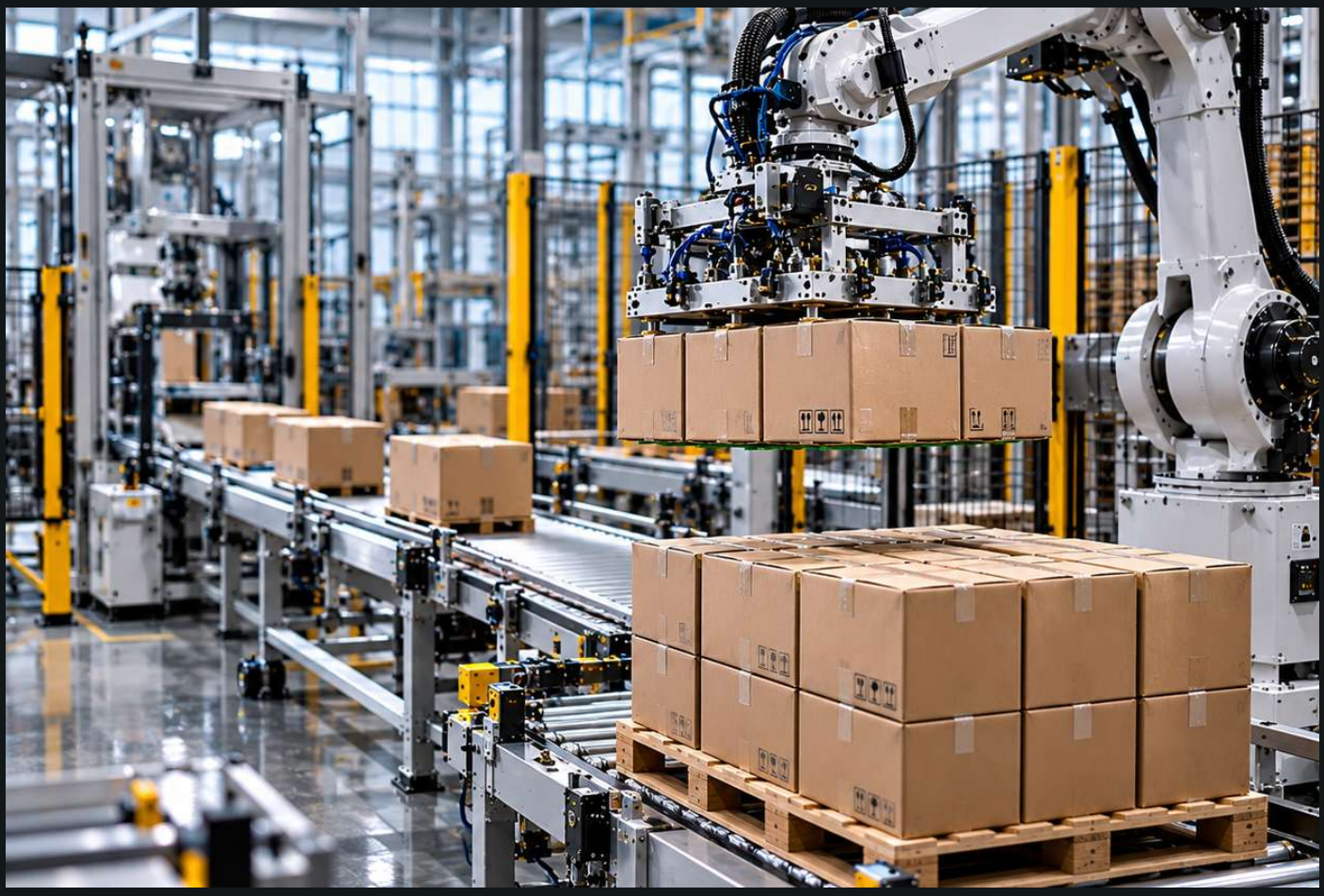
# Engineering systems that work.

Industrial Automation • Robotics • Engineering



DCAC Robotics (Pty) Ltd | South Africa

# Engineering That Works

**INDUSTRIAL AUTOMATION • ROBOTICS • ENGINEERING**

DCAC Robotics is a South African engineering company specialising in industrial automation, robotics, custom machinery, and systems integration.

Built on more than two decades of hands-on engineering experience, DCAC Robotics approaches automation from a simple principle:

Understand the problem first. Engineer the technology around it.

Our experience spans PLC and HMI development, industrial robotics, motion control, electrical control systems, custom machinery, robotic end-of-arm tooling, process automation, machine upgrades, and commissioning.

But successful automation rarely belongs to only one engineering discipline.

Mechanical design affects controls.

Controls affect motion.

Motion affects production.

And every decision ultimately affects the people who operate and maintain the equipment.

For that reason, DCAC Robotics approaches projects as complete engineering systems, considering how the mechanical, electrical, controls and software elements must work together to solve the customer's actual production requirement.

Our work ranges from upgrading existing machinery and modernising legacy control systems to developing custom automation equipment and specialised robotic tooling.

Whether improving an existing production process or developing something entirely new, the objective remains the same:

Build practical engineering solutions that work in the real world.

| 20+ YEARS | MULTI-DISCIPLINE | END-TO-END | INDUSTRIAL |
|---|---|---|---|
| Engineering Experience | Mechanical • Electrical<br>Controls • Robotics | Design • Build<br>Program • Commission | Built for Real<br>Production Environments |

# What We Do

## 01 Industrial Automation & Controls

PLC and HMI development, process automation, motion control, and machine control for new and existing industrial systems.

Siemens PLC & HMI • Control-system design • Machine sequencing • Servo & motion control • VSD integration • Process control • Fault finding & optimisation.

## 02 Robotics & End-of-Arm Tooling

Robot programming and application-specific tooling for material handling, palletising, machine tending and specialised automation applications.

Yaskawa and Kawasaki Industrial robot programming • Palletizing • Material handling • Custom grippers & EOAT • Pneumatics • Vacuum handling

## 03 Custom Machinery & Systems Integration

Purpose-built equipment and modifications designed around real production requirements—from individual mechanisms to integrated automation systems.

Special-purpose machinery • Conveyor systems • Gantries • Mechanical automation • Pneumatic systems • Machine integration • Production-line modifications

## 04 Machine Rebuilds & Modernisation

Extending the useful life and capability of existing equipment through mechanical, electrical and controls re-engineering.

PLC migrations • Controls upgrades • Machine rebuilds • Product-format conversions • Obsolescence upgrades • Servo retrofits • Existing equipment integration.

## 05 SCADA, Vision & Connected Systems

Connecting machines and production processes to higher-level monitoring, data, and vision systems.

Ignition SCADA • OPC UA • Industrial communications • Machine vision • Camera-based positioning • Data acquisition • PLC/SCADA integration

## 06 Contract Engineering & Commissioning

Flexible engineering support for manufacturers, OEMs and systems integrators requiring additional specialist capability during design, development, or site execution.

Controls engineering • PLC/HMI development • Robot programming • System integration • FAT/SIT support • Commissioning • Troubleshooting • Site support • Integrated Testing

# From Problem to Production

## Engineering starts with understanding the problem.

Every automation project is different.

Sometimes the requirement is a completely new machine. Sometimes an existing system needs to produce something for which it was never designed. Sometimes the mechanical equipment is perfectly serviceable, but the controls are obsolete. And sometimes a single point of failure is costing production time.

DCAC Robotics approaches each project by first understanding what the process needs to achieve.

From there, the right combination of mechanical, electrical, controls and software engineering can be developed around the application.

### 01 / UNDERSTAND

**Start with the process, not the technology.**

Process assessment • Requirements • Existing equipment • Constraints • Technical feasibility

### 02 / ENGINEER

**Turn the requirement into a practical solution.**

Concept development • System architecture • Mechanical design • Controls strategy • Component selection

### 03 / BUILD

**Turn the engineering into hardware.**

Fabrication • Control panels • Machine assembly • EOAT • Pneumatics • Electrical integration

### 04 / PROGRAM

**Give the system its behaviour.**

PLC • HMI • Motion • Robotics • Process sequencing • SCADA interfaces

### 05 / COMMISSION

**Prove it in the real world.**

Testing • FAT • Installation • Start-up • Commissioning • Optimisation

### 06 / SUPPORT

**Engineering does not necessarily end at handover.**

Fault finding • Upgrades • Modifications • Production support • Engineering assistance

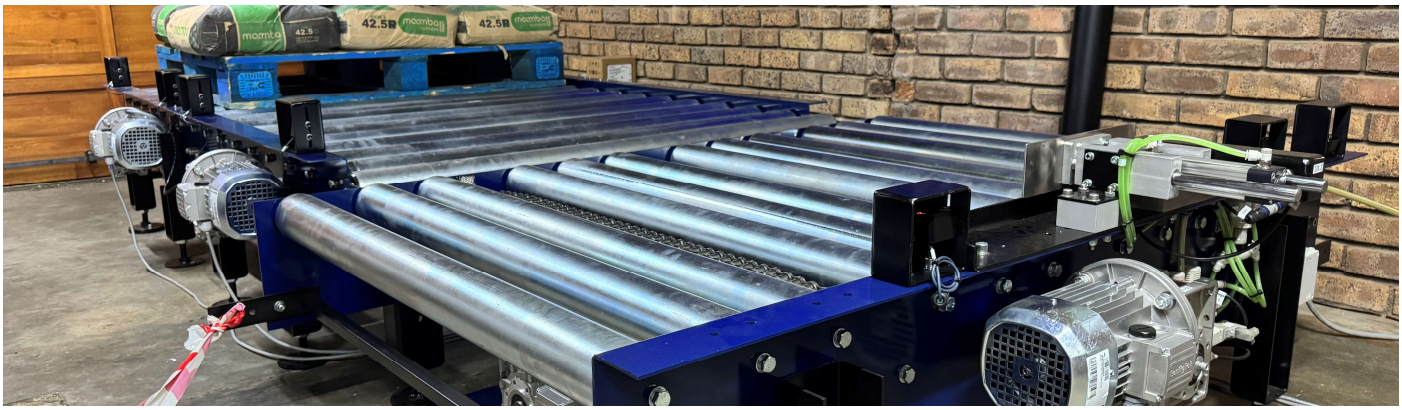
Every project does not need every stage.

DCAC Robotics can deliver a complete automation solution or provide specialist engineering support for an individual part of a larger project.

# Automated Pallet Bypass System

**KEEPING PRODUCTION MOVING**

## When downstream equipment became a single point of failure, DCAC Robotics engineered another path.



**3.0 TONNES**
Lifting Capacity

**SIEMENS S7-1500**
Control Platform

**PNEUMATIC**
Lift System

**AUTOMATIC**
Bypass Control

### CHALLENGE

An existing robotic palletising system transferred completed pallets through an automated stretch-wrapping machine.

Whenever the stretch wrapper experienced a breakdown or became unavailable, the entire palletising line was forced to stop.

DCAC Robotics was tasked with developing a retrofit solution allowing palletising to continue during stretch-wrapper downtime.

### SOLUTION

DCAC Robotics designed, manufactured, and integrated a heavy-duty automatic pallet bypass system.

When the stretch wrapper becomes unavailable, the system diverts the completed pallet from the normal production route.

The pallet is pneumatically lifted and transferred onto a perpendicular conveyor system where operators can manually remove it and transport it to alternative stretch-wrapping equipment.

This allows the upstream palletising operation to continue while the downstream issue is addressed.

### DCAC ROBOTICS SCOPE

- Mechanical design
- Fabrication
- Heavy-duty pallet conveying
- Pneumatic lifting system
- Siemens S7-1500 controls additions
- Automatic bypass sequencing
- Integration with existing palletising system

### RESULT

A stretch-wrapper breakdown no longer requires the upstream palletising process to stop.

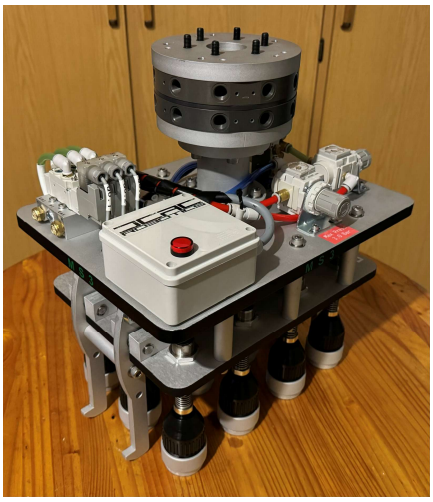
The bypass provides an alternative material-flow route, allowing production to continue while the downstream equipment is addressed.

**Instead of accepting the downstream machine as a single point of failure, we engineered another path.**

# Multi-Function Robotic Bottle & Crate Gripper

**ONE TOOL. MULTIPLE OPERATIONS.**

**A single robotic end-of-arm tool designed to manage both individual wine bottles and complete crates.**



## CHALLENGE

The application required the automation of a process involving both empty and full wine bottles and their transport crates.

A crate containing empty bottles would be presented to the robotic system. The process required the robot to manage the crate, remove the empty bottles, load full bottles back into the crate and subsequently manage the complete crate.

This created an unusual tooling challenge:

The same robot needed to manipulate two very different loads — individual bottles and complete crates.

Using separate tools would add complexity to the robotic system and potentially require a tool-changing arrangement.

| 1 EOAT | BOTTLES + CRATES | PNEUMATIC GRIPPING | PNEUMATIC |
|---|---|---|---|
| Multiple Operations | Dual Handling | Bottle Handling | Crate Handling |

## SOLUTION

DCAC Robotics designed and manufactured a custom multi-function robotic gripper capable of performing both operations with a single end-of-arm tool.

**Bottle Handling**

Pneumatic-based bottle grippers allow the robot to pick and place individual bottles during the unpacking and packing operations.

**Crate Handling**

A separate integrated gripping mechanism allows the same tool to pick and transfer the complete crate.

**Integrated Pneumatics**

Pneumatic components are incorporated directly into the EOAT, creating a purpose-built tool around the requirements of the application.

The result is one gripper capable of supporting the different handling operations without requiring the robot to exchange tooling.

## DCAC ROBOTICS SCOPE

DCAC Robotics was responsible specifically for the design and manufacture of the robotic gripper.

Scope included:

Application-specific EOAT concept • Mechanical gripper design • Bottle-handling mechanism • Crate-handling mechanism • Pneumatic component integration • Component selection • Manufacture and assembly • Functional testing

## RESULT

The custom EOAT enables a single robot tool to perform both the bottle and crate handling operations required by the application.

By integrating both functions into one purpose-built gripper, the application avoids the need for separate end-of-arm tools or an additional tool-changing operation.

**Sometimes the smartest robotic solution is not another robot. It is a better tool for the robot you already have.**

# CIP Controls Modernisation

**MODERN CONTROLS. PROVEN PROCESS.**

**Modernising a critical production system without replacing process equipment that was still doing its job.**



## CHALLENGE

The existing Clean-in-Place system supports critical cleaning operations across the processing plant, including silos, product lines, and tanker cleaning.

The process equipment itself remained serviceable, but the existing control system was based on a Delta PLC, while other processing equipment within the plant had moved toward a Siemens control standard.

The objective was therefore not to replace the CIP system.

It was to modernise its controls while retaining the existing process equipment and align the system with the plant's Siemens automation environment.

The upgraded system also needed to be prepared for integration with the plant's existing Ignition SCADA system.

## SOLUTION

DCAC Robotics developed a new control solution around the Siemens S7-1500 platform.

The existing tanks, valves and field equipment were retained while the control architecture, electrical panel and PLC software were redeveloped around the existing CIP process.

DCAC Robotics designed and manufactured the new control panel, developed the PLC application, installed the system on site, and commissioned the upgraded controls against the existing plant equipment.

The architecture was also prepared for subsequent interface with the plant's existing Ignition SCADA environment.

| DELTA → S7-1500 | SIEMENS | EXISTING EQUIPMENT | IGNITION |
|---|---|---|---|
| Controls Migration | Plant Standardisation | Retained | SCADA Interface Ready |

## DCAC ROBOTICS SCOPE

Existing control-system assessment • Delta-to-Siemens controls migration • Siemens S7-1500 control architecture • Electrical control-panel design • Control-panel manufacture and assembly • PLC software development • CIP sequence control • Integration with existing field equipment • On-site installation • System commissioning • Ignition SCADA interface preparation

## RESULT

The CIP system was migrated to a modern Siemens S7-1500 control platform while retaining the existing tanks, valves, and process equipment.

The upgrade aligns the CIP controls more closely with the automation platform used elsewhere in the plant and provides a foundation for integration with the existing Ignition SCADA environment.

Most importantly, the project modernised the control layer without requiring unnecessary replacement of serviceable process equipment.

**Modernisation does not always mean replacing the equipment. Sometimes the right solution is giving a proven process a better control system.**

# Packaging Machine Re-Engineering

## RE-ENGINEERING FOR A NEW APPLICATION

**An existing packaging machine transformed for a completely different product, pack format, and production sequence.**

## APPLICATION TRANSFORMATION

### ORIGINAL APPLICATION

**200 ml** / Cartons
**2 × 3** / Six-Pack
**TWIN INFEED** / Two Packs / Cycle
**TWIN PUSHER** / Original Configuration

### RE-ENGINEERED APPLICATION

**500 ml** / Bottles
**2 × 5** / Ten-Pack
**SINGLE PACK** / One Pack / Cycle
**SERVO PUSHER** / Re-Engineered Motion

## CHALLENGE

The existing packaging machine had originally been designed for 200 ml cartons, using a twin-infeed arrangement to produce two 2×3, six-packs configuration per machine cycle.

The new production requirements were significantly different.

The machine needed to package 500 ml bottles in a 2×5, ten-pack configuration, producing a single completed pack per cycle.

This was not simply a product-size change.

The new application required changes to the machine's product handling, infeed arrangement, pusher system, and operating sequence.

Rather than replace the machine completely, the opportunity was to determine whether the existing equipment could be successfully re-engineered for its new purpose.

## SOLUTION

DCAC Robotics re-engineered the existing third-party packaging machine around the new bottle and pack format.

The complete infeed section was redesigned and rebuilt to accommodate the larger 500 ml milk bottles and the new 2 × 5 product arrangement.

The previous twin-pusher concept was replaced with a single servo-driven pusher, while the existing Siemens PLC software and machine sequence were redeveloped around the new mechanical configuration and production cycle.

The result was an existing machine given a fundamentally different application through a combination of mechanical redesign, motion control, and PLC software engineering.



## DCAC ROBOTICS SCOPE

Existing machine assessment • Application re-engineering • Complete infeed redesign • Mechanical fabrication and rebuild • Product-handling modifications • Pack-format conversion • Servo pusher reconfiguration • Siemens PLC software modification • Machine sequence redevelopment • Testing and commissioning.

## RESULT

The existing packaging equipment was successfully repurposed for a different production requirement, moving from small cartons and six-pack production to larger bottles and a ten-pack format.

Rather than replacing the entire machine, the project retained usable equipment while re-engineering the areas necessary for the new application.

The project demonstrates how existing industrial machinery can gain a second production life through targeted mechanical, controls, and motion re-engineering.

**Sometimes the best new machine is one you already own.**

# Engineering Supply & Manufacturing Support

**FROM ENGINEERING TO THE PARTS THAT MAKE IT POSSIBLE.**

DCAC Robotics supports industrial projects beyond automation engineering alone.

Through a combination of engineering capability and established manufacturing, supplier, and distributor relationships, DCAC Robotics can assist customers with custom manufactured parts, machine-safety equipment, industrial signage, welding equipment, and electrical and automation components.

This allows customers to source individual components or combine engineering, manufacturing, and equipment supply through a single project partner.

## CUSTOM MANUFACTURED PARTS

Components manufactured from customer drawings, CAD models, or project requirements.

Capabilities include:

CNC-machined components • Laser-cut components • Sheet-metal parts • Custom brackets and mounting plates • Machine components • Fabricated assemblies • Application-specific mechanical parts

Where appropriate, DCAC Robotics can assist with component design and coordinate manufacture, or source components from customer-provided drawings.

## INDUSTRIAL SIGNAGE & IDENTIFICATION

Custom identification and signage for machinery, electrical systems, and industrial environments.

Capabilities include:

Vinyl cutting • Machine identification • Equipment labels • Safety signage • Custom printed signage • Panel and equipment identification.

## MACHINE SAFETY & FENCING

Machine guarding and industrial safety-fencing solutions for automated machinery, robotic systems, and production environments.

Capabilities include:

Industrial safety fencing • Machine guarding • Access doors and gates • Safety enclosures • Integration with automated equipment • Application-specific guarding layouts

DCAC Robotics can source and supply Axelent machine-safety and fencing products through established supplier and distributor relationships.

## WELDING SYSTEMS

Industrial welding equipment and engineering support for manual and automated welding applications.

Capabilities include:

Industrial welding equipment • Robotic welding applications • Welding-system integration • Application-specific welding solutions • Supporting automation and controls.

DCAC Robotics can source and supply Megmeet welding equipment through established supplier and distributor relationships.

## ELECTRICAL & AUTOMATION COMPONENTS

Industrial electrical and automation hardware can be sourced as individual components or supplied as part of a complete DCAC Robotics engineering project.

Typical equipment includes:

PLCs • HMIs • Variable-speed drives • Servo systems • Motors • Sensors • Industrial networking equipment • Control-panel components • Electrical components • Automation hardware

DCAC Robotics can source and supply Siemens automation components and other industrial electrical equipment through established distributor and supplier relationships.

**ONE-OFF COMPONENTS • REPLACEMENT PARTS • PROJECT HARDWARE • CUSTOM MANUFACTURE • INDUSTRIAL EQUIPMENT**

# Contract Engineering & Integration Support

**ENGINEERING CAPACITY. WHEN AND WHERE YOU NEED IT.**

**Specialist automation and controls support for manufacturers, OEMs, and systems integrators — from development through commissioning.**

## ENGINEERING SUPPORT THAT FITS THE PROJECT

Not every project requires another complete systems integrator.

Sometimes what is needed is additional experienced engineering capacity — someone who can step into an existing project, understand the system, work within the established engineering environment, and take responsibility for a defined scope.

DCAC Robotics provides contract engineering and integration support to manufacturers, machine builders, OEMs and systems integrators requiring additional specialist capability during project development, testing, commissioning, or site execution.

Support can be provided for a specific engineering task, a defined project phase, or alongside an existing engineering team.

## WHERE DCAC ROBOTICS CAN SUPPORT

### CONTROLS ENGINEERING

PLC and HMI software development, machine sequencing, controls modifications and troubleshooting.

PLC • HMI • Motion • Drives • Industrial Communications

### ROBOTICS

Additional engineering capacity for industrial robotic applications and commissioning.

Robot Programming • Integration • Palletising • Material Handling • EOAT

### SYSTEM INTEGRATION & TESTING

Support during integration and verification of interconnected automation systems.

FAT • SIT • Interface Testing • Fault Finding • System Validation

### COMMISSIONING & SITE SUPPORT

Hands-on engineering support during installation, start-up, and production ramp-up.

Commissioning • Troubleshooting • Optimisation • Production Support

### MACHINE & CONTROLS MODIFICATIONS

Engineering support for existing equipment requiring changes, upgrades, or redevelopment.

PLC Migrations • Retrofits • Sequence Changes • Motion Upgrades • Machine Modifications

### SPECIALIST PROJECT SUPPORT

Additional engineering capability when internal resources are committed elsewhere or a project requires specific automation expertise.

Defined Scope • Project-Based • On-Site • Engineering Collaboration

## BUILT TO COLLABORATE WITH YOUR TEAM

DCAC Robotics can operate as an independent engineering supplier or as an extension of an existing project team.

When supporting an OEM or systems integrator, the objective is to add capability where it is needed, work within the project's established standards and interfaces, and help move the system toward successful delivery.

**PROJECT DEVELOPMENT → INTEGRATION → TESTING → COMMISSIONING → SITE SUPPORT**

DCAC Robotics can join the project wherever additional engineering capacity is required.

**Your project. Your standards. Additional engineering capacity when you need it.**

# LET'S BUILD SOMETHING THAT WORKS.

Have a production problem, automation requirement or engineering project that needs a practical solution?

Whether you need a complete automation system, an existing machine re-engineered, specialist engineering support or simply the right component manufactured or sourced, start with the problem.

**We will engineer the solution around it.**

## DCAC ROBOTICS (PTY) LTD

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**Understand the problem first. Engineer the technology around it.**