The Road to Digital Transformation Success: A Methodology to Modernize Operational Excellence

LNS research

Manufacturing companies can increase the probability of success with Digital Transformation if they use a proven methodology to define and achieve Operational Excellence. While every organization is different, and industry, geography, and business size impact actual results, there are basic elements that generally apply across all types of manufacturing and asset intensive industries.
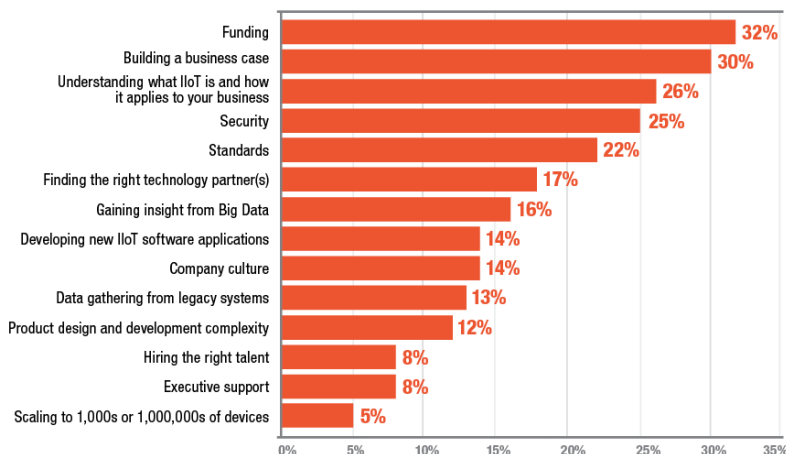
To Succeed, We Must "Get Out of Our Own Way"

The largest hurdles businesses face today as they attempt Digital Transformation are not technology or organizationally related. Instead, they face a crisis of communication and collaboration.[1] Even when there is a desire to implement something as powerful as Industrial Internet of Things (IIoT) technology, obstacles like funding, building a business case, and understanding how it will help all boil down to those two fundamental factors.

Some organizations have made progress in adapting and managing the challenges of the convergence of information and operational technology, and they have a plan on where to go, i.e. an Operational Architecture. But even those that have made actual progress towards transformation barely creep along.   The hurdle that most often holds companies back is that they haven't navigated the bridge between strategic vision setting and Operational Architecture: defining Operational Excellence. Companies that truly embrace Digital Transformation as a way to institute new business models or achieve greater competitive advantage do what's necessary to "get out of their own way" – eliminating the challenges that stand between them and their target.

> Digital Transformation doesn't just happen, it isn't as simple as buying new technology, and it certainly isn't a destination.
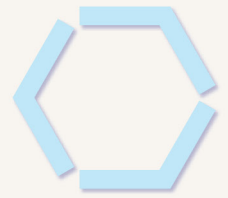>
> **Dan Miklovic**
> Research Fellow

What are the top challenges your company faces in deploying IIoT technology?
(N=269, all respondents)

Challenge	Percentage
Funding	32%
Building a business case	30%
Understanding what IIoT is and how it applies to your business	26%
Security	25%
Standards	22%
Finding the right technology partner(s)	17%
Gaining insight from Big Data	16%
Developing new IIoT software applications	14%
Company culture	14%
Data gathering from legacy systems	13%
Product design and development complexity	12%
Hiring the right talent	8%
Executive support	8%
Scaling to 1,000s or 1,000,000s of devices	5%

LNS has observed large, well-known, and even industry-leading organizations attempt well-meaning yet isolated or impractical tactics to establish Operational Excellence in their Digital Transformation effort:

- Examine every business process for "core versus context" and criticality quotient
- Pore over existing technology justification explanations to determine if the enterprise is using what it already has as it intended
- Identify areas where employees are using personal technology because the company doesn't help them do their job most effectively

Digital Transformation doesn't just happen, it isn't as simple as buying new technology, and it certainly isn't a destination. Most companies now understand what Digital Transformation is, and why it's necessary. The important and more difficult question they're now asking themselves: "What's the best way to conduct it?"

> Companies that neglect defining (and measuring) Operational Excellence often miss the mark on Digital Transformation initiatives.
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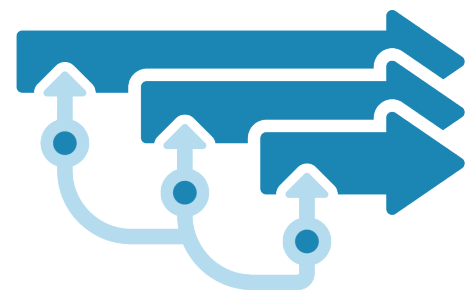> Research Fellow

Framework for Success

LNS Research prescribes a proven five-element framework that encompasses key activities to achieve results from a Digital Transformation initiative. Three of the five are common in most organizations already: setting the vision, building a business case and selecting vendors.

Most of the time companies undertake a technology project to help achieve its vision. Building a business case or project justification and vendor selection are routine efforts, although research by LNS indicates they often are executed poorly. Other research by LNS provides numerous recommendations on how to conduct those activities effectively. Even the fourth step, laying out the architecture of the people, processes, and technology required to achieve the vision is also well documented by LNS in our research report on Operational Architecture.

Companies that neglect defining (and measuring) Operational Excellence often miss the mark on Digital Transformation initiatives. This element feeds and positions the other steps for success, but it also creates "stickiness" so that culture changes are sustainable.
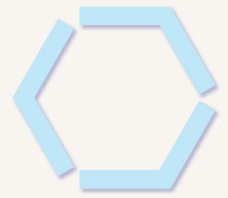
DIGITAL TRANSFORMATION FRAMEWORK by LNS Research describes a systematic approach to simultaneous and interconnected digital initiatives, in order to manage transformation across all levels and functions of the organization.

Click to learn more about the
Digital Transformation Framework

Back to Basics – What Exactly Is Operational Excellence?

It's impossible to "do" or achieve Operational Excellence without understanding what it is. At its most basic level, Operational Excellence means aligning people, process, and technology capabilities to create a culture of continuous improvement and bridge the gap between strategic objectives and operational architecture. Ultimately technology executives and business leadership can operate collaboratively instead of independently.

Unfortunately for many organizations, their approach to Operational Excellence is somewhat cavalier – "I'll know it when I see it." This posture and attitude have infiltrated many aspects of business, from quality to sustainability with Operational Excellence falling victim far too often.

Many companies consider Operational Excellence an extension of their Lean journey and they view it as an end goal for Lean efforts. Others see it as a reflection of business process improvement (BPI) or management (BPM) activities designed to drive the business to better performance. If an enterprise is pursuing Lean, they tend to define Operational Excellence in terms of Lean. If it organizes itself around something other than Lean, such as workplace safety, then Operational Excellence is defined in terms of incident rates and lost time. "Lean" and "BPI" in and of themselves are valid, noble, and effective tactics. However, they are extremely narrow definitions of Operational Excellence and don't truly serve the breadth of functions in an industrial setting.

LNS has a broader definition of Operations Excellence. Manufacturing and asset intensive industries must manage themselves with a balanced set of five drivers or fundamental pillars of Operational Excellence:

1. [Asset performance management](#) (APM)
2. [Environment, health and safety](#) (EHS)
3. [Quality management](#)
4. [Industrial energy management](#) (IEM)
5. [Manufacturing operations management](#) (MOM)

In some sectors, new product development and introduction (NPDI) or supply chain management (SCM) is more relevant than one of the other pillars, and so would replace that pillar as appropriate.

Operational Excellence is characterized by consistent and reliable execution across all operational aspects of the business at a level that puts it well ahead of the competition (known as a Market Leader in the LNS maturity framework). Since Digital Transformation is tied so closely to strategy execution, defining Operational Excellence requires setting the key performance indicators (KPI's) and metrics for
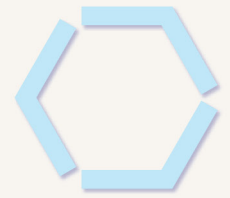
the relevant operational pillars and for the people, process and technology aspects that define the business model shift that Digital Transformation enables.

Who Owns Operational Excellence Anyway?

LNS pointed out recently that many organizations succeed in establishing a collaborative environment at the execution level yet functional leaders still operate within their own silos.[2] One of the missteps that creates this situation is when the CEO or executive team hears the term "Digital Transformation" and immediately concludes that they should pass the effort to the CIO. CIOs, who are frequently looking for a way to show the relevance of IT to the business, embrace this charge and rush headlong into the effort, looking for projects that can leverage technology.

A better, more effective approach is to form a leadership council to address Digital Transformation and Operational Excellence collaboratively. That is the beginning of the process, but the council's actions will ultimately determine the success of the initiative. They must:

- Select the right members; it doesn't matter if there is a single comprehensive leadership council or multiple councils that interact and collaborate, each one associated with a pillar of Operational Excellence
- Draft a charter (or charter for each council plus a master charter for all)
- Translate strategic objectives into measurable activities
- Establish performance metrics
- Establish communication channels for results
- Create a corrective feedback mechanism to promote continuous improvement
- Sanction and oversee Operational Architecture efforts
- Keep executive leadership informed

How Much Team is Enough?

At LNS we consistently advocate for the use of councils or teams to perform critical steps along our Digital Transformation framework. The process of establishing an Operational Architecture requires a cross-organization multi-discipline team to properly identify and define the elements of technology that must be integrated to help an organization achieve its Operational Excellence goals.

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> Research Fellow
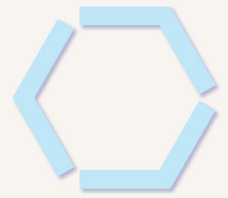
A balanced council is a must. On the one hand, the council must ensure adequate input to meet enterprise objectives and secure buy-in and support throughout the organization. On the other, it must avoid the tendency to satisfy everyone and therefore end up with something that's functional but not very appealing. Adequate representation across departments and job levels can provide for a good cross section without creating an overloaded committee.

One Council Versus Many

One effective format is to establish a new and distinct Operational Excellence council to support Digital Transformation. This would be the case if there are no councils already in place to drive excellence in areas such as quality, asset performance, sustainability or others.

On the other hand, some companies already have one or more committees or councils with in place to drive excellence in quality, manufacturing or others, and that have executive sponsorship. This foundation means that there are likely already roots in place to support a Digital Transformation Council. In this case, the most expedient approach is often to simply broaden the charter of these groups to include Digital Transformation as part of their agenda. This, of course, implies that the right people are already part of the effort.

The Right Representation

Unfortunately, this may not be the case, particularly when the Operational Excellence focus is specific to an initiative such as quality or sustainability and led by a team from a functional silo. Quite often the committee in this kind of situation has a narrow operational focus and may not have the right participants from key technology areas. If the company's intent is to preserve functionally focused Operational Excellence teams, representatives from the following disciplines should have representation on those teams as well:

- Chief Digital Officer
- Chief Information Officer
- Enterprise architecture program
- New business development

By including representatives from these four key areas in a Digital Transformation initiative, councils avoid the tendency to (1) focus strictly on process, (2) overlook the impact of technology, and (3) ignore new business opportunities.

For these additional participants to contribute, a functionally-focused Operational Excellence council should expand the charter to add the following key core principals to those that already drive the council's activity:

> By including representatives from these four key areas, a Digital Transformation council can avoid common pitfalls: Chief Digital Officer, CIO, enterprise architecture, new business development.
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> Research Fellow
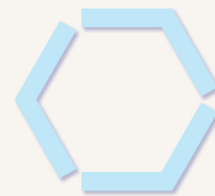
- Examine ways to leverage technology to accelerate and institutionalize process improvement
- Identify key information required (plus where it is generated, communicated and stored) to measure performance
- Identify the time value of information used to gauge performance
- Identify how the company can leverage the information to drive new business opportunities, either for new revenue streams or to solidify customer relationships

When there are no existing Operational Excellence councils, teams or initiatives, and Digital Transformation is a management strategic objective, then the organization must form one to complete this vital step between strategic objective setting and defining the Operational Architecture. Creating a council from scratch is a more complex undertaking than merely extending existing councils since the functional business leaders need to buy-in to the activity as well as the digital advocates. Keep in mind that the main charter of this group is to translate Strategic Objectives related to Digital Transformation into key performance indicators, metrics and concrete tactics, the representatives listed above are all needed plus representation from:
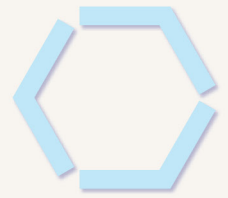
- Operations management leadership
- Product design, development, and introduction
- Asset performance management
- Environment, health and safety performance
- Sustainability and energy management
- Quality, compliance and risk management
- Supply chain management
- Other functional groups that are core to business success

Of course, not every business will need representation from every area since some may not be relevant to the company's specific industry, style of manufacturing, or style of service delivery. The charter of this group must include the four tasks listed as items to be added to functional group charters and should include:

- Understand functional Operational Excellence KPI's and metrics for each operational pillar relevant to the business
- Define KPI's to gauge digital technology adoption
- Define benchmarking objectives

OPERATIONAL EXCELLENCE COUNCIL REPRESENTATION CHECKLIST

1 New business development

2 Operations management leadership

3 Product design, development and introduction

4 Asset performance management

5 Environment, health and safety performance

6 Quality, compliance and risk management

7 Supply chain management

8 Chief Digital Officer, Chief Information Officer

9 Enterprise architecture

10 Chief Digital Security Officer, industrial cyber security

**11** Other functional groups that are core to business success

Translate Strategic Objectives into Measurable Activities

While the approach to forming an Operational Excellence council may vary, once that council is in place and it has a charter, it's time to translate strategic objectives into measurable activities. While it is important to translate all Strategic Objectives into Operational Excellence metrics, this guide focuses only on those most closely associated with Digital Transformation. Additionally, this is not to imply that Strategic Objectives related to operational pillars such as "be among the top ten highest ranked companies in the industry in sustainability," or "highest customer
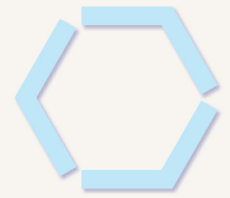
satisfaction" are not influenced by Digital Transformation; they are. It is important to understand that these Strategic Objectives are generally measured using metrics associated with EHS or quality programs, respectively.

The challenge becomes to understand how digital technology can help an enterprise achieve better performance in operational pillars plus measure the success of driving Digital Transformation across the organization. The council can make progress in this area by striving to understand what should be possible and recognizing that the enterprise doesn't know what it doesn't know.

At this educational stage, the council conducts benchmarking to determine what best-in-class performers are doing today and how they judge their success. A formalized process to identify direct and potential competitors and understand their attributes is beneficial. Some of this work can be done through participation in cross-industry councils or activities and augmented with input from trusted third-party advisors like analyst firms, consultants, professional societies and vendor user groups.

Establish Performance Metrics

After benchmarking is complete, it's time to establish the metrics that provide insight into performance. Too many metrics can be just as bad as having as too few metrics. According to the LNS research on "Metrics That Matter," conducted in conjunction with Manufacturing Enterprise Solutions Association (MESA), when an organization tries to measure too many aspects of something it tends to lose track of primary and derivative factors.[3] In general, it is always better to measure something directly instead of measuring a derivative and then trying to compute the actual value. Certainly, there are times when measuring a primary variable is impossible or not a cost-effective exercise, and measuring a by-product or derivative can provide a good approximation, but those cases should be the exceptions. This is why understanding which activities contribute to Operational Excellence overall, and to Digital Transformation specifically is so important.

Establish Communication Channels for Results

Once the enterprise has identified success metrics and starts measuring performance, the next step is to communicate how well the organization is doing. Communication should be expansive and transparent – from top floor to shop floor, and in terms everyone can understand. Imagine driving a race car in a crowded field, like the Indy 500. As a driver, you would be severely handicapped if you had no idea how fast you are going, what position you are in, what current fuel consumption is, or lack any other metric that helps drivers gauge performance. Knowing where you are and what you need to do would be nearly impossible

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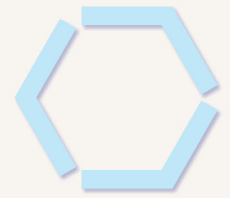
relying on visual cues of those around you. Now imagine the entire racing team faces the same predicament, and only the team owner, isolated in a skybox has a picture of the entire situation. Too many manufacturing organizations view metrics the same way. They hoard them among top management and the people actually executing day-to-day activities and driving performance don't have insight on how well the enterprise is doing.

Operational Excellence requires everyone in the organization to continuously strive for optimal performance. This means that everyone needs to see how well they and the entire organization is doing. Developing a communications channel to share the measure of success is as important as the measurement itself. Some metrics can and should be communicated in real time, while others may not be as time sensitive or the information is meaningful only when considered over a period that does not necessitate real time reporting.

Putting a communication vehicle in place is the last part of getting ready for Operational Excellence; the next step is taking action to gain momentum and keep that momentum going. The organizations that do this well are those with a corporate culture that weaves in underlying activities into the everyday fabric of the business. Whether it is Lean, quality, asset performance or Digital Transformation, organizations with a high degree of capability maturity have all progressed to the point that specific Operational Excellence behaviors are part of every job. Making Operational Excellence a part of the culture, particularly where Digital Transformation is concerned is critical to success.

Create A Corrective Feedback Mechanism

A corrective feedback mechanism promotes continuous improvement, which has been the basis of Operational Excellence ever since W. Edwards Deming introduced his approach to quality management. The Plan-Do-Study-Act (PDSA) cycle, Plan-Do-Check-Act (PDCA) cycle, or the Deming Cycle defines how organizations should pursue continuous improvement. The Deming Institute, has considerable material, training, and content about the process.
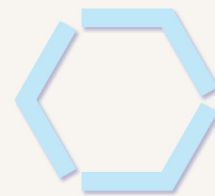
Companies sometimes fail to fully understand the feedback element of continuous improvement. Just as with any control related problem, feedback is essential to maintaining process stability, but just as in the control world, feedback can also create problems. Without feedback, it is difficult or even impossible to maintain steady performance improvement. Too much feedback could cause Operational Excellence efforts to become so excessive that the result is worse rather than better performance. The best ways to avoid excessive feedback vary depending on organization size, existing culture, geographical factors and the nature of the workforce.

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Dan Miklovic
Research Fellow

Sanction and Oversee Operational Architecture

In our Operational Architecture research spotlight, one of the success factors emphasized is executive oversight. This ensures that technologists continuously receive reminders about the business issues that should drive any technology plan. The council that leads the Operational Excellence initiative is perhaps in the best position to provide executive oversight. Since creating an Operational Architecture immediately follows Operational Excellence in the LNS Digital Transformation framework, continuity in leadership across activities can accelerate progress help to quickly resolve questions that will arise as the technology-focused architecture team tries to interpret business guidance.
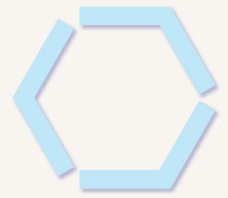
Keep Executive Leadership Informed

The final ingredient for Operational Excellence is keeping executive leadership informed of progress, roadblocks, and performance. These are, after all the individuals who set strategic objectives and chart the course of the enterprise. Just as the Operational Architecture team must provide insight to the Operational Excellence council and receive oversight, the Operational Excellence must do the same. Thirty-thousand-foot fly-by updates that simply gloss over issues won't cut it. While that approach might make the C-suite feel good, it doesn't help keep Digital Transformation on track.

The communication must be accurate, timely and honest. Consistent in frequency, and the right blend of written and face-to-face communication will keep them engaged and give them what they need to do their jobs. The cadence will depend on factors like the scope of Digital Transformation, the competitive environment and urgency for change, and the organization's financial and cultural capacity for change.

# Summary and Recommendations

Using a proven methodology for defining and achieving Operational Excellence, manufacturers position themselves to achieve goals faster, at a lower cost, and with better results than relying on a less structured approach. Each of the steps and activities described directly contributes to process improvement and success with Digital Transformation. Despite differences in manufacturing style, industry, geography and business size, applying the basic elements with rigor will enable those in manufacturing and asset-intensive industries to achieve results.

Specifically, organizations that want to achieve Operational Excellence to pave the road for Digital Transformation should:

1. **Understand what Operational Excellence really means in context of Digital Transformation**. Using a definition that is too broad, too narrow or even slightly off-base won't help the business toward Digital Transformation. In fact, the wrong definition could lead to a "bad" roadmap and sabotage the effort.

2. **Create a strategy for Operations Excellence**. Using a proven strategy can help the organization accelerate and validate first steps, and will keep efforts on-track into the future. While the business may evolve, and the stakeholders may move on, a solid strategy will survive and support even the most turbulent changes within and outside the organization.

3. **Form an Operational Excellence council; ensure the right representation**. It's not enough to gather the people who are most eager for Digital Transformation, or who may feel the most immediate impact from it. It's critical to gather a thorough cross-section across functions and levels throughout the company to ensure the council considers every aspect that may affect or experience the effects of Digital Transformation.

4. **Look to the right people for help**. Certainly, vendors and consultants have a tremendous amount of experience and a wealth of insight to offer, as do their clients. However, exercise caution against getting pigeonholed into systems or platforms that might not be quite right for the business. Look to impartial third-parties like research and analyst firms, or consulting companies that do not specialize in any one "flavor" of solution.

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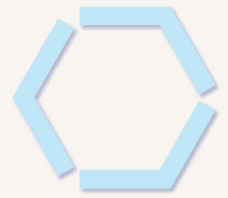
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[3]Hughes, Andrew. *Manufacturing Metrics in an IIoT World*. LNS Research. April 26, 2016. Accessed August 14, 2017. http://www.lnsresearch.com/research-library/research-articles/-ebook-manufacturing-metrics-in-an-iot-world-measuring-the-progress-of-the-industrial-internet-of-things.

Author: Dan Miklovic, Research Fellow
Email: dan.miklovic@lns-global.com

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