OTTO MOTORS

10 Step Guide to Prepare for Industry 4.0

Areas to consider when modernizing your operation

Intro

Industry 4.0 technologies provide opportunities that were difficult to imagine as little as 5 years ago. As the market evolves, operations need to do more than focus on continuous improvement; they need to disrupt their organization, and ultimately the competitive landscape.

As industry works towards the shared vision of the connected factory (or smart factory), consider this guide as a reference to ensure your asking the right questions and evaluating the right technology.

1. EVALUATION OF MANUFACTURING OPERATIONS

Complete a full review of your operation's processes and equipment to identify challenges, bottlenecks and limitations. Recognize areas within the operation that are high performing, meeting or exceeding KPI expectations. By doing so, your team can build out a strategic plan to determine the right combination of hardware and ERP. This step should help you identify where you are today so you can understand and plan where you need to go.

QUESTIONS TO CONSIDER:

i. Why does the facility need to consider Industry 4.0 capability today?

ii. How is the operation currently performing against our benchmarked KPIs?

iii. What key challenges are causing limitations in our productivity?

2. BUILDING YOUR TEAM

Identify and build the team of people who will evaluate and champion new processes and technologies. This group should be a balance between IT, operations, quality assurance, engineering, executive leadership, and procurement. These stakeholders will be responsible for presenting the business case for Industry 4.0 integration to the review board or steering committee. Therefore, all areas and potential impacts to the business must be considered as inputs to new value-adding solutions.

QUESTIONS TO CONSIDER:

i. Which departments will be disrupted by the implementation of Industry 4.0 technologies?

ii. Who are the key stakeholders from each department that should be involved in the evaluation process?

iii. What criteria will be used to evaluate current and prospective processes and technologies?

3. PROCESS IDENTIFICATION

Processes will be identified in the initial evaluation stage, so now is the time to reflect and analyze how they are performing. Many processes in traditional industrial settings require the use of manual labor. Lines are typically structured in a way that benefits the human personnel and not productivity or the bottom line of the facility. Consider nuances in current manual processes—not just the obvious things like operator movement. It's these seemingly minor details that can create challenges down the road when introducing automation, so identifying them here will support a more plans to mitigate. Technology has adapted to enable human-like flexibility, and real-time tracking of all moving parts. Shift conventional thinking away from habitual practices and realize the potential for intelligent, connected equipment.

QUESTIONS TO CONSIDER:

i. How many machines are in operation that require human input?

ii. To what extent do those machines cause downtime in the facility?

iii. How would throughput improve if material was moved between islands of automation autonomously instead of manually?

4. SAFETY POLICIES

The plant floor is a chaotic environment, and people are not averse to distractions. Despite continuous efforts to improve safety practices in facilities, accidents and injury remain prevalent. Forklift misuse alone accounts for almost 100,000[1] injuries per year. Review safety policies and reports to determine how new technologies can decrease injury. Look outside of specific safety policies and reports to identify other areas of the operation that impact safety, cost savings, productivity and uptime.

QUESTIONS TO CONSIDER:

i. What is the primary cause for injury in the facility?

ii. Are 5S standards being abided in the workplace?

iii. To what extent would injury reports be reduced if autonomous solutions were introduced to the facility and the number of human personnel were declined?

[1] "Forklift Safety" Optimum Safety Management. http://www.oshasafetymanagement.com/blog/forklift-safety-infographic/

5. REVISE BUSINESS MODELS

Businesses must adapt to new models in order to capture value and thrive in an ever-changing market. Disruptive Industry 4.0 technologies unlock potential to adapt new business models such as the monetization of platforms and as-a-service offerings. These types of business models are expected to shift value pools in existing value chains. Determine new business cases for current assets, secure control points in the shifting value chain, and understand the changing marketplace and engrain agility into the operation.[2]

QUESTIONS TO CONSIDER:

i. What assets can be utilized in a more productive manner?

ii. Does it make sense to consider licensing, outsourcing, or monetizing platforms for certain elements of the operation?

iii. What technologies or services can be leveraged to generate new growth centers within the organization?

6. NEXT-GENERATION TOOLS IN MANUFACTURING

So far, the steps have required significant internal review and evaluation. Now it's time to look externally to identify Industry 4.0 tools and equipment that will propel your operation. Scalability, versatility and flexibility are key criteria when seeking such tools, and implementation into the existing facility should have minimal disturbance because of these factors. There are a variety of solutions available that offer advantages for growing, competitive organizations, from self-driving vehicles for material transport to advanced analytics and big data reporting. Set specific objectives that address core challenges outlined in the evaluation phase and ensure solutions allow for integration with other machines and systems.

QUESTIONS TO CONSIDER:

i. Do systems need to integrate with ERP or WMS solutions?

ii. What level of infrastructure and training is required for implementation?

iii. How will data from these solutions be captured, communicated and utilized to improve productivity?

[2] "How to Navigate Digitization of the Manufacturing Sector." McKinsey&Company. 2015. https://www.mckinsey.de/files/mck_industry_40_report.pdf

7. ENTERPRISE NETWORKS

By converging industrial and enterprise networks, manufacturers can advance business agility and build a unified enterprise-to-plant architecture while increasing visibility, improving troubleshooting, and lowering costs. The Industry 4.0 connected factory involves architectural guidelines and products that tie together factory automation systems, enterprise applications, and the wider ecosystem of supplier and partner solutions.[3] For this reason, it is paramount that information technology teams work closely with operations to ensure technical implementations are functional and advantageous for all areas of the organization.

QUESTIONS TO CONSIDER:

i. Is your network scalable?

ii. Can your network accommodate rapid growth?

iii. Do you have the necessary resources to support the infrastructure?

8. SECURITY

A connected factory requires the use of standard communication protocols to enable machine-to-machine communication and life reporting. As a result, secure, reliable communication as well as sophisticated identity and access management of machines and users are essential.[4] This provides opportunity to integrate industrial security and threat prevention across converging networks. As a basic security checklist, networks should include a secure router, firewall, an intrusion prevention system, and wireless IPS; policy-based access control can also be implemented for additional due diligence.[5]

QUESTIONS TO CONSIDER:

i. Have you engaged in a third party security audit?

ii. Do you have the expertise in house to monitor your security?

iii. Do you have a intrusion prevention system?

[3] "The Cisco Connected Factory," Cisco. 2014. http://www.cisco.com/c/m/en_ca/offers/cisco-ind-smart/index.html?keyCode=001214065

[4] "Industry 4.0: The Future of Productivity and Growth in Manufacturing Industries" BCG Perspectives https://www.bcgperspectives.com/content/articles/engineered_products_project_business_industry_40_future_productivity_growth_manufacturing_industries/?chapter=2#chapter2_section7

[5] "The Cisco Connected Factory," Cisco. 2014. http://www.cisco.com/c/m/en_ca/offers/cisco-ind-smart/index.html?keyCode=001214065

9. PARTNERS

From technology providers to integration specialists, it's important to select a supplier who will be your partner for the long-haul. Seek out suppliers who are leaders in their field, offer robust solutions that are scalable, have the ability to integrate with multiple systems, and are willing to build a lasting relationship overtime. The right partner will take time to understand your challenges and identify why you require change. By doing so, partners can provide insight on how their technology can be integrated into your operation in a way that will generate a significant ROI and have sustainable impact.

QUESTIONS TO CONSIDER:

i. Do they provide suggestions as to how their technology can be best used within our operation?

ii. How does their solution complement our other supplier partnerships?

iii. What level of support will be provided?

10. TRAINING & INTEGRATION

As the Industry 4.0 champion in your organization, it's important to educate personnel on the potential that can be unlocked and achieved with advanced technologies. Be transparent by explaining gaps between current processes and forward-thinking objectives. Ensure the workforce understands why these technologies will be implemented and how their role will be impacted—ideally, they will be placed in higher-value, more complex tasks. Determine a plan for restructuring where needed and training protocols required. Look to solution partners to provide guidance and support with communication efforts, integration and training.

QUESTIONS TO CONSIDER:

i. How will we transition our workforce from predominantly human personnel to robotic?

ii. Is support documentation, training videos and or field technicians necessary and if so available to the team?

iii. Who are the integrators for the technology and how accessible are they to our team?

The Final Thought

Industry 4.0 is complex. It is comprised of multiple pieces, used across a variety of applications, and requires strategic planning and change management. Its potential is unparalleled to capabilities available today. The interconnection of machines speaking to other machines that access and analyze centralized operational data, and report that data, will set a new precedence in lean manufacturing.

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Self-driving vehicles have emerged among the new wave of advancing technologies. In manufacturing environments, they are used to connect islands of automation and optimize material transport. In return, manufacturers are finding significantly improved throughput, decreased operating costs, and improved operating density.

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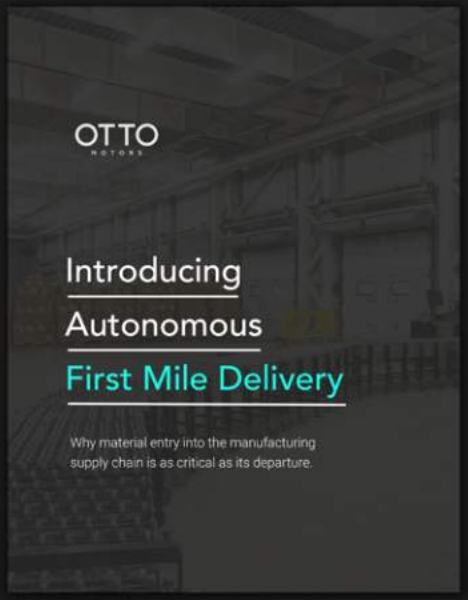

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