

Digital Lean Management

Unlock potential and achieve next performance levels



Successful companies have achieved outstanding performances by incorporating Lean Management at the center of their corporate transformations. At the same time, the potential of digital technologies to transform performance has become widely recognized. However, we observe two types of lean companies on their way to digital: either companies realize a radical performance increase of up to 50% or more, or become stuck in situations in which initiatives happen in silos, efforts lack coordination, and success is never achieved. This Viewpoint is about transforming companies to digital lean by developing their lean capabilities and embedding technological building blocks into their value streams.

“Traditional Lean Excellence” and new digital potential

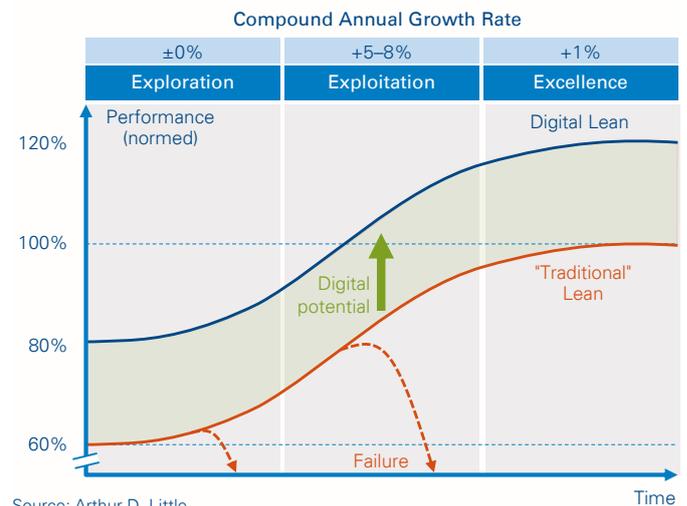
Lean companies develop their capabilities and processes continuously as part of their culture. Continuous improvement allows lean companies to align their activities flexibly, according to business strategy. As a consequence of this holistic alignment, these companies achieve relatively high performance levels compared to their competitors.

A recent Arthur D. Little automotive study classified the lean lifecycle into three phases and determined annual company growth rates in each phase. Using a key automotive productivity indicator (“hours per vehicle”) as a measure, the correlation with with lean implementation was analyzed.

Performance growth of up to 8 percent is common during the Lean Exploitation phase. This decreases as performance improves, and tends to stabilize at around 1 percent in the Lean Excellence phase. Digital technologies have the potential to make a further step-change improvement across all phases. Similar trends have been identified in other industry sectors.

Companies that are able to consequently rely on lean principles and embed digital enablers overcome traditional barriers and unlock digital potential. This results in a radical shift of the traditional Lean Excellence performance and new value propositions for the customer.

Performance growth rates along the lean lifecycle



Source: Arthur D. Little

Lean foundation of outstanding organizations

Even decades after “The machine that changed the world,” still many lean journeys fail. Companies often focus on tools rather than philosophy, and on waste removal rather than customer value. Disappointing incremental improvements and lean “fatigue” are the main symptoms.

Integrating lean principles into digital transformation helps achieve radical simplification of the process, allowing companies to identify the most effective levers for the digital journey.

Before discussing how to unlock the digital potential, and given the importance of the lean foundations, we therefore briefly repeat the three core elements of outstanding lean organizations.

The three lean core elements of outstanding organizations

Core 1: Leadership and culture

Whether in daily routine or times of transformational change, leadership and distinct roles and responsibilities provide the cornerstone for effective collaboration. Clearly formulated expectations, derived from top management's vision and based on a cross-functional understanding, help to make management and delegation effective. This mind-set nurtures the culture of continuous improvement.

Core 2: Targets and performance management

Continuous improvement and transformation start with setting clear targets. These targets need to be designed both vertically (organizational hierarchy) and horizontally (end-to-end value-stream orientation). Performance management assures the effectiveness of measures taken through better leadership quality and clear focus on the waste-free value stream.

Core 3: Kaizen platforms

Lean is not about methods and tools only, but about addressing the right problem to the right set of employees with a problem-specific approach. Continuous improvement can be seen as continuous training, and is therefore a sustainable way of developing employees. The improving "Kaizen" platforms, whether for self-contained improvement problems within a defined organizational unit, or for cross-functional/cross-site problems, need to be designed integrally – not additionally.

Shifting from lean to digital lean

Radical shifts in performance are the consequence of embedding proven technologies in the value stream to overcome factors that have traditionally limited performance.

Typically, it is unclear where to start the digital lean journey and how to prioritize a company's efforts and resources to drive tangible results. Indeed, choosing from among the plethora of new options provided by digital technologies is a real challenge.

Most companies struggle to find the right approach to effectively grasp the benefits of this digital promise.

The following three key questions define a framework to unlock the potential of digital to create value and drive higher performance.

How to radically simplify the traditional value stream?

The full digitalization potential of the value stream is derived from a two-step Digital Greenfield Design approach, based on two key questions:

1. Which physical process steps can be automated by mature and proven technologies?

First, design a Greenfield value stream. Traditional performance limits that are inherent to the value-stream design are overcome by the use of mature technologies. Once a process step is automated (e.g., by using autonomous transport in logistics), upstream and downstream effects need to be reconsidered (e.g., the impact on loading/unloading). This procedure is repeated for the complete value stream.

2. Which remaining non-physical (information) process steps can be digitalized radically?

Second, redesign information processing, especially manual tasks, radically, whether by incorporating digital twins or the use of supporting technologies (e.g., Robotics Process Automation, Artificial Intelligence, bots).

Which technological building blocks to use to create new value?

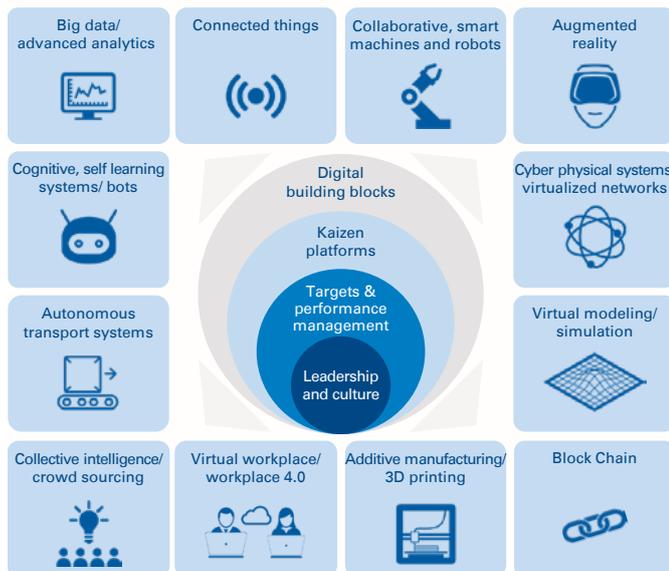
Unlocking an organization's digital potential requires a combination of deep knowledge of mature, proven technologies and the identification of specific functional applications. Each company therefore needs to configure its own set of technological building blocks to address its organizational characteristics and priorities.

Five categories of technological building blocks are defined in Arthur D. Little's digitalization framework, "Future of Operations" (See "[Future of Operations in the digital world](#)"; Viewpoint 2016.) This classification helps companies to trace operational needs to the relevant building block

- **Cognitive:** use pattern recognition based on (big) data for automating tasks (e.g., big data/advanced analytics, bots, autonomous transport systems)
- **Connected:** incorporate machines, tasks, etc., through the cross-functional use of information (e.g., collaborative, smart machines and robots)
- **Virtual:** leverage productivity by decoupling and transforming physical conditions into virtual spaces (e.g., cyber-physical systems, augmented reality)

- **Human centered:** design new workplaces through the use of collective knowledge (e.g., collective intelligence, virtual workplace)
- **Value-add:** define new business models through the use of new core technologies (e.g., additive manufacturing/3D printing)

Integral concept combining Lean Management with building blocks from Future of Operations



Source: Arthur D. Little

Building blocks are interdependent, and therefore need a holistic and integrated design. They apply across the organization, in both direct and indirect business functions, for which results are sometimes even more impressive (e.g., through Robotics Process Automation (RPA), in production planning and finance). The company-specific set of building blocks is derived from its value-stream requirements and requires a profound understanding of each technology.

Which pitfalls to avoid?

Companies that simply introduce technological gadgets, without considering the value stream holistically, run the risk of failure. Digitalization may still happen, but only in silos, meaning that these companies will struggle to fully exploit their digital potential.

There are several reasons why digitalization needs to build on the three core elements of Lean Management, which, in practice, are often ignored. These include:

- Issues related to deficient value streams and/or poor data quality are seldom overcome by using sophisticated technologies
- Digitalization of processes with poor (data) quality risks making existing shortcomings even worse

- The local, workplace-specific application of technological gadgets seldom leads to radical simplification at the enterprise level
- Technologies which, at first sight, seem easily applicable, may lack maturity, causing frustration for employees
- Radical simplification requires a holistic approach to value-stream transformation

Developing digital lean capability to build a long-term and sustainable competitive advantage

The ability to effectively and efficiently digitalize an organization's value stream is, unquestionably, a source of future competitive advantage.

Identifying and integrating the most appropriate digital technology into the value stream requires a profound understanding of all related business processes, as well as a sound understanding of the technologies on offer and their relative maturity.

As with Lean Management, developing the required capability and establishing the required mind-set throughout the organization remains a top-management issue. The more employees and managers adopt this new digital lean mind-set, the sooner efforts to digitalize will therefore succeed in delivering step changes in business performance.

Insights for the executive

In order to be successful and overcome traditional barriers, companies need to ensure that lean principles are well integrated into their digital transformation.

In order to do so, and to fully exploit their digital potential, companies need to:

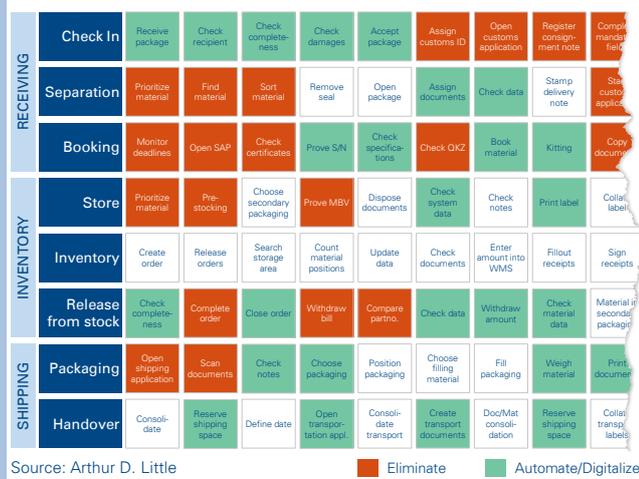
1. Use lean principles to radically simplify the value stream. A Digital Greenfield Design can be used to identify the digital potential in the value stream
2. Select the right building blocks based on their specific value creation potential. This requires broad and profound knowledge of state-of-the-art technologies
3. Avoid digital shortcuts, as they typically fail or lead to disappointing or unsustainable results
4. Start developing a lean digital capability that will form the basis for a long-term and sustainable competitive advantage. This implies a cultural change in the organization and requires top-management attention

Completing these four actions will allow companies to achieve radical shifts in performance levels by combining digital and lean.

Case example: Unlocking the digital potential of a logistics player

Figure below shows a logistics industry example, in which the application of Digital Greenfield Design led to a reduction of 50–80 percent of traditional manual tasks. The digital value stream heat map visualizes the radical simplification of the value stream of this company.

Digital value stream heat map visualizing radical simplification for a logistics player



One-third of the initial process steps and tasks were identified as waste, and hence eliminated.

For another one-third, technological building blocks for automation and digitalization were identified. Autonomous transport systems and robot-driven storage removed all walking distances. As a result, productivity increased by 20 percent.

Another important building block was the substitution of manual reading of non-standardized documents and data entry by automated scanners with machine learning. This allowed additional productivity gains through parallel processing.

The use of smart tags (bar codes), including all relevant data for processing along the entire value chain, was combined with that of smart gloves, which scanned the bar codes by one pick. The failure rate in data entry was heavily reduced, and real-time data allowed significant acceleration of the material flow in the warehouse.

Finally, the remaining one-third of the process steps were subjected to a radical workplace redesign, with completely different requirements for the employee.

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