

# **ITC INFOTECH'S**

## **CAD Design Automation and Validation Tool**



**Powered by Knowledge-Based Product Design Automation (KPDA)**

## Are you facing these engineering quality challenges?



Are manual CAD validations delaying your design-to-release cycle?



Are inconsistencies in modelling and drawing standards causing frequent rework?



Do native CAD tools fall short of automating your unique design rules or logic?



Is the absence of integrated, scalable design validation increasing time and costs?



Are your teams duplicating effort due to limited reuse of design knowledge?

## Solution Overview

ITC Infotech's **CAD Design Automation and Validation Solution**, enabled by **Knowledge-Based Product Design Automation** capabilities, delivers an end-to-end platform for design automated drawing/model generation and validation.

Combining rule-driven automation with integrated quality checks, the tool leverages **Knowledge-Based Engineering** to streamline engineering processes across industry verticals — automotive, discrete manufacturing, industrial manufacturing, and more.

Built on a **scalable, web-based architecture**, the solution interfaces with CAD and PLM systems like **Creo, Windchill, KOLA, and Autodesk Vault**, enabling organizations to automate and control their product design lifecycle—from design creation to quality assurance and compliance.

## Key Capabilities of the Solution



### Knowledge Capture & Representation:

Codifies engineering design rules, standards, best practices, and constraints into structured logic (rules, formulas, matrices).



### Parametric Modelling & Design Automation

Automates design creation using parametric templates, generating variants by adjusting input parameters based on pre-set rules.



### Design Space Exploration & Optimization

Supports evaluation of multiple design options using rule-driven logic and integrated optimization engines.



### CAD & CAE Integration

Connects seamlessly with CAD/CAE systems to enable closed-loop automation from design generation to analysis and validation.



### Knowledge Reuse & Standardization

Promotes reuse of validated logic across product lines, improving consistency and reducing redundant engineering effort.



### Collaboration & Knowledge Sharing

Centralized access to design logic and results enhances collaboration and encourages best-practice adoption across teams.

## Key Features of the Solution



### Design & Drawing Automation

Auto-generates 3D/2D outputs using configurable input forms, templates, and business rules based on product or geography.



### Web-Based Architecture with SSO

Secure, responsive interface with role-based access and Active Directory integration for user authentication.



### Automated Quality Validation

Validates models against design standards, drawing rules, metadata, and compliance norms.



### FIFO-Based Request Handling

Ensures fair and efficient task execution for concurrent users through First-In-First-Out logic.



### Optimized License Utilization

Uses a single backend CAD license to serve multiple validation or design requests on-demand.



### Real-Time Reporting & Notifications

Delivers validation outcomes and reports to users automatically via email and web interface.

## Business Benefits

### Reduced Design Cycle Time:

Faster model and drawing creation through automation of repetitive, rule-driven tasks.

### Lower Development Costs:

Reduced rework, fewer design iterations, and better resource utilization.

### Improved Product Quality:

Validated design logic ensures every drawing meets organizational and regulatory standards.

### Enhanced Design Adaptability:

Enables parameter-driven modifications to create product variants efficiently, minimizing the need for manual redesign and rework.

### Enhanced Collaboration:

Centralized logic repository and automation tools enable consistent engineering practices across teams.

## Representative Use Cases

### Quality Validation of 3D Models and Assemblies

Ensure compliance with internal and industry standards across all product lines.

### Rule-Based CAD Generation

Drive consistent design creation using predefined business logic for any domain mechanical, electrical, civil, or architectural.

### Windchill & PLM-Driven Workflows

Retrieve metadata and CAD objects directly from PLM systems and sync outputs to the enterprise repository.

### Remote CAD Processing for Backend Automation

Trigger Creo or other sessions on remote servers for validation or generation tasks—without user intervention.

### Audit-Friendly Reports

Generate structured reports to support internal reviews, supplier deliverables, or regulatory compliance needs.

# Case Studies

## 1. CAD Design Automation for Leading Road Signage Structure Manufacturer from US



### Business Challenge

The client relied heavily on manual CAD processes for designing complex road signage assemblies, leading to slow design cycles, frequent errors, and limited scalability across product variants.



### Solution

We implemented an automated CAD design and drawing generation solution, featuring a rule-based configuration interface and backend logic to create 3D models, 2D drawings, and BOMs with minimal manual input, integrated with ERP systems.



### Business Benefits

The solution reduced design time from hours to minutes, improved accuracy, lowered development costs, and enabled efficient management of a broader product portfolio through scalable automation.

## 2. CAD Design Automation for Leading Elevator Manufacturer from EU



### Business Challenge

Manual efforts to generate 2D drawings and manage configuration-specific templates resulted in inefficiencies, inconsistent output, and higher design turnaround time.



### Solution

We delivered a CAD automation platform using Creo Pro/Program, integrated with a web interface to load configurations, trigger drawing generation, and apply standardized templates with embedded validation logic.



### Business Benefits

The approach significantly improved engineering productivity, enhanced accuracy, reduced operational costs, and enabled fast scaling of design processes across varied elevator configurations.

## 3. CAD Quality Check Automation for a Global Commercial Vehicle Manufacturer



### Business Challenge

Following the loss of a legacy checker tool, the client faced challenges in manually validating CAD data against over 200 modelling and compliance checkpoints, leading to inefficiencies and quality risks.



### Solution

We developed a web-based quality check solution with backend automation, integrated with CAD and PLM systems. The architecture supported phased implementation, starting with high-priority Creo checkpoints, and minimized license dependency.



### Business Benefits

The solution automated CAD validation, reduced manual effort, improved design compliance, lowered operational costs, and laid a scalable foundation for full checkpoint coverage in future phases.

## ITC Infotech

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