Reconfiguring

Transforming Manufacturing Operations In The Digital Age

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93% of manufacturers claim manufacturing operations are an integral component of their digital supply chain strategies.
71% of manufacturing digitization efforts are separate but parallel to digital supply chain initiatives.
Digital Pressures: The Manufacturing Improvement Portfolio

- **Emerging Practices**
  - IoT
  - AR/VR
  - Cloud
  - AI
  - Digital Twin
  - Digital Thread
  - Smart Robots
  - Cyber Physical Systems
  - Mobile Factories

- **Peak of Inflated Expectations**

- **Innovation Trigger**

- **Trough of Disillusionment**

- **Plateau of Productivity**
  - Corporate Production Systems
  - Synchronized BOMs
  - Network Design
  - OEE
  - Security
  - Digital Manufacturing
  - Supplier Quality

Source: "Hype Cycle for Manufacturing Operations Strategy, 2018," Gartner 2018
Digital Pressures The Manufacturing Improvement Portfolio

Separate Logic And Emotion

Source: "Hype Cycle for Manufacturing Operations Strategy, 2018", Gartner 2018
Can You Change the Wheels on a Moving Bus?
1. Disrupt How Outcomes Are Approached
2. Automate Beyond The Factory
3. Unlearn and Hack Your Culture
1. Disrupt How Outcomes Are Approached
2. Automate Beyond The Factory
3. Unlearn and Hack Your Culture
Digital Doesn’t Change The Outcome. It Alters Your Approach.

Customer Experience

Cost
Quality
Service Level

Time
Reliability
Transparency
Change How Your Access and Use Production Data

Pace of Discovery, Learning and Execution of Change

Automated

Visibility

Improve

Reconfigure

Understanding

Knowledge

Transform

Breadth of Data Access + Analytical Techniques, and Organizational Capability

Manual, Ad Hoc, Start, Stutter, Stop

Automated

Source: “Artificial Intelligence Will Make Manufacturing Smarter—But a Learning Curve Comes First”, Gartner, 2018
What Can Be Achieved

- Improve Material Yield
- Digitized Production System
- Improve Without Emotion

Source: “Evolve Your Manufacturing Intelligence Strategy to Keep Pace With New Analytics Requirements” Gartner, 2018
1. Disrupt How Outcomes Are Approached
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3. Unlearn and Hack Your Culture
New Operating Models Go Beyond Smart Factories

- Smart Factories
- Product Life Cycles
- Network Design
- Lifecycle Cost

Customer

Demand
Manufacturing Processes/Activities That Are Completely Digitally Automated

Which of the following manufacturing process/activity are completely digitally automated today and which will be two years from now?

<table>
<thead>
<tr>
<th>Process</th>
<th>Today</th>
<th>Two years from now</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reporting/KPI Management</td>
<td>37%</td>
<td>40%</td>
</tr>
<tr>
<td>Materials Logistics</td>
<td>34%</td>
<td>41%</td>
</tr>
<tr>
<td>Production Planning</td>
<td>32%</td>
<td>43%</td>
</tr>
<tr>
<td>Incoming Inspection</td>
<td>34%</td>
<td>22%</td>
</tr>
<tr>
<td>In-process QA/QC</td>
<td>32%</td>
<td>43%</td>
</tr>
<tr>
<td>Product Release</td>
<td>36%</td>
<td>46%</td>
</tr>
<tr>
<td>Changeovers</td>
<td>33%</td>
<td>24%</td>
</tr>
</tbody>
</table>

Base: All Respondents, n = 205, excludes don’t knows
Production Data Is The New Influence: Are You Aligned?

Planning
(Short and Long Term)

Sourcing and Procurement

Customer Service

Logistics and Delivery

Manufacturing Operations

Source: "Survey Analysis: Lights Out Manufacturing is More Than Factory Automation" (G00329420)
1. Disrupt How Outcomes Are Approached
2. Automate Beyond The Factory
3. Unlearn and Hack Your Culture
Smart Manufacturing is a mindset shift and a change to existing organizational culture
Becoming Digital Is More Than Recruitment

*Internal Skills and Talent Concerns Require Attention*

Q: When digitizing the manufacturing operations, what were/are/will your company's top constraints with respect to skills and talent?

<table>
<thead>
<tr>
<th>Constraint</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing employees struggle to embed digital into their day-to-day work</td>
<td>56%</td>
</tr>
<tr>
<td>Lack of skilled workers inside the company to support digitization plans</td>
<td>52%</td>
</tr>
<tr>
<td>No formal career path/skills development for existing employees</td>
<td>50%</td>
</tr>
<tr>
<td>Lack of mentorship programs between new and current employees</td>
<td>50%</td>
</tr>
<tr>
<td>No knowledge management process for capturing undocumented knowledge from subject matter experts</td>
<td>41%</td>
</tr>
<tr>
<td>Inability to recruit and hire from the outside</td>
<td>40%</td>
</tr>
</tbody>
</table>

Base: All Respondents, n = 205, Life Sciences = 41
Percentage of Respondents Sum of Top 3 Rank Shown
Percentages may not add to Sum due to rounding
Develop Digital Dexterity

New Competencies

Human Machine Collaboration

Nurture Natural Interaction

Learn Intelligently

Source: How to Overcome Three Obstacles to Accelerate Innovation in Manufacturing Operations With Bimodal Gartner, 2017
1. Disrupt How Outcomes Are Approached
2. Automate Beyond The Factory
3. Unlearn and Hack Your Culture
You Can Change the Wheels on a Moving Bus!

Source: “Self Assess Your Smart Manufacturing Strategy” & “Understanding the 5 Stages of Gartner’s Maturity Model for Manufacturing Operations” - Gartner, 2018
Reconfiguring Manufacturing Operations In The Digital Age

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