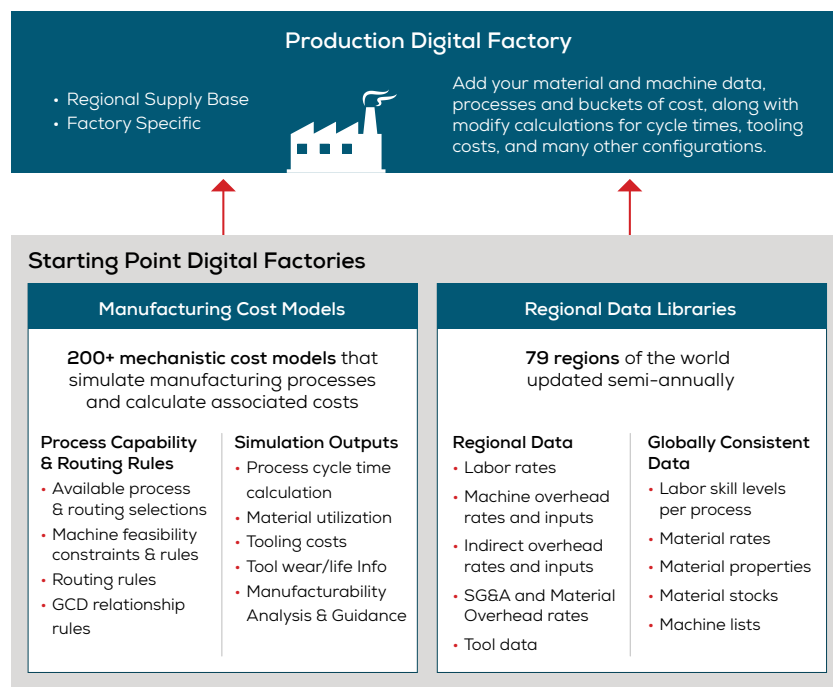# aPriori

Starting Point Digital Factories

GENERAL INFORMATION

Starting point digital factories are a combination of two elements, aPriori Regional Data Libraries and aPriori Manufacturing Cost Models. As the name implies, starting point digital factories are the baseline configuration for a production deployment. They provide benchmark estimates and manufacturing guidance. The analyses produced are based on general and reasonable manufacturing practices and average rates not specific to an individual industry. aPriori recommends that you assess your company's needs e.g., components, processes used to make these components, use cases, and availability of

data to determine configuration requirements for your production digital factories. In some cases our customers may use the starting points with little to no configuration for directional estimates and manufacturability feedback, while other companies configure a digital factory to match the practices and rate structure of their specific manufacturing environment or a specific factory. aPriori's Customer Success Organization is available to support scoping, configuring and refining digital factories.

For further details on Regional Data Libraries and Manufacturing Cost Models, please refer to those specific data sheets.

Production Digital Factories – A Look Inside

Production Digital Factory

- Regional Supply Base
- Factory Specific

Add your material and machine data, processes and buckets of cost, along with modify calculations for cycle times, tooling costs, and many other configurations.

Starting Point Digital Factories

Manufacturing Cost Models

200+ mechanistic cost models that simulate manufacturing processes and calculate associated costs

Process Capability & Routing Rules
- Available process & routing selections
- Machine feasibility constraints & rules
- Routing rules
- GCD relationship rules

Simulation Outputs
- Process cycle time calculation
- Material utilization
- Tooling costs
- Tool wear/life Info
- Manufacturability Analysis & Guidance

Regional Data Libraries

79 regions of the world updated semi-annually

Regional Data
- Labor rates
- Machine overhead rates and inputs
- Indirect overhead rates and inputs
- SG&A and Material Overhead rates
- Tool data

Globally Consistent Data
- Labor skill levels per process
- Material rates
- Material properties
- Material stocks
- Machine lists

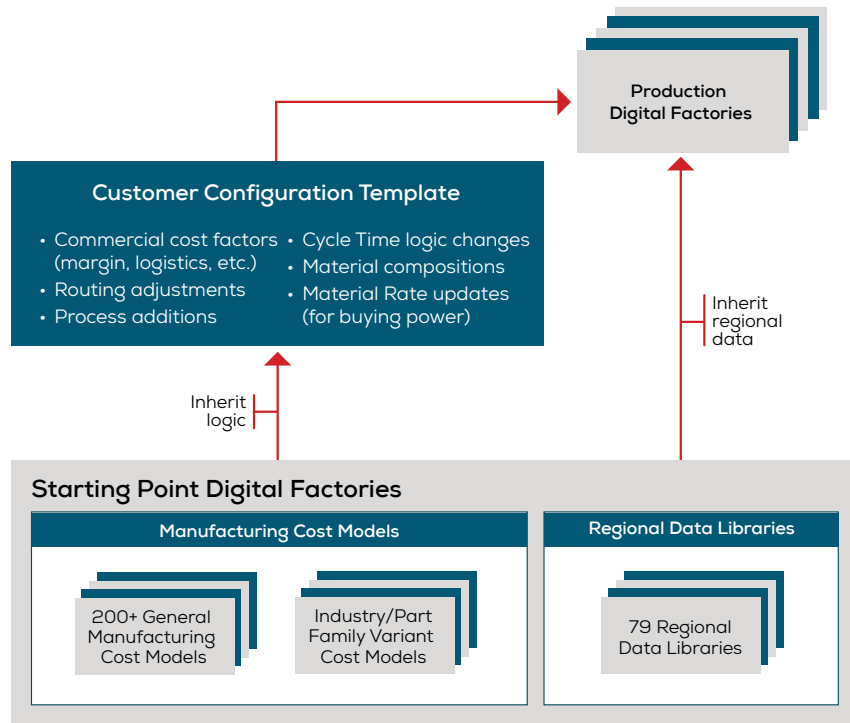# USING STARTING POINT DIGITAL FACTORIES

The diagram below depicts how starting point digital factories are generally utilized within customer deployments. Customer Confirmation Template factories are used to centralize logic configurations and are not exposed to end users for costing. Specific implementations may have multiple templates to accommodate for various requirements. aPriori recommends implementing access control rules to limit end user access to production digital factories, while allowing system administrators and Cost Model Workbench users additional access to template and starting point factories.

The production configuration template digital factories inherit process and accounting logic from Manufacturing Cost Models, ensuring that all future updates published by aPriori for non-configured processes can be easily integrated into customer environments. Within configuration template digital factories, customers generally perform

configurations that are applicable across their business; those configurations typically include modifying commercial cost factors such as margin, adding material compositions, adding and removing processes, adjusting routings, modifying processes to account for different manufacturing methods, and other modifications along these lines.

Production digital factories typically inherit data from Regional Data Libraries and logic from configuration template digital factories. Production digital factories can also contain configurations specific to the facility or region that they represent. These configurations can typically include process and cost logic, along with data such as specific machines, labor rates, overhead rates, and any of the other variables that are available in a digital factory. All configurations depend on your company's use cases, expectations, access to data, access to subject matter experts, required level of automation and other factors; please talk to your aPriori account team about the digital factory configuration and deployment strategy that will work best for your business needs.

Production Digital Factories

Production Digital Factories

Customer Configuration Template
- Commercial cost factors (margin, logistics, etc.)
- Routing adjustments
- Process additions
- Cycle Time logic changes
- Material compositions
- Material Rate updates (for buying power)

Inherit regional data

Inherit logic

Starting Point Digital Factories

Manufacturing Cost Models
- 200+ General Manufacturing Cost Models
- Industry/Part Family Variant Cost Models

Regional Data Libraries
- 79 Regional Data Libraries

MANUFACTURABILITY OUTPUTS

- Manufacturing process routing to make the part

- Cycle time time per process and operation

- Labor time to make a part

- Potential manufacturing issues

- Material utilization

- Information about aspects of a part that are time consuming or expensive to make, e.g., tolerances driving machining or specialized finishing operations

COST OUTPUTS

Starting point digital factories are built to calculate the following outputs:

- **Material:** Direct material used to make the component

- **Labor:** Direct labor used to make, test and assemble the component (includes insurance, workers comp, taxes, benefits)

- **Direct Overhead:** Machine depreciation, machine maintenance, imputed interest and energy to power machines

- **Batch Setup:** The cost to set up the workcenter for the production run (amortized over the number of parts that are made in the batch)

- **Other Direct Costs:** Other expenses attributed to the component, including:

  - » **Material Overhead:** Additional cost attributed to purchasing, receiving, handling, storing, and delivering materials used in production.

  - » **Expendable Tooling:** The cost of expendable tools used in the manufacture of a component e.g., sand in sand casting and inserts (e.g., drill bits) for insert machines (e.g., drills, mills)

- **Indirect Overhead:** Facility Costs and Support Services

- **SG&A:** Sales, General & Administrative expenses

- **Capital Investments:** One time investment costs required to make the component. Calculated as single costs and amortized across the lifespan of the component.

  - » **Hard Tooling:** Cost of hard tools that are needed to manufacture a specific design.

  - » **Fixtures:** Cost of devices that hold a specific part or assembly in the correct orientation on a machine during manufacture or assembly.

  - » **Programming:** Cost of creating a computer program that Computer Numerical Control machines will follow to make or assemble parts of a specific design.

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