# THINGWORX CONNECTED WORK CELL

# ThingWorx CWC Application:

Enable manufacturers to deliver up to date, digital, and incontext information to operators on the shop floor. Combining data from multiple production sources to provide operators a seamless bi-directional interaction with all data required to perform daily work.

# **CWC** delivers:

- √ Authoring Multiple step types and versioning
- √ Supports Fabrication and Assembly Manufacturing
- √ Work Order Scheduling
- √ Operator Executing and Step by Step Tracking
- √ Smart Tool Configuration
- √ Station Dashboard Display
- √ File Storage and Document Management

CWC provides manufacturers and their operators a single source to create, store and execute version-controlled digital work instructions. The authoring process is easy to use, includes multiple step types, and is compatible with smart tools. This method of digital work instruction eliminates gaps in shop floor knowledge, increasing uptime and availability.

# **The Problem**

For manufacturers with complex discrete products, work instruction simplicity and consistency are critical for optimal performance, but it's often very

challenging to isolate the correct instruction from the variety of possibilities: ERP, MES, paper, PDFs, etc.

This disconnect between instruction sources increase the training burden and causes operators to waste time switching between systems seeking the right information.

# The PTC Approach

### **Building an IoT Environment**

CWC is built on top of the ThingWorx platform. ThingWorx serves as the IoT hub for CWC, allowing you to pull in data from several data sources, such as Kepware, Windchill, and smart tools.

## **Enterprise Architecture Readiness**

CWC is encompassed in a larger framework of factory applications. The framework model enables you to easily and consistently roll-out to additional sites, and naturally expand your applications portfolio to include other use cases, such as Real-Time Production and Performance Monitoring (RTPPM) and Asset Monitoring and Utilization (AMU).

### **Enterprise Scale**

CWC is architected to roll out quickly to multiple sites across multiple geographies, eliminating the need for a pilot project. This deployment capability gives CWC an accelerated time to value, as short as 6 months on the first implementation.

With flexible hosting options from on-premise to PTC Microsoft Azure Cloud instances, CWC can be easily deployed and expanded to match your manufacturing process. The deployment process is architected by manufacturing experts, whose experience and shop floor knowledge have made the process easily repeatable for fast implementation.

## **Low Cost of Entry**

Subscription model removes excessive capital requirements that often hinder activating on similar manufacturing initiatives.

#### **Reduced Total Cost of Ownership**

CWC comes with a commitment to updates and enhancements. CWC will be constantly improving with feedback from the field. New functionality consistently rolling out with all functional enhancements available at no additional cost.

### **Rapid Impact**

CWC delivers noticeable improvements on a much shorter timetable by using a standardized implementation approach, furthered by flexible hosting options for rapid deployments. CWC ensures prescriptive offerings of high value, with a no-regret use case.

## Realizing the Value of your investment

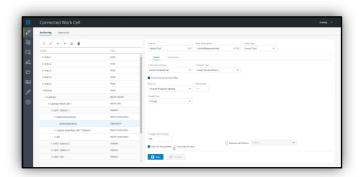
PTC offers a low risk, fast, standardized implementation for CWC. Whether on premise or in the Cloud to realize the business benefit sooner.

## CWC Value

Deliver up to date, digital, and in-context information to operators on the shop floor. CWC's lite authoring will ensure that all work instructions are versioned and approved by authors, meaning no operator will have expired instructions.

Combine data from **multiple production sources**, such as ERP and MES systems, smart tools, and instructions authored within CWC.

Provide operators with **a seamless bi-directional interaction** with all data required to perform daily work



# Fabrication and Assembly

CWC's Fabrication tool set targets lot-based production and production of raw materials. Authors create reference material and log sheets for operators to review and enter data. Operators are free to complete steps in any order.

CWC's Assembly tool set targets **serialized production of finished goods**. This set includes work instruction authoring, route management, and work order scheduling. Authors create **time based step-by-step instructions** for operators to execute on scheduled work orders to complete serialized products.

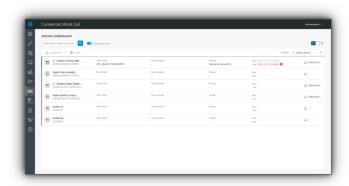
Fabrication and Assembly are both contained in CWC and can be **used in tandem**. Use Fabrication tools to create a raw material. This raw material is then used in Bill of Material for Assembly execution to build the final, serialized product.

# CWC Out of the Box

- Multipe Assembly Authoring Step Types
  - ✓ Instructional
  - √ Verification
  - ✓ List
  - ✓ Manual Entry
  - ✓ Smart Tool
  - ✓ Parts Verification
  - ✓ Calculation
- Fabrication Authoring
  - ✓ Create or import reference documents
  - Dynamic document values updated based on station and product
  - ✓ Set up log sheets for operators to enter manually collected measurements
- Approvals and Versioning
  - ✓ Single Approval Level for Work Instructions
  - ✓ Up to Level 2 Approval for Documentation and Log Sheets
  - ✓ Versioning for Work Instructions, Documents, Log Sheets, and Files
- Route Management
  - Connect work instructions that straddle stations
  - ✓ Accommodate variations in steps based on products
  - ✓ Assign production points
  - ✓ Enable auto-advancina
- Work Order Scheduling
  - ✓ Capable to come from external systems
  - ✓ Filtering on status
- Operator Executing and Step by Step Tracking



- Smart Tool Configuration
  - Provide name, location, picture, and properties
  - ✓ Link through KepServer
  - ✓ Link Documentation for the tool
- Stations Dashboard Display
  - ✓ Display status of each station
  - ✓ Operator log records
  - ✓ Current work order



- File Storage and Document Management
  - ✓ Complete history of documents
  - ✓ Linked to work instruction version
  - ✓ Use document metadata for performance
- Reporting
  - ✓ Performance Reports to compare ideal vs actual operator cycle time
  - ✓ Drill down to compare individual steps
  - Export data into .CSV files for additional analysis

# Technical Requirements

Software Component	Version	Provider
ThingWorx CWC	Latest available at time of contract execution	PTC
ThingWorx	8.5.7, 9.3.1	PTC
Kepware	6.8	PTC
SQL Server	2016 or later	Microsoft

# Guardrails and Technical Limitations

Category	Limitation
Number of Work Units	Up to 50 Work Units can be connected to CWC. More than 50 can be connected, but you may notice a decrease in performance.
Number of Connected Smart Tools	Up to 200 smart tools can be connected to CWC. More than 200 can be connected, but you may notice a decrease in performance.



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