Emerging Technologies in Manufacturing

How Datacenter Investments & Strategies Create Network Effects

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Executive Summary

Thriving Manufacturers Use Analytics and Automation to Drive Productivity

IDC performed an in-depth study of manufacturers to better understand their ability to create competitive differentiation in a hypercompetitive industry. Becoming more productive and profitable is just as important as the ability to protect brand and intellectual property.

The study looked into the challenges manufacturers face and their investment strategy and vision for datacenter resources. By and large, manufacturers that were more productive and profitable (“Thrivers”) have embraced process automation, predictive maintenance, and supply chain optimization through modernized datacenter resources.

Manufacturers’ investments in emerging technologies and modernized datacenter resources enabled them to:

» Become more profitable by improving speed to market
» Support innovation and increased productivity
Executive Summary (continued)

Thriving Manufacturers Use Analytics and Automation to Drive Productivity

Thrivers Recognize the Interconnectedness of Technologies

Thriving Manufacturers Create Competitive Differentiation Through Better Quality and Productivity

Stemming from investments in emerging technologies and modernized datacenter resources, thriving manufacturers are:

- **MORE PRODUCTIVE**
  - 2.5X more new products and services
  - 1.5X faster to market with new offerings
  - 2.4X more productive employees

- **BETTER AT REDUCING OPERATIONAL COSTS**
  - 3.3X lower operational costs
  - 2.3X increased revenue

- **BETTER AT RETAINING CUSTOMERS**
  - 2.7X better customer retention
Global Research Methodology and Definitions

In 2018, IDC conducted a global research study to better understand the linkage between digital use-case deployments, investment in emerging technologies, and business outcomes.

Survey attributes

- 1,221 mid- to large-sized organizations
- IT & LOB respondents
- 4 regions and 14 countries
- North America, Latin America, EMEA, and Asia Pacific/Japan
- Leading industry verticals with the greatest digital use-case deployments, including banking, discrete manufacturing, retail, healthcare, and life sciences

Based on the outcomes achieved, IDC grouped study participants into four categories. Those with the most positive business results are called “Thrivers” and those that lagged in positive results are called “Survivors.”

Additionally, IDC conducted 16 in-depth interviews with organizations to dig deeper into the business value and real-world deployments thriving organizations have made.

Full research results were published in a Dell EMC and Intel-sponsored IDC White Paper: “Emerging Technology and Modern IT: The Key to Unlocking Your Data Capital.”
Defining Characteristics of Manufacturing Leaders

Leading manufacturers are harnessing their investments in modernized datacenters and emerging technologies to improve brand strength, increase productivity, maintain customer loyalty, and protect intellectual property.

Attributes of Leading Manufacturers Include...

**Advanced data control and agile development**
- Ability to protect and control data with replication, snapshot, backup, archive, and continuous availability and recovery technology. Thrivers had this ability at a rate 6.6x that of Survivors.
- Thrivers are 7x as likely to have continuous development, test, and deployment capability.
- Almost half of Thrivers have embedded big data, analytics, ML and AI within their IT and datacenter management processes, versus just 2% of Survivors.

**Enablement of accelerated compute to power AI**
- Half of Thrivers are using accelerated computing technologies such as servers optimized with GPUs and FPGA technology.
- One-third of Thrivers have invested in all-flash storage, versus just 2% for Survivors.
- Thrivers depend on hyperconverged infrastructure at a rate 11x higher than Survivors.

**Reliance on automation**
- 63% of Thrivers had the ability to automatically configure and provision IT resources; none of the Survivors had this ability.

**Enhanced security**
- Thrivers are 5.6x as likely to have enhanced datacenter security provisioning.

In contrast, Survivor organizations lack a unified strategy around productivity, operational efficiency, and customer retention. They invest in advanced datacenter technologies at lower rates and are less mature in their digital use-case deployments.
Improving Quality and Productivity

To be competitive, manufacturers need to find ways to improve quality and increase production output. At the same time, protecting brand reputation and intellectual property is critical.

For manufacturers, these priorities are viewed as discrete and opposing challenges, with each requiring their own separate investments in IT services and infrastructure. Leaders handle it differently. They recognize the interconnectedness — or “network effect” — of their investments in IT.

Modernizing IT in the datacenter serves as a springboard for investing in emerging technologies such as AI, ML, and big data analytics. These technologies are proving to help manufacturers redefine their productivity and product quality levels and reimagine innovation.
Manufacturing Thrivers Excel Through...

**Better Business Outcomes**

**A Mindset for Innovation**
- 26x better ability to innovate
- 2.4x more product and service offerings
- 2.6x shorter time to market for new products and services

**Using Data to Drive Productivity**
- 18x better able to leverage data
- 2.4x more productive employees
- Relying on data to shift from reactive to predictive maintenance

**Operational Excellence to Fuel Positive Outcomes**
- 2.7x better customer retention
- 3.3x lower operational costs

**Use Case Examples**

**Experience Use Cases:**
- Equipment health
- Real-time claims management
- Digital showroom

**Data Uses Cases:**
- Asset instrumentation
- Thinking supply chain
- Real-time scheduling

**Innovation Use Cases:**
- Advanced digital simulation
- Model-based design
- Collaborative development
Thrivers Deploy More Advanced Technologies in Their Datacenters

In their own datacenters, manufacturing thrivers report technology deployment rates that improve operational efficiency, ensure security, reduce management complexity, and reduce provisioning times.

MANUFACTURING THRIVERS ARE:

- **63%** more likely to have deployed automated configuration and provisioning.
- **24X** as likely to have deployed storage for unstructured data (all flash/hybrid).
- **21X** as likely to have deployed accelerated computing using GPU or FPGA optimized servers.
- **20X** as likely to have embedded big data, integrated analytics, ML/AI and cognitive capabilities within IT and datacenter management processes.
The Interconnectedness (or “Network Effect”) of Investments in IT

IDC research shows that thriving banks share similar approaches regarding investing in and adopting emerging technologies.

Notably, they plan with the foundational assumption that emerging technology adoption is a longer-term process to ensure that the IT and datacenter resources to support manufacturing operations have the insight to drive efficiency and improve security.

**Thrivers Think Ahead, Experiment, and Are Willing to Adapt and Change Course**

By threading together emerging and modern datacenter technologies, manufacturers are creating force-multipliers that allow them to improve productivity and quality through automated processes and supply chain optimization. The ability to monitor and manage processes and data in real time uncovers areas to improve.
Real-World Experiences of Thriving Manufacturers

Uncovering areas of improvement with audits, self evaluation
“The only way to truly grow is to ask yourself what is wrong. Are we automating mediocrity? It’s the really brutal, hard questions that you have to ask yourself to keep growing.”

Quality as a Competitive Differentiator
“We could go into price wars all day long, but I’d rather use analytics and big data to improve product quality. ...Analytics offers manufacturers the opportunity to step up and get a better class of customer.”

Enabling Co-Creation
“Our systems can flex now because they’re cloud-based. We have the ability to provide customers 100% visibility into what’s going on in manufacturing. Our customers want to be co-creators in creation.”

“We have enabled more collaborative design in our product areas...allowing us to expand our ecosystem.”

AI, ML, and Big Data
“We use (IoT) for real-time monitoring across the shop floor...our customers believe that real time manufacturing is indispensable for their business models.

“With big data we’re improving our ability to manage and service our operational assets, thus lowering the costs and increasing reliability.”
Becoming a Thriver

To become a Thriver, manufacturers must be able to unlock the value of data and leverage the interconnectedness of their IT investments.

Thrivers recognize that modernized datacenter resources are the foundation for supporting emerging technologies. By automating processes, optimizing the supply chain, and shifting to real-time monitoring and management, they are able to dramatically improve productivity, efficiency, and quality.

Want to become a Thriver? Here are the key questions to ask:

Are my datacenters up to the task?
- Can my datacenter resources support the demands of emerging technologies?
- Do my datacenters support agility through on-premises and cloud infrastructure?
- Have I invested in technology that reduces management complexity?
- Can my systems gather, cleanse, protect, and organize data for advanced analytics?

Am I prepared for the people & processes part of change?
- Are my current employees able to scale the learning curve and navigate disruption to existing processes?
- Can I close the skills gap with trusted services?
- What training will I need to implement to help staff transition to data-driven technologies such as thinking supply chain, smart warehousing, and predictive maintenance?

Am I prepared to overcome internal barriers to change?
- How can I show examples of product quality improvements and reduction of waste as measures for success?
- Can I develop a playbook that evangelizes the benefits of collaborative product development and supply chain optimization?
- Do I understand the hurdles and roles that will gain cross-organization buy-in and garner the full benefits of emerging technology?

Am I ready for AI?
- Is all the data that my facility gathers and stores able to be leveraged? What will it take to cleanse and organize this data?
- Do I have a plan to protect and anonymize data?
- Can my organization gather data on products after they are sold and implemented to gain insights on usage and areas to improve?
Key Takeaways and Next Steps

» Thrivers in manufacturing are able to innovate to develop new products more quickly:
  • Using modernized datacenter resources, Thriving manufacturers focus on innovation by:
    » Leveraging data to drive product planning. Fewer changes mid-course makes an enormous impact on production times
  Leveraging data to drive collaboration, co-creation and development of expanded ecosystems for products.
» Thrivers are more able to identify areas to improve operational efficiency and reduce the risk of costly equipment downtime

• Using modernized datacenter resources, Thriving manufacturers use data to drive productivity by:
  » Leveraging advanced analytics and machine learning to predict equipment failures before they occur
• Using modernized datacenter resources, Thriving manufacturers can achieve operational excellence by:
  » Leveraging machine learning and cognitive analysis to improve employee productivity and reduce human errors
» IDC recommends developing a new datacenter vision that enables the organization to create “Network Effects” based on their modernized datacenter resources and ability to leverage investments in emerging technologies

Thriving manufacturers have invested in modernized IT and rely on technology such as all-flash storage, hyperconverged infrastructure, and advanced datacenter security provisioning to drive operational excellence. IDC recommends developing a new datacenter vision that enables the organization to create “Network Effects” based on their modernized datacenter resources and ability to leverage investments in emerging technologies.