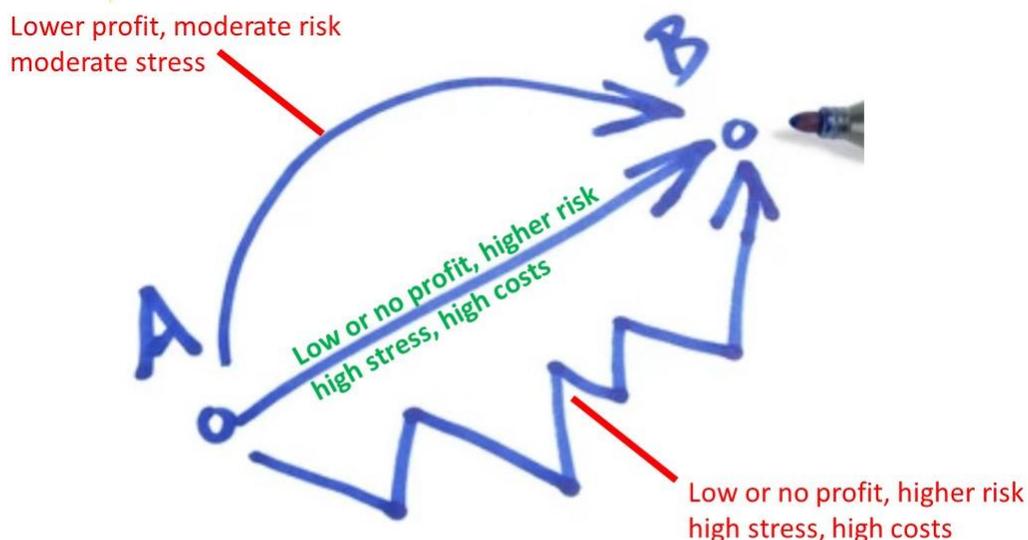
It all starts with CHANGE. Every transformation has the purpose of moving an organization from a current position of capability and performance to a new position of greater capability and performance.

In the following, we will explore some of the recurrent themes in Digital Transformations of all sorts. These themes are not speculative. Each one is tried and true. They have been forged in the crucible of competition and tempered in the stress of economic dislocation. One example of reoccurring Digital Transformation themes is "Reduce Costs". (The logic of course is transparent: every dollar trimmed away from costs flows immediately to operating profit.)

To make such Digital Transformations work well, we need to grasp and understand their essence. Let us think of the organization's starting business condition as the proverbial **Point A**, and its ending condition as the proverbial **Point B**. Transformations solve the challenge of moving the organization from **POINT A** to **POINT B**.

The net change between these two states of affairs we call the delta (or shorthand Δ). Δ is the difference between where we start from and where we wind up.

This is easy to say, but it is not at all a simple journey. Depending on the sequence of steps to move the organization from **POINT A** to **POINT B**, the effort can yield higher or lower **profits**, higher or lower **risks**, higher or lower of **stress** (wear and tear) on human participants or the business itself.



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The bigger the Δ the more difficult it is to achieve the desired change, and the more necessary it is to have a prudent and effective change management process.

There is nothing simple about it. It involves selecting the best way to move along a large set of strategic directions as well as a

wide range of tactical dimensions and directions – some of which may be neither visible nor controllable.

Injecting digital technology into this mix complicates the change process and can lead to a multi-fold increase in the risk of delay, cost overruns, or even outright failure.

Tradeoffs abound:

Any change, any movement, takes place through some variation in processes, or in the people and the decisions they make, or through some differential element of the technology that the organization applies to its business activities. In order of complexity and difficulty, these include the following:

Changes in process, while potentially complex, can be constrained and thus forced to be straightforward.

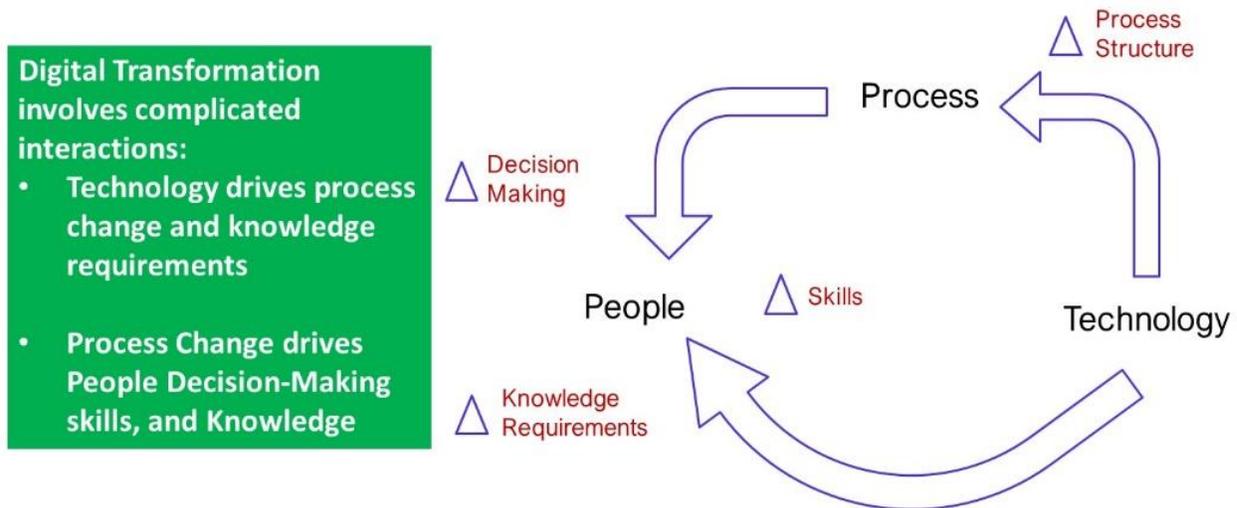
Changes in people's way of discharging their responsibilities are somewhat more complex than process changes but are bounded by human behavior, by limitations on cognitive capability, and by the scope of each individual's decision-making authority. Human behavior is tricky though and can prove extraordinarily difficult to forecast with precision.

Changes in technology are the most unpredictable and difficult of all. They can be radical and complex. The long-term consequences are almost unforeseeable at the outset: Consider atomic weapons or climate change as premier examples.

Technology consequences at the level of individual organizations and governance and operations are no less consequential, being "smaller" only in terms of scale.

1.1 People, Processes, and Technology

Digital Transformation is about mechanisms of change: changes within a framework of **People, Processes, and Technology** - a framework that most managers find useful.



In this picture, **People** matter most.

Changes in processes force people to acquire new skills and utterly transform, reduce, or expand their decision-making scope in a near magical manner and extent.

Changes in technology are especially impactful. Where technology change is great people must acquire deep knowledge of technology-based features. "Front-line" operating personnel who are interacting with new software or new equipment typically require extensive training. These new features generate process changes, including their relevant procedures, policies, and operational planning.

Of course, these changes spill out into the environment beyond the enterprise. They affect customers, vendors, and regulators, even employees' home life. When they do, they make both implementation as well as evaluation of their effectiveness more difficult and at the same time more essential.

Any change – no matter how large or small – is a transformation. What differs is the degree of complexity and

the demand on management time and energy to steer the transformation to completion. If we merely move an inspection process step to an earlier point in a sequence of steps, then that transformation has a minor organizational impact. But, if doing so allows catching errors earlier, it can yield a substantial increase in efficiency and net financial gain.

As more moving parts of the operation are modified, the aggregate transformation grows in complexity. Eventually, control mechanisms are needed (i.e., change management) to keep the evolving transformation on track.

1.2 The Simpler Digital Transformation Objectives

Some of the more frequently occurring objectives are below.

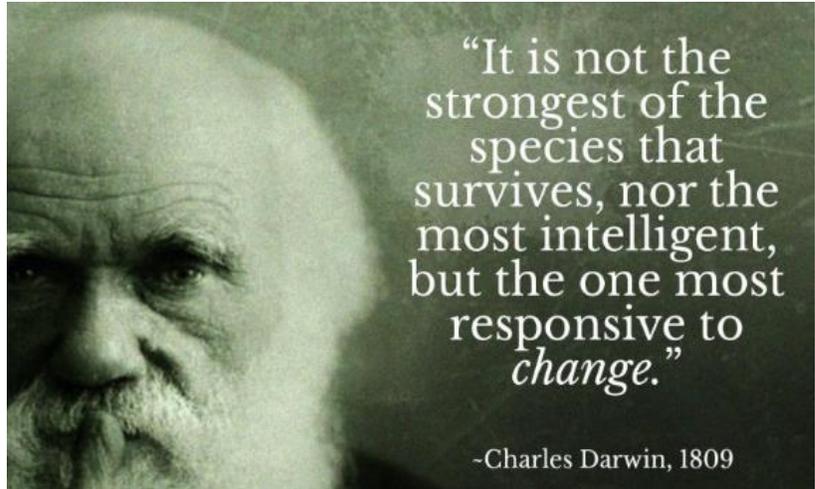
- Reduce costs
- Reduce time-to-market
- Reduce cycle times
- Reduce error
- Reduce touchpoints
- Remove human interactions
- Simplify human interactions
- Gain data that will be useful downstream (possibly much later downstream)
- Increase Revenue

1.3 The Usual Software Processes

Although Digital Transformation spans a broad spectrum of concepts, the actual processes for creating software to support it are not different at all from more common, existing approaches. The same challenges, risks, and complexities exist. There is no magic.

2 The Darwin Enterprise

A business enterprise is a connected, networked Darwinian organism of great production capability, and usually great complexity. Like all Darwinian organisms, an



enterprise is in a constant struggle to acquire resources necessary for survival and growth and to defend itself against attack by competitors. It utilizes **PROCESSES**, **PEOPLE**, and **TECHNOLOGY** to do so.

PROCESSES

are the dynamical mechanisms by which the Darwinian enterprises carry out economic activity (as well as political, educational, and philanthropic activity).

PROCESSES include assets, .e.g., machines, buildings, patents, and other resources and activities that support the business.

PROCESSES then encompass the "planning and determination" of configuring and deploying those assets and operating them most effectively.

PEOPLE

drive and sustain processes. They apply deep reasoning to implement processes and the individual process steps that comprise them.

PEOPLE are also effective when automated agents (machines and computer programs) cost too much to

perform simplistic tasks where deep reasoning is not required, or specific know-how is not needed.

TECHNOLOGY

incorporates "know-how" as well as electronic logic (algorithms) that can change/improve the way PROCESSES work and the way PEOPLE interact with those PROCESSES.

The categorizations of PEOPLE, PROCESSES, and TECHNOLOGY are not rigid characterizations. For example, although some managers may view electronic devices as assets that are part of PROCESSES, others may view electronic devices as TECHNOLOGY that are distinct from PROCESS assets.

The boundaries between the groupings are not as important as the interactions among the various constituents of the groups. The interactions are what enable the Darwinian enterprise to react to its environment and they determine how it captures profit and builds return on equity.

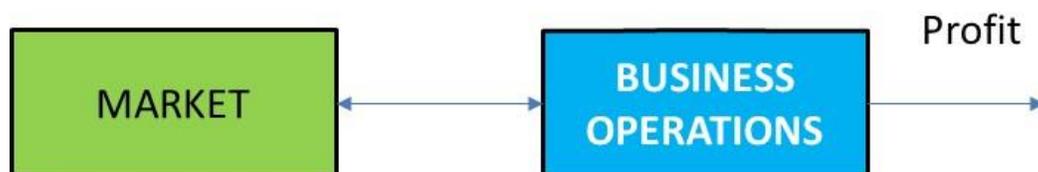
2.1 Key Business Scenarios and the Operations Engine

In this section, we discuss several illustrative Business Scenarios against which we can explore various Digital Transformation themes. The core focus of our attention is the operational mechanisms that allow the business to achieve its objectives.

The OPERATIONS ENGINE is a primary enabler of business strategy. It is a good place to start pursuing Digital Transformation objectives. For example, if you have the operational capability to deliver high-quality customer service faster, better, cheaper than your competitors, then you can compete strategically on service. Those virtues can be exalted through aggressive marketing. You can win and retain customers by outperforming competitors on key measures of responsiveness.

2.2 Market and Operations

Many business challenges can be met and optimized by focusing on just the MARKET and BUSINESS OPERATIONS. Managers can tune strategy and tactics to maximize profit across these two domains. We indicate this by the schematic below:



This is the simplest scenario. Nothing could be more straightforward. If you satisfy the market, you win. But if you fail to satisfy the market you lose. Competitor can't attack you because you have a lock on your niche (e.g. a baker goods chain offering Swiss delicacies local competitors can't possibly match).

2.3 Competitors, Market, and Operations

The optimization figure above is generally enough to ensure sustained high profits if the business's products and services are superior in the marketplace, and competitors are weak or have operations engines that perform poorly.

But competitors can be clever. Some are willing to buy market share through pricing moves that can motivate an appreciable number of customers to switch to their products and services. In that case, the following scheme gives a better idea of what we need to optimize.

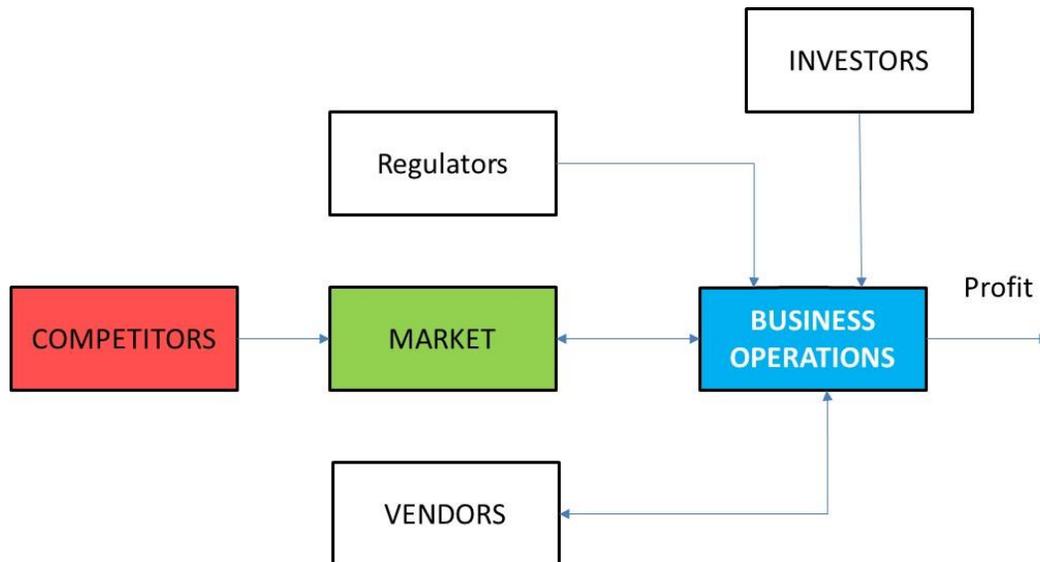


Expert competitors can greatly complicate the management challenge. The operations engine must not only provide a basic level of high performance but also needs to turn in better results than any competitor. Competition drives a constant cycle of improvements to increase profits and counter moves that constantly change market price points and customer demands for features and vendor responsiveness.

2.4 Adding Vendors, Investors, and Regulators

But the story does not stop there. Depending on the industry there may be critical integrations necessary with vendors. There may also be demanding regulatory constraints. And most importantly for companies with growth ambitions, investors may bring their rule books that impose stringent performance requirements – they are looking for home runs and standout execution that go well beyond merely being adequate.

All these factors lead to the optimization problem in the figure below.



The Digital Platform

Meeting these kinds of business challenges requires that the OPERATIONS ENGINE needs to be supported by a DIGITAL PLATFORM that interacts with the REAL WORLD. The Digital Platform incorporates a LIVE MODEL of the business. The Digital Platform is connected to the real world through people, machines, and links to other Digital Platforms.

The Digital Platform is not a passive mechanism. It can sense and react to real-world events. It can issue instructions, take direct actions, and cause indirect action.

3 The Digital Platform

A Digital Platform is necessary to solve business optimization problems like the ones in the previous section. Without such a platform the problems are too complicated, messy, and slippery to manage using manual methods.

The Digital Platform is defined by the total collection of logic, data, and interfaces (of all sorts) established by Digital Components. It represents, supports, and contains the important elements of the business.

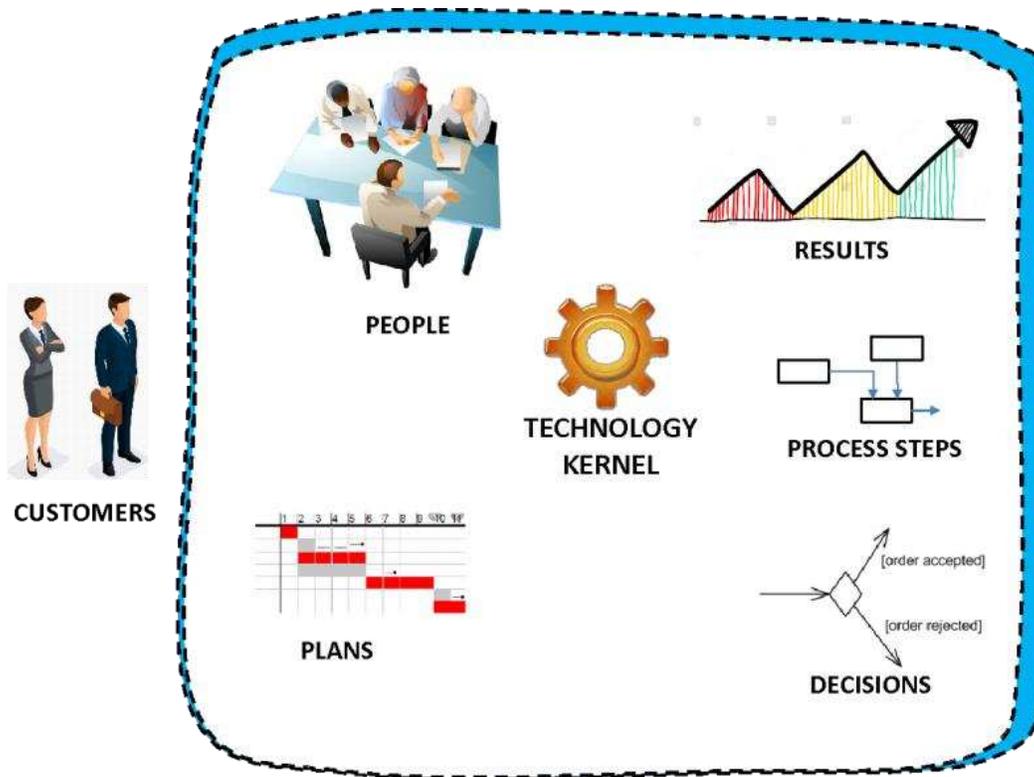
It encompasses both regular operating functions as well as less repetitive, or single-use business capabilities. Digital Platforms can be complex. Often, they consist of a disjointed mix of software technology stacks, architectures, and applications that are quite heterogeneous, and which only rarely align well.

3.1 Operating Functions

Operating functions are composed of Business Components. Such Components are managerially controllable elements:

- collections of **people**,
- the **plans** the people formulate,
- the **decisions** they make,
- the **activities** they carry out,
- and the **results** they achieve.

Central to the structure, function, behavior, and operation of each Business Component is a kernel of technology: the digital components.



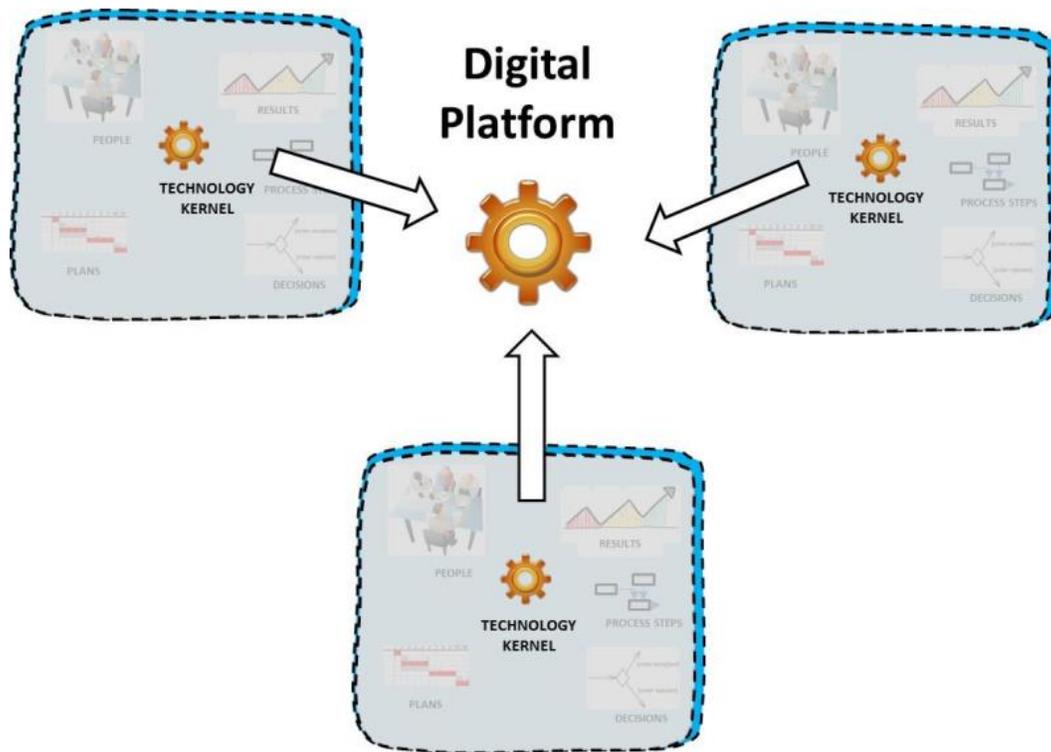
A GENERAL BUSINESS COMPONENT

3.2 What Constitutes the Digital Platform?

Each Business Component depends on functional capabilities as well as provides functional capabilities to others. These capabilities are embedded within a structural framework, a platform that integrates human actions and digital actions. Digital actions are best employed when they are in "reusable" form and able to cover a range of requirements.

Each such action uses an apparatus which contains a kernel of "technology", problem-solving logic mechanism that is sometimes hardware, sometimes software, sometimes both. For each Business Component, the technology kernel participates in an underlying digital framework.

The integration of these individual technology kernels constitutes the Digital Platform.



The Digital Platform is not a single monolithic construction. Rather, it is a federated ensemble of many separate computational resources. Together the combination comprises the aggregate and multi-faceted Digital Platform.

The Story Continues

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