# DIGITAL TRANSFORMATION FOR MANUFACTURERS

## DIGITIZATION KEY PERFORMANCE INDICATORS

The following key performance indicators (KPIs) can be useful in monitoring the improvement of a small- and medium-sized manufacturer as it progresses through the Digital Transformation for Manufacturers process. Many of the KPIs can be tracked for a corporation or facility (e.g., manufacturing plant, distribution center/warehouse).

### Absenteeism Rate

The ratio of employee absences vs. workdays for a period.

*Number of unexcused absences for the period ÷*

*(Number of employees X Total workdays for the period) X 100 =*

*Absenteeism Rate percentage*

### Backorders

The percentage of product that could not be provided upon customer request for a given period.

*(Product volume that could not be provided when requested for the period ÷*

*Total volume of requested products for the period) X 100 =*

*Backorders percentage*

### Cost of Goods Sold

The direct costs required to manufacture products, including direct labor costs, overhead costs, and material costs.

*(Cost of goods at start of period +*

*Cost of goods purchased during the period) –*

*Cost of goods at end of period =*

*Cost of Goods Sold*

### Digital-Data Access

The percentage of users with access to data captured via Industry 4.0 technologies.

*(Company users with access to Industry 4.0 data ÷*

*Number of full-time employees and equivalents) X 100 =*

*Digital-Data Access percentage*

### Digitally-Enabled Rate

The percentage of equipment to which smart devices or embedded intelligence have been applied, with the equipment capturing and sharing data.

*(Number of machines with smart devices or embedded intelligence ÷*

*Number of machines for which smart devices or embedded intelligence is applicable) X 100 =*

*Digitally-Enabled Rate percentage*

### Energy Per Unit

The energy required per unit of product output.

*Kilowatt hours of energy consumed in the period ÷ Number of products produced in the period =*

*Energy Per Unit*

### Finished-Product First Pass Yield

The percentage of product that passes final inspection without rework or repairs.

*(Product volume passing final inspection ÷ Total product volume) X 100 =*

*Finished-Product First-Pass Yield percentage*

### OSHA Injuries and Illnesses Incidence Rate

The frequency of injuries and illnesses in the workplace.

*(Number of injuries and illnesses X 200,000) ÷ Employee hours worked) =*

*OSHA Injuries and Illnesses Incidence Rate[[1]](#footnote-1)*

### Inventory Days of Supply (DoS)

The number of days that inventory would last prior to being replenished.

*Number of days in a period ÷ Number of times inventory is turned over =*

*Inventory Days of Supply*

### Inventory Turnover Rate

The number of times an organization or facility turns over its inventory for a given period.

*Value of inventory held for the period ÷ Average value of inventory on hand = Inventory Turnover Rate*

*OR*

*Number of days in the period ÷ Days of inventory supply on hand in the period = Inventory Turnover Rate*

### Machine Availability

The percentage of time that equipment is working and available.

*(Hours that equipment is available in a period ÷*

*Hours that equipment was scheduled to be available in the period) X 100 =*

*Machine Availability percentage*

### On-Time Delivery

The percentage of customer orders that are delivered on time and in full (i.e., in the quantity ordered).

*(Total on-time orders ÷ Total orders) X 100 = On-Time Delivery percentage*

### Manufacturing Cycle Time

The time to produce goods, from the start of production to the completion of finished product.

*Processing/Assembly time + Material-movement time + Wait time + Inspection time =*

*Manufacturing Cycle Time*

### Production Capacity Utilization

The output of a manufacturing facility as a percentage of optimum output.

*(Actual capacity ÷ Optimum capacity) X 100 = Production Capacity Utilization percentage*

### Return on Investment

Financial gains attributed to an investment(s).

*(Net profit from the investment via cost savings and/or increased profits) ÷ Cost of the investment) X 100 = Return on Investment percentage*

### Returned Goods

The percentage of products returned for a given period.

*(Volume of products returned for the period ÷ Total volume of products for the period) X 100 =*

*Returned Goods percentage*

### Rework rate

Costs of finished goods that require fixing or rework so that they can be sold; typically calculated for a period as a percentage of sales.

*(Cost associated with reworked goods for the period ÷ Sales for the period) X 100 =*

*Rework Rate percentage*

### Sales Per Employee

Measure of employee productivity for a period (typically calculated annually).

*Sales for the period ÷ Average number of full-time employees and equivalents for the period =*

*Sales Per Employee*

### Scrap Rate

Cost of finished goods with quality so poor that they cannot be sold or reworked and must be scrapped; typically calculated for a period as a percentage of sales for the period.

*(Cost associated with scrapped goods for the period ÷ Sales for the period) X 100 =*

*Scrap Rate percentage*

### Smart Products

Company products that incorporate smart devices and/or embedded intelligence.

*(Products with smart devices and/or embedded intelligence for a period ÷*

 *Total volume of products for the period) X 100 =*

*Smart Products percentage*

### Smart Product Profit Differential

The difference in profitability of products that incorporate smart devices and/or embedded intelligence vs. products without smart devices and/or embedded intelligence.

*(Profits for all smart products ÷ number of smart products) –*

*(Profits for all non-smart products ÷ number of non-smart products) =*

*Smart Product Profit Differential*

### Supplier Leadtime

The average time it takes from the order of materials and components to their receipt.

*Total of lead times to receive all materials and components ÷*

*Number of orders for materials and components =*

 *Supplier Leadtime*

### Takt Time

The rate at which a product must be completed to perfectly match customer demand for the product.

*Working time available for the period ÷ Customer demand for the period =*

*Takt Time*

1. Occupational Safety and Health Administration. [↑](#footnote-ref-1)