

Part Smart

Innovation Studio – an integrated product-education & creative-technology platform

As director of MPA's Innovation Studio, I built Part Smart into an interconnected creative-technology system for Motorcar Parts of America. Product knowledge entered through a four-camera broadcast studio and enterprise media pipeline, was transformed into searchable media and digital installation instructions, distributed through Part Smart and e-commerce experiences, and then extended into automation, retrieval/RAG, interactive 3D, and world-model research. The stack spanned React front ends, a Blackmagic-Quantum-CatDV media backbone, Python/Photoshop production automation, WebGL and AR/VR experiences, and AI knowledge tooling – with Install Assist alone documenting more than half a million dollars in savings by replacing printed in-box instructions.

\$500K+	300+	50+	4-cam
DOCUMENTED SAVINGS	INSTALL & TRAINING VIDEOS	LANDING PAGES AT SCALE	BROADCAST STUDIO + 2 BAYS

— SHIPPED & OPERATIONAL

Install Assist SHIPPED • \$500K+

React installation-support site that replaced in-box printed instructions, delivered via product pages and QR access. *React/Netlify*.

Part Smart Academy OPERATIONAL

Product-education platform & content brand linking installation knowledge, technical video and support across Quality-Built, Pure Energy and other MPA brands.

Part Smart QR Learning System SHIPPED

QR layer connecting physical products and packaging to instructions, video and troubleshooting; the access layer for Install Assist.

MAM Media Pipeline DEPLOYED

Enterprise ingest, catalog, metadata, storage, archive & reuse for the Innovation Broadcast Studio. *Blackmagic · Quantum StorNext · CatDV*.

Automated Broadcast & Metadata Ingest DEPLOYED

Moved multicamera footage from a 4-camera / 2-bay stage into central storage with production and product metadata for reuse.

CatDV · Akomi · Quantum Integration OPERATIONAL

Media-management, volume, metadata and archive integration; core system operational with staged upgrades under test.

360° Photography Crop Tool SHIPPED

Python + Photoshop automation for cropping, alignment, normalization, sizing and export of large product-image sets.

360° Photo-Robot Pipeline OPERATIONAL

Capture-to-delivery workflow producing consistent product spins – automated photography, processing, naming and web delivery.

AAPEX Interactive Kiosk PRODUCED

Touchscreen product explorer: 8 categories, ~40 hotspots, video, hero cards, specs and 360° spins, with a mirrored overhead display.

WebGL Exploded Views SHIPPED

Browser 3D experiences letting users rotate and explore automotive assemblies and individual components.

Quality-Built E-Commerce SOFT-LAUNCH

Commerce initiative linking products, educational media, Amazon listings and support content for DIY and professional mechanics.

YouTube-to-Commerce Pipeline OPERATIONAL

Repurposed installation content into 300+ videos and Shorts driving audience growth, SEO, warranty reduction and e-commerce.

Automated Landing-Page Production SHIPPED

System producing 50+ product, installation and campaign pages for MPA and accounts incl. AutoZone, Advance, O'Reilly and Parts Authority.

Automated Short-Form Repurposing OPERATIONAL

Converts long-form footage from the MAM archive into Shorts, posts, thumbnails and repeatable campaign assets.

— PROTOTYPES & KNOWLEDGE SYSTEMS

Part Smart Knowledgebase INTERNAL

Structured repository of installation procedures, technical knowledge and training media – the foundation for later retrieval and RAG work.

MPA Video Knowledge Database PROTOTYPE

ML-enabled search, classification and retrieval across technical video, transcripts, metadata and product information.

Internal RAG Foundation PROTOTYPE

Retrieval-augmented system over product docs, installation content and video metadata for support, search, reuse and training.

Internal Marketing Workflow Apps INTERNAL

Small web apps and automations for recurring production tasks. *React, Python, APIs, Replit, Windsurf, Cursor, Bolt.*

Part Smart QuickStart PROTOTYPE

Simplified onboarding app to help customers quickly locate the correct instructions and learning content.

Starter Quiz & Video Kiosk PROTOTYPE

Earlier interactive kiosk teaching starter-system knowledge through video questions and quiz navigation.

Digital Storyboarding Tool INTERNAL

Internal app for planning installation videos, shot coverage and multimedia productions against technical requirements.

Remanufacturing Documentation COMPLETED

First cradle-to-grave record of MPA's remanufacturing and triple-testing QC process – a reusable base for training and future AI systems.

— PILOTS & CONCEPTS

VR/XR Installation Experiences PROTOTYPE

Immersive spatial environments for exploring products and installation procedures.

AR Product Bulletin CONCEPT

AR technical experience connecting physical products and print to interactive content.

AR Trade-Show Catalog CONCEPT

AR catalog for product information, media and interactive 3D assets at shows.

Predictive-Analysis Web App PROTOTYPE

Surfaces trends, patterns and possible outcomes from structured product and business data.

Cloud/Hybrid MAM Architecture EVALUATED

Proposed Quantum/CatDV modernization with hybrid + S3 archive, searchable metadata and remote access.

AI Transcription POC POC

Transcription layer to make spoken technical information in the video archive searchable for KB/RAG tools.

3D Scanning Pipeline EXPERIMENTAL

Photogrammetry, RealityScan and FARO-arm experiments to digitize components for catalogs, AR/VR and simulation.

Generative-AI Adoption Program INTERNAL

Introduced generative AI and AI coding across marketing and production – ChatGPT Enterprise, gen-image and AI-assisted coding.

Photoshop Generative-AI Experiments EXPERIMENTAL

Beta and generative features for product-image augmentation, cleanup and production acceleration.

— ADJACENT R&D – INDEPENDENT WORLD-MODEL RESEARCH

Overlaps the MPA automotive domain but is my independent Cognitive Space/World-Model research – included for context, not as MPA-owned work.

12-Volt Charging-System Digital Twin

Relational simulation of alternator, regulator, battery and loads to detect relational faults rather than isolated failures.

JEPA Automotive Fault Model

Temporal encoder, latent predictor and EMA target for learning normal behavior and detecting anomalies.

World-Model Simulation Engine

Three.js + Blender synthetic environments for agent learning, prediction and causal reasoning.

Dreamer/JEPA Training Pipeline

Connects synthetic environments with latent world-model learning.

WorldSpec DSL

Domain-specific language for environments, rules, systems, observations and learning scenarios.

Authored Anomalies System

Injects faults into simulations so intelligent systems learn causal relationships.

ALL AI Automotive Pipeline

Four-stage architecture: corpus → retrieval → learning → world model.

Automotive World-Model Ecosystem Map

Interactive D3 visualization linking USD, digital twins, JEPA, simulation, robotics and CG.

The through-line – *not marketing content, but an AI-driven creative-technology system. I captured MPA's product knowledge in the studio, transformed it into searchable media and digital instructions, then built the intelligence layer on top: retrieval/RAG knowledgebases, an ML-powered video-search database, generative-AI production pipelines, predictive applications, and automotive digital-twin and world-model artifacts – hands-on AI expertise applied end to end, from corpus to learned model.*