

Action Prowave

Your Global ODM Partner





2010

Founded in Shanghai. Launched a 3G tablet in collaboration with **China Telecom**, highlighted at MWC Barcelona.



2018

Teamed up with **Lenovo** New Vision to develop AR glasses based on Qualcomm platforms. Developed handheld scanner for **Newland**.



2023

Collaborated with **JD.com** to develop a handheld scanner. Initiated research into foldable smartphone technology.



2014

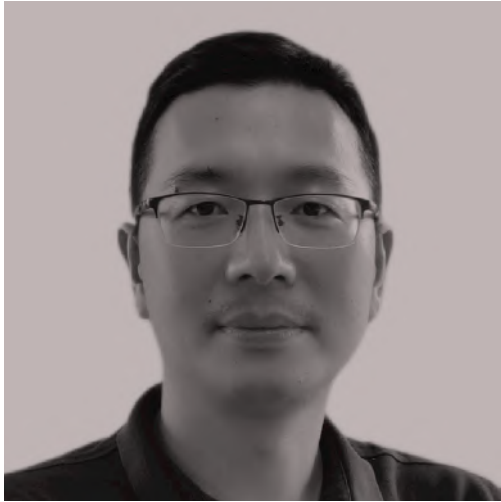
Ventured into the realm of mobile scanning and smart mobile POS. Started a decade long collaboration with **Honeywell**.



2021

Crafted high-precision terminal for the BeiDou navigation system with **CHCNAV**. Handheld scanner esteemed by clients like **JT Express**, **ZTO Express**.

Leadership Team



Zhicong Zhu, ODM GM

Zhicong is a Computer Science graduate from the University of Electronic Science and Technology, and started his career at ZTE Communications. With over 20 years in the communication sector, his expertise in R&D and supply chain management spans from consumer devices to industrial-grade products. At Action, Zhicong is dedicated to crafting products fit for real-world applications.



Richard Yang, CEO

Richard, a Xidian University alumni and guest professor, is a communications industry veteran. He was Huawei's WCDMA chief engineer and holds 16 patents. As Action's founder in 2010 and CEO since, he's built a reputation for ODM solutions, from consumer goods to industrial terminals. Richard is keen to boost Action's offerings with AI and global manufacturing capabilities.

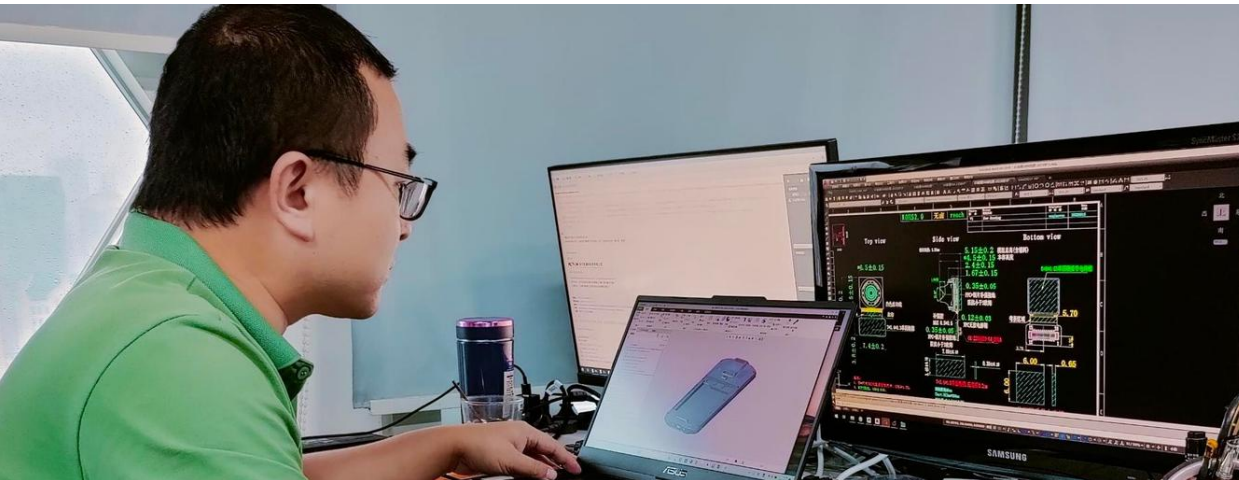
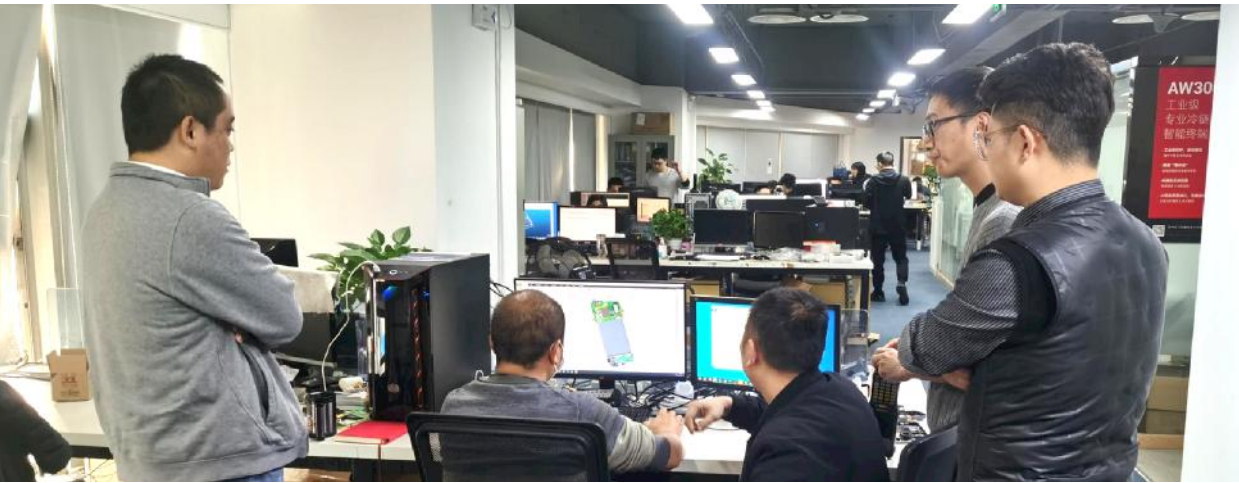


Luna Yang, CTO

Luna made her way to the US to study Robotics with a Master's at Carnegie Mellon University. After rocking it for five years as a machine learning engineer at Aurora Innovation and accoladed by Business Insider as a rising star in self-driving vehicles, she joined her father to take on the next big thing in smart terminals. She spearheads AI algorithms and explores global business avenues.

Hardware Design

At Action, our decade-long journey in hardware design spans everything from mainboard to the entire device.



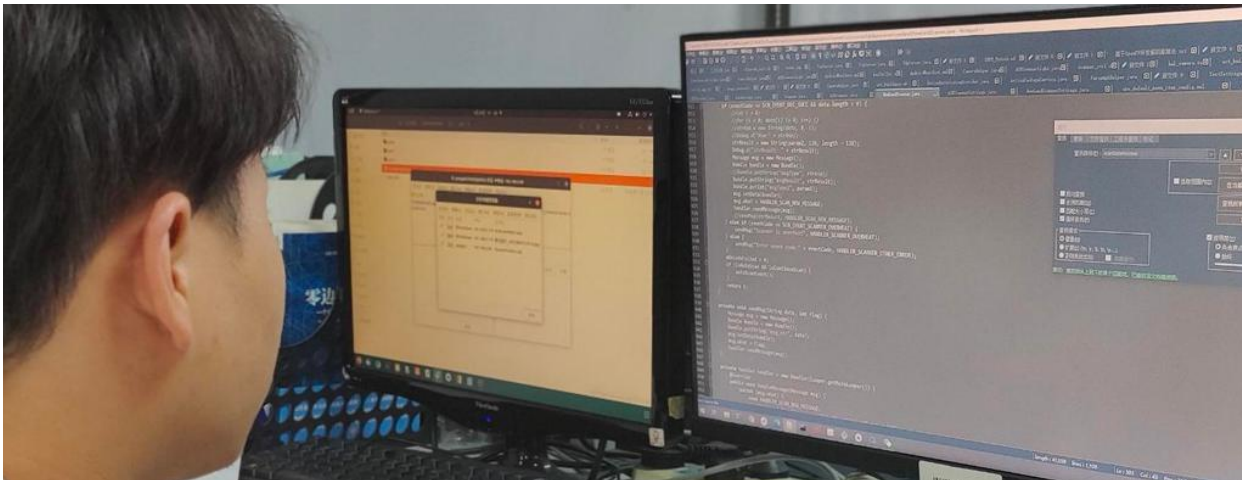
Comprehensive Testing

We ensure the highest quality by coupling each step of development with rigorous testing.



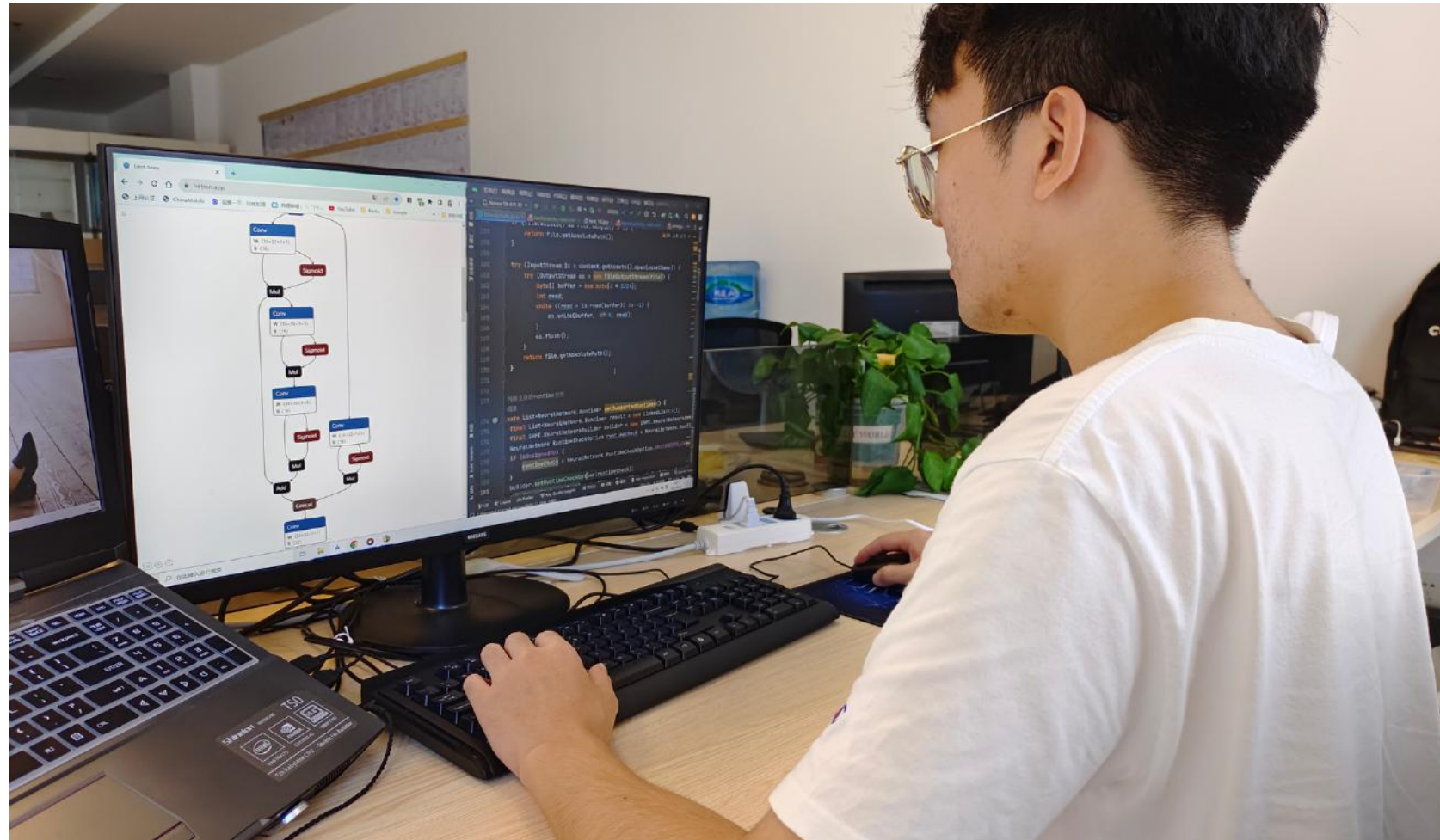
Software Development

We craft custom Android system, software and drivers for specialized industrial terminals.

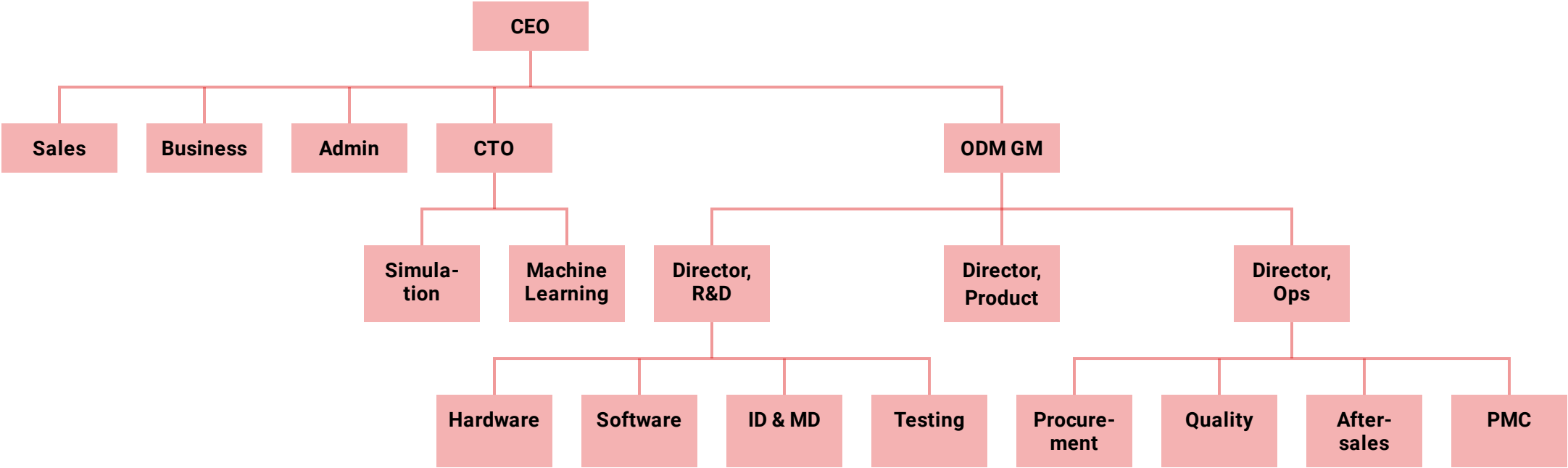


Artificial Intelligence Research

We develop proprietary artificial intelligence and machine learning algorithms with world-class research.



Comprehensive ODM organizational structure



Why Choose Us as Your Global ODM Partner

Why Choose Action as Your Global ODM Partner

- 1 | We Design for Manufacturing and Assembly**
- 2 | We Deliver Globally**
- 3 | We Innovate in Every Aspect**

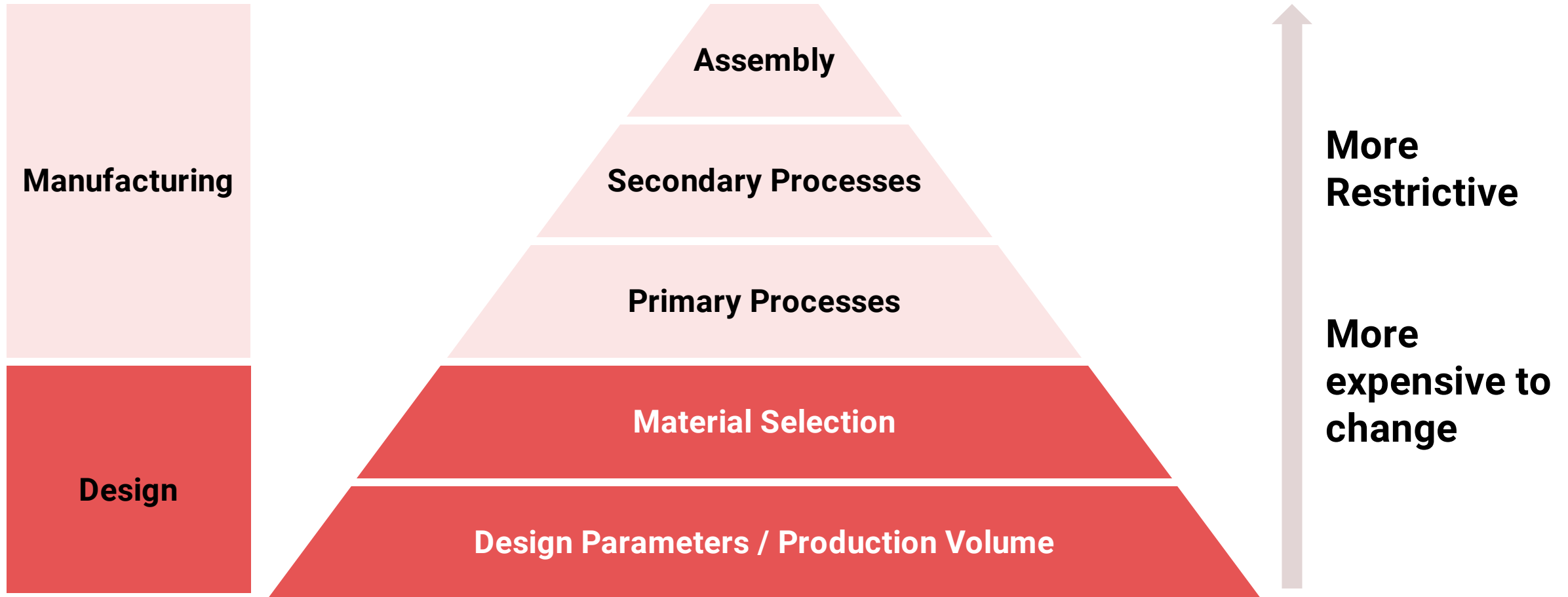
Why Choose Action as Your Global ODM Partner

- 1 | We Design for Manufacturing and Assembly**
- 2 | We Manufacture and Deliver Globally**
- 3 | We Innovate in Every Aspect**

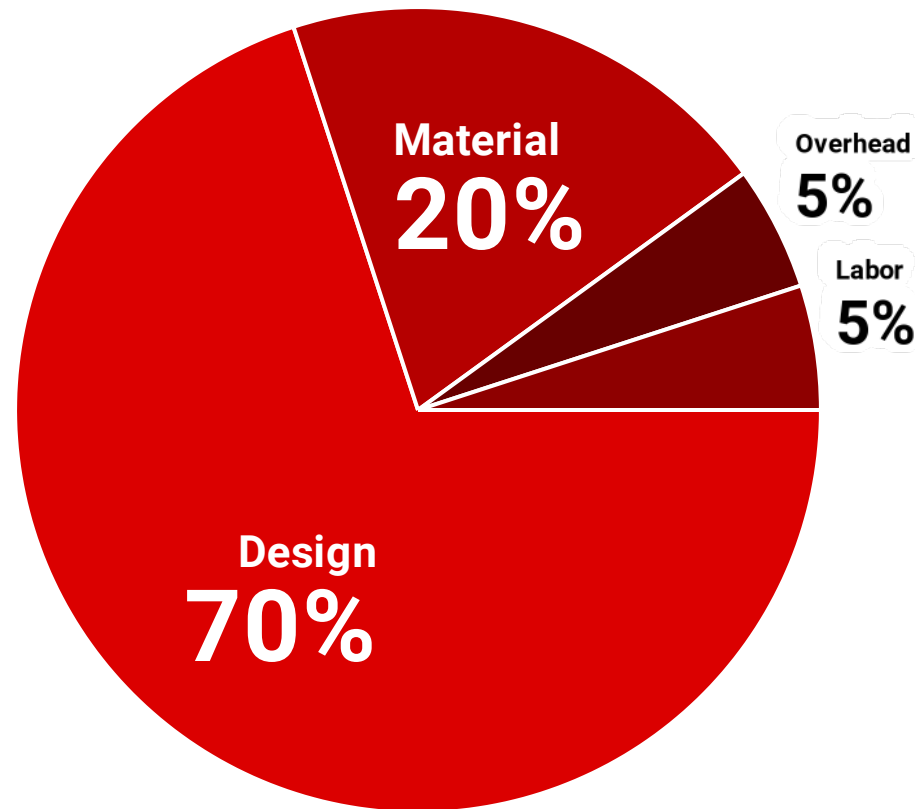
DfMA

The Problem

The Manufacturing Pyramid

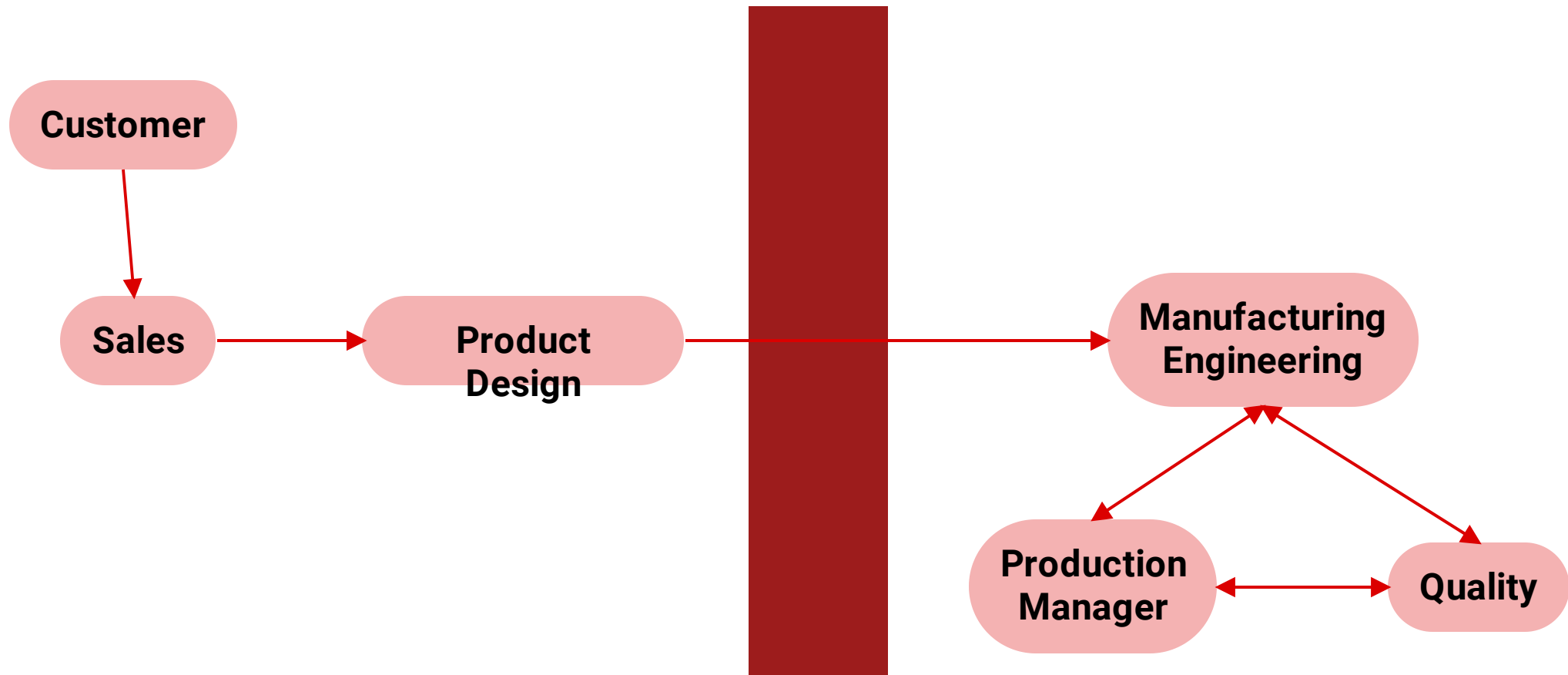


Product Cost is Influenced by ...

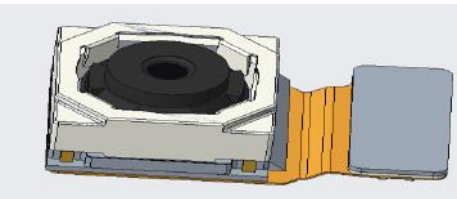
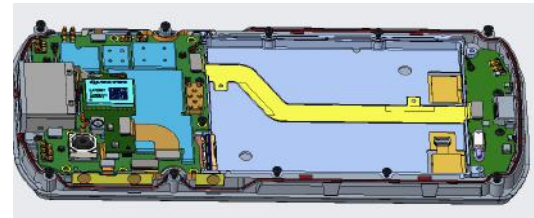
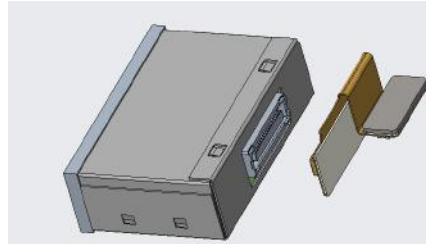
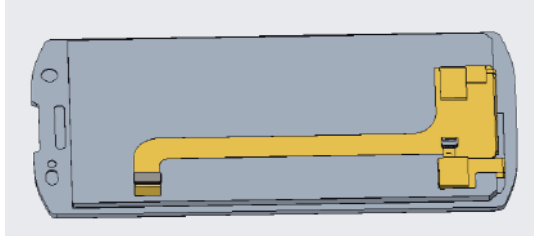
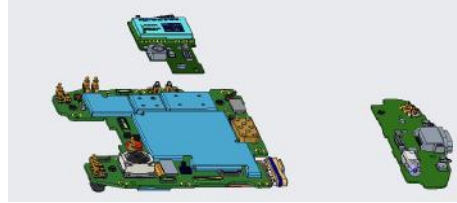
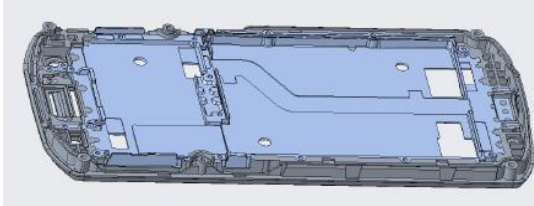


90% of the product cost is determined by the bottom of the pyramid!

"Over the Wall" Design Process



Case Study: Current PDA Design

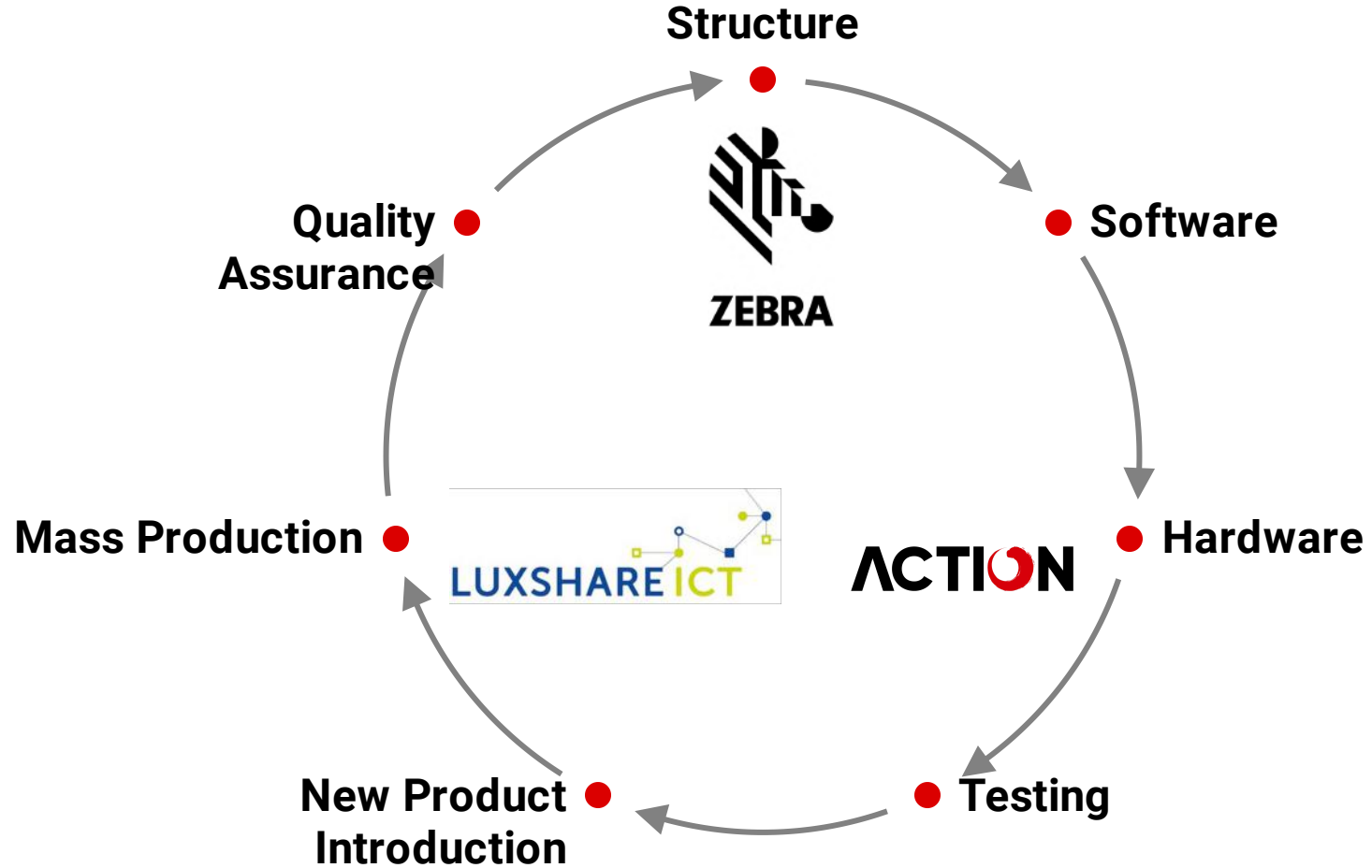


- Lots of parts (3 PCBs)
- Non-standard connection via flexible PCB
- Hard to automate
- Managing variations is a headache
- Not designed with assembly process in mind

DfMA

The Solution

Current Engineering



Manufacturing and Assembly from the Get-Go

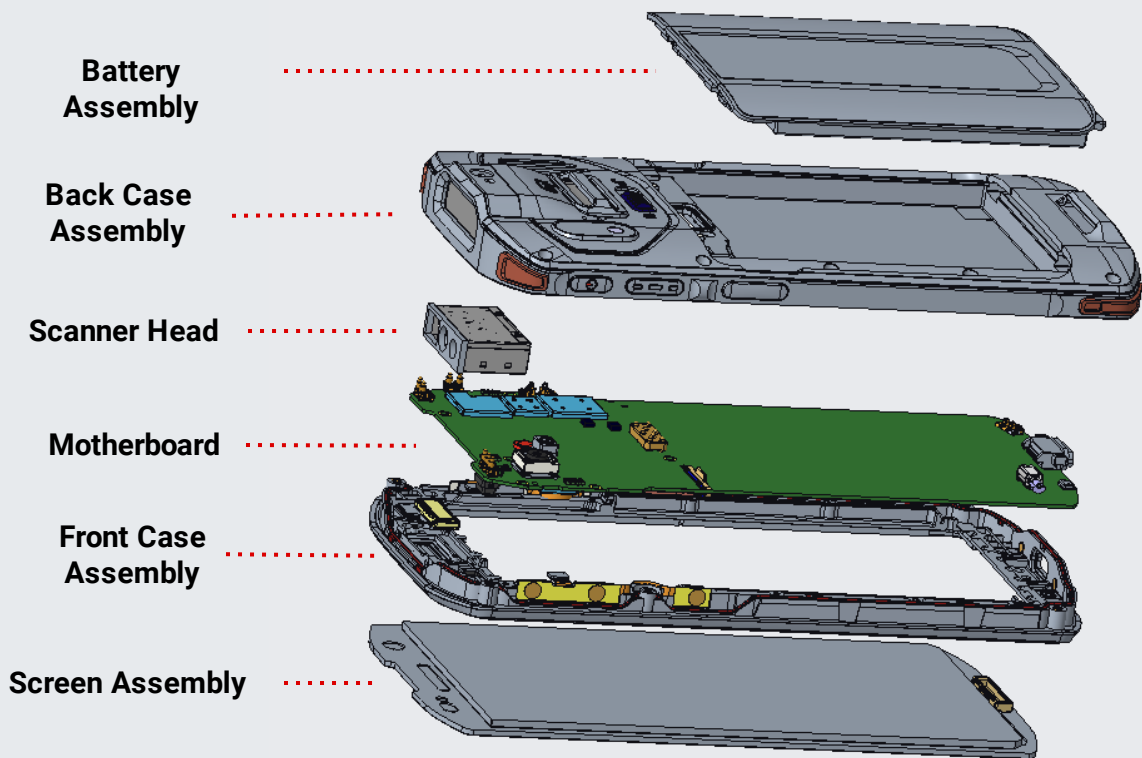
Design for Manufacturing

- **Standard materials and components**
- **Standardize design**
- **Use materials that are easy to process**
- **Designed to expected level of production**

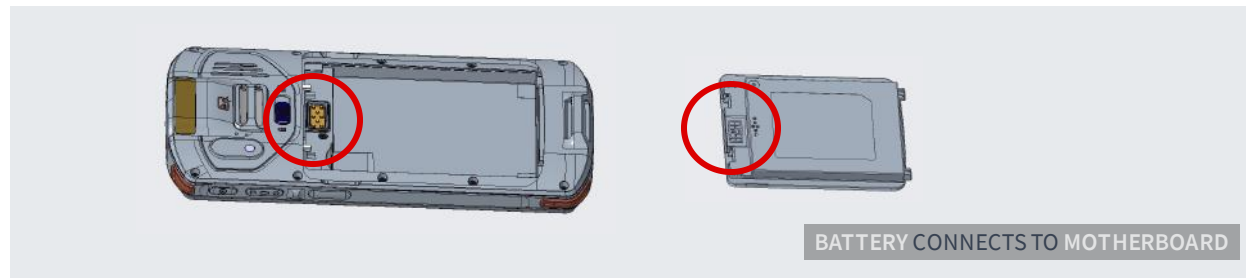
Design for Assembly

- **Reduce part count and part types**
- **Modularize parts**
- **Automation ready**

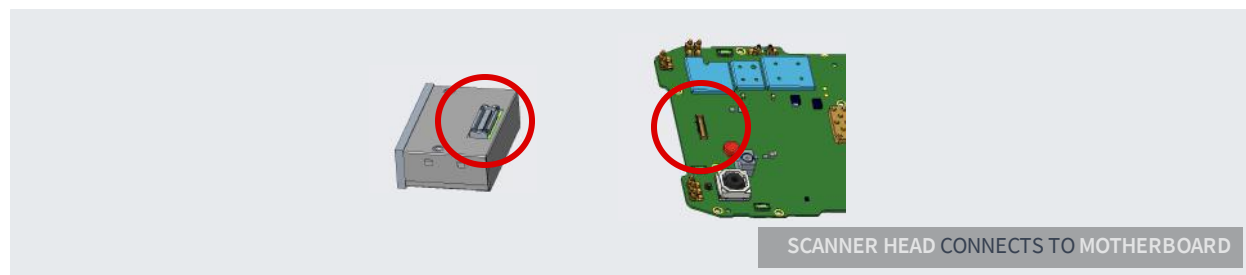
Case Study: A Simplified PDA Design



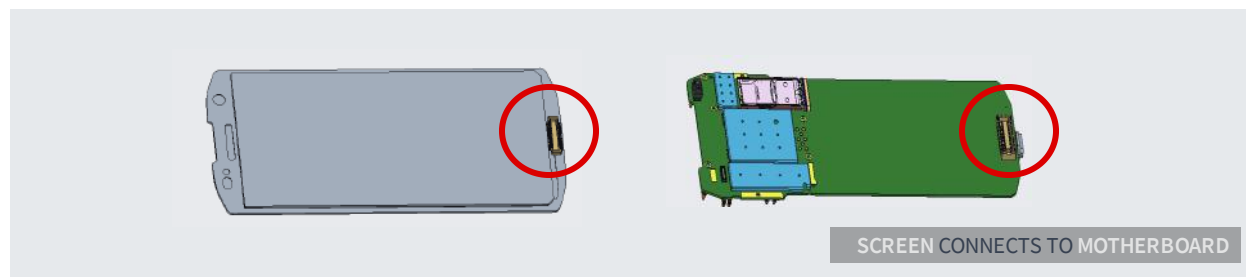
EXPLODED VIEW DIAGRAM



Battery solder pad connected to a POGO PIN

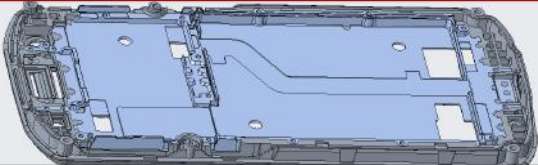
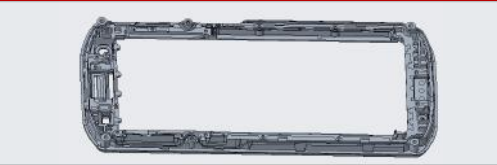
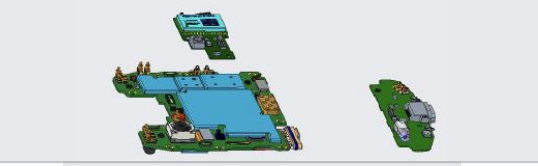

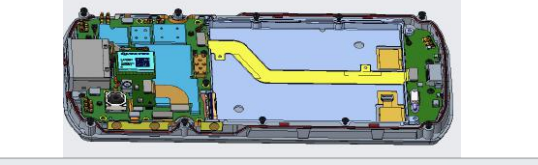
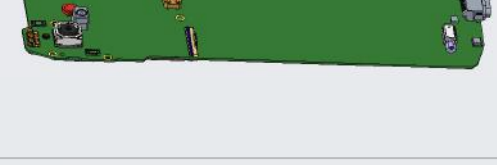
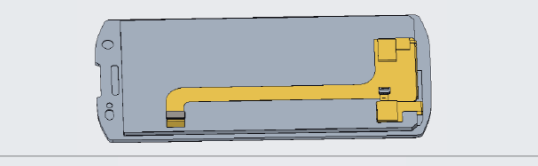

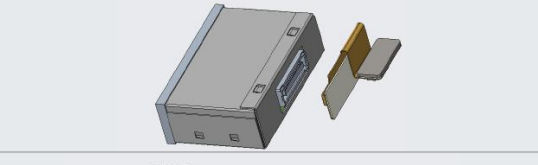

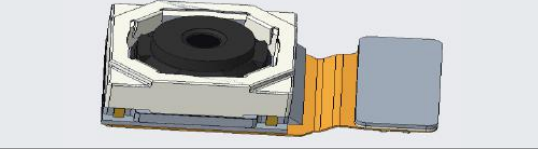
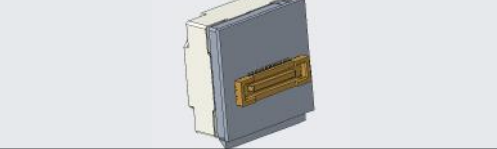


Scanner connected to motherboard using a B-TO-B connector



Screen connected to motherboard using a B-TO-B connector

Before and After Simplification

No.	Part	Before	After	Notes
1	Front Cover / Bracket			<ul style="list-style-type: none">- The aluminum alloy bracket is removed. The PCB adopts a new special material, and is integrated with the middle frame.- 3 PCBs are combined into 1.- Each module connects using connectors and is surface-mounted onto the main PCB.
2	PCB			
3	Type C Connector			
4	Screen			<p>Eliminate the Flexible Printed Circuit design and use a custom connector design to connect to the motherboard</p>
5	Scanner			
6	Camera			

DfMA

The Result

With DFMA, We Achieve...

- ✓ **simpler**, more **reliable** products
- ✓ **lower costs** for manufacturing and assembly
- ✓ **automated** assembly line
- ✓ **higher flexibility** to product variations
- ✓ **faster response** to client requests

Why Choose Action as Your Global ODM Partner

- 1 | We Design for Manufacturing and Assembly
- 2 | **We Manufacture and Deliver Globally**
- 3 | We Innovate in Every Aspect

Global Delivery

The Problem

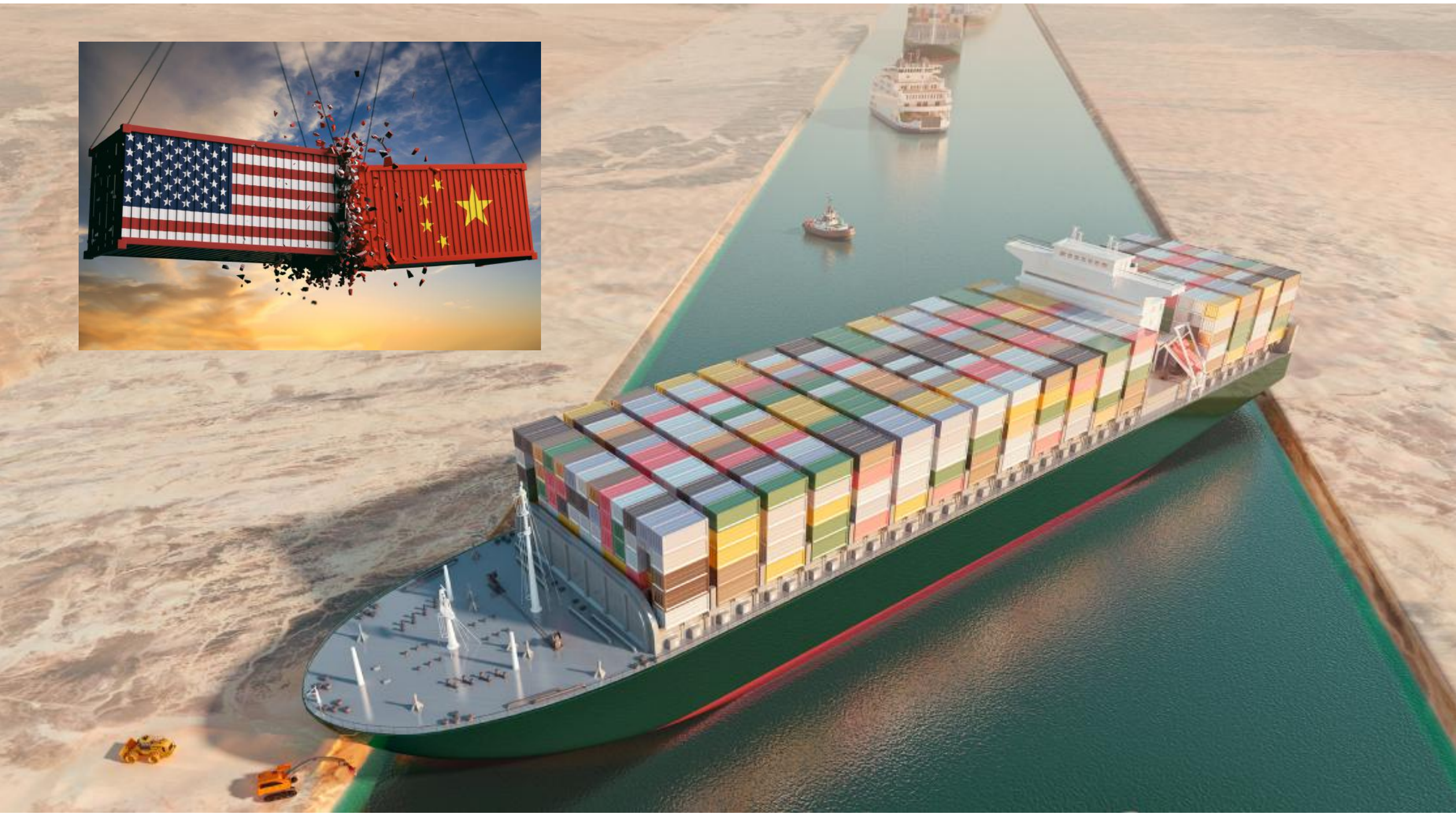
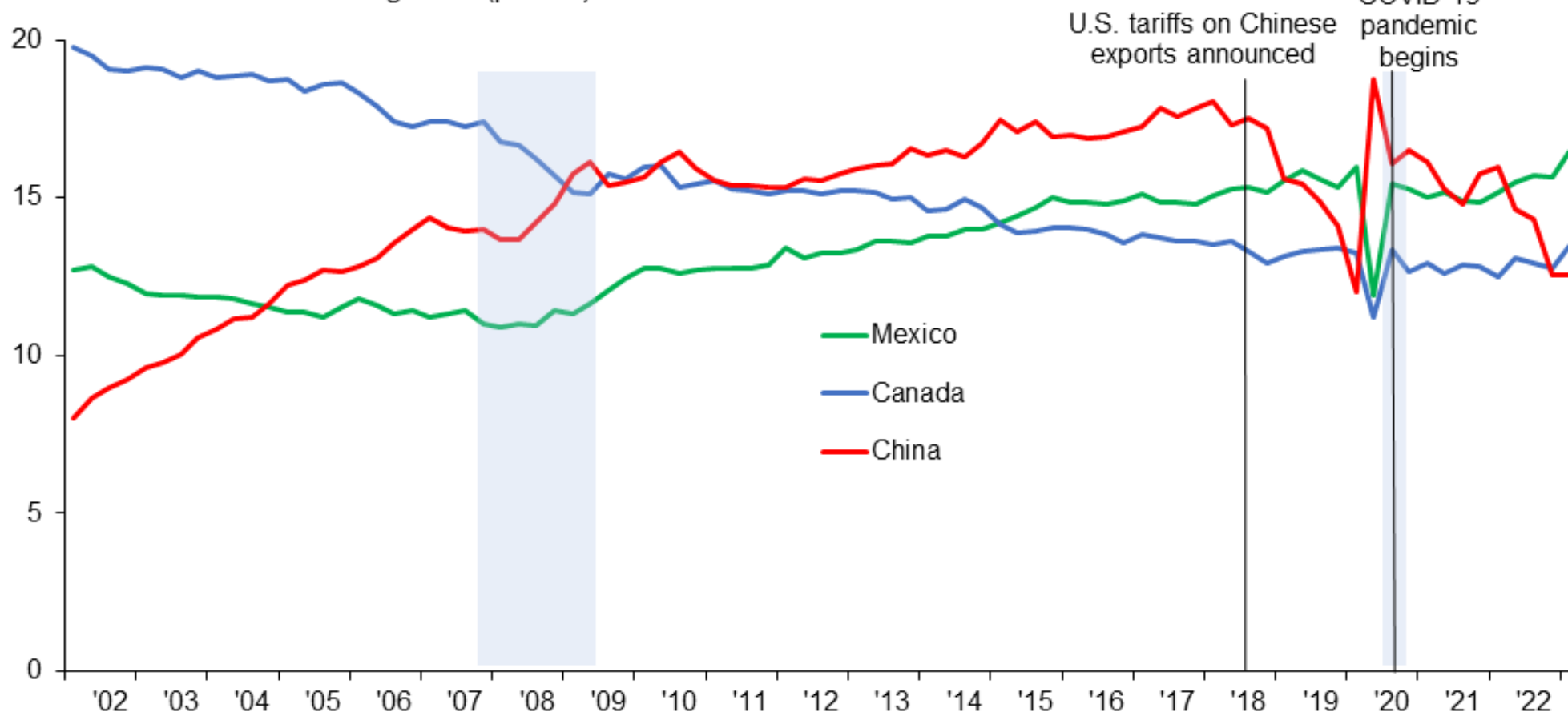


Chart 2

Mexico surpasses China as main U.S. manufacturing trading partner

Share of total U.S. manufacturing trade (percent)



NOTES: Seasonally adjusted, quarterly data. Figures also include April 2023. Shaded areas denote recessions. Total manufacturing trade is the sum of manufacturing exports and imports.

SOURCE: Census Bureau.

Global Delivery

The Solution

Modern Manufacturing Facilities Around the Globe

Worldwide Factories

25

21 @China, 4 @Vietnam

Manufacturing R&D Centers

7

Kunshan, Dongguan, Taiwan, Chuzhou

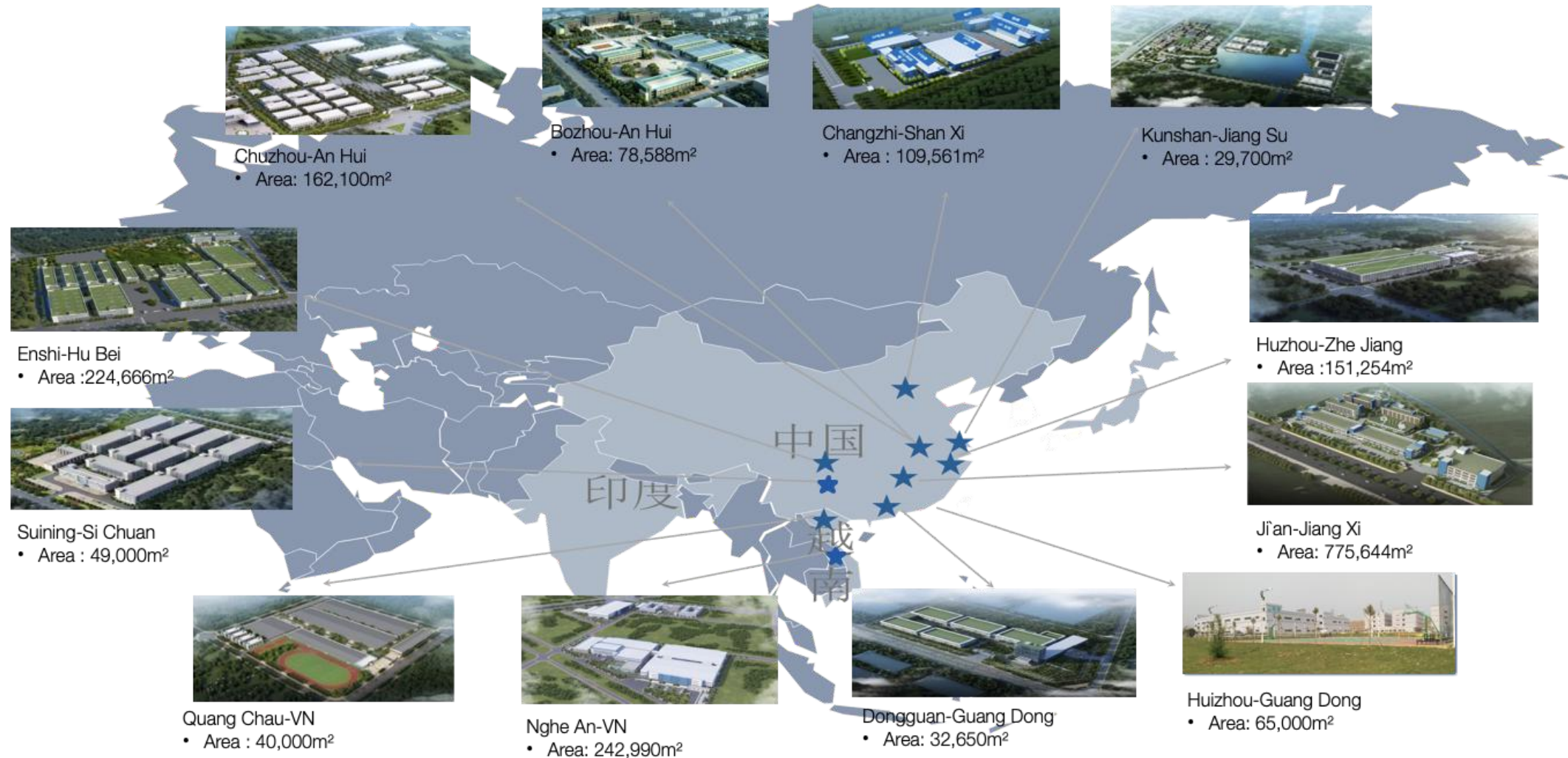
Total Employees

60,000+

Factory employees around the globe

Modern Manufacturing Facilities Around the Globe

Not shown on Map: Factories in Mexico and India



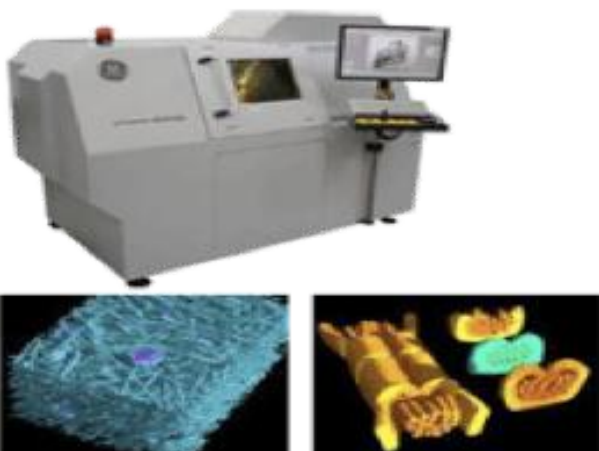
Comprehensive Testing Facilities



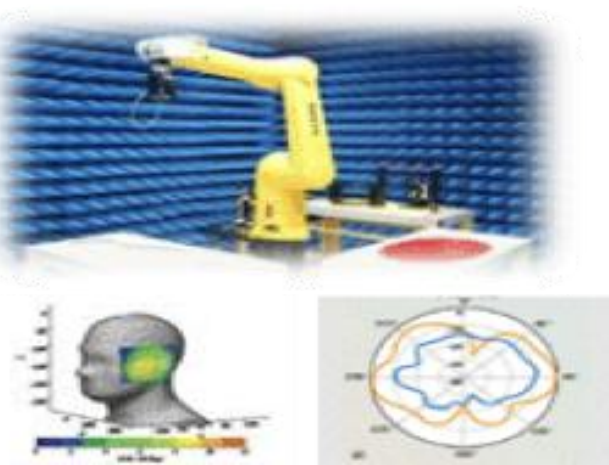
LAB DISTRIBUTION



DEPTH-OF-FIELD 3D MICROSCOPE



X-RAY COMPUTED TOMOGRAPHY



ANECHOIC ROOM



CHEMISTRY



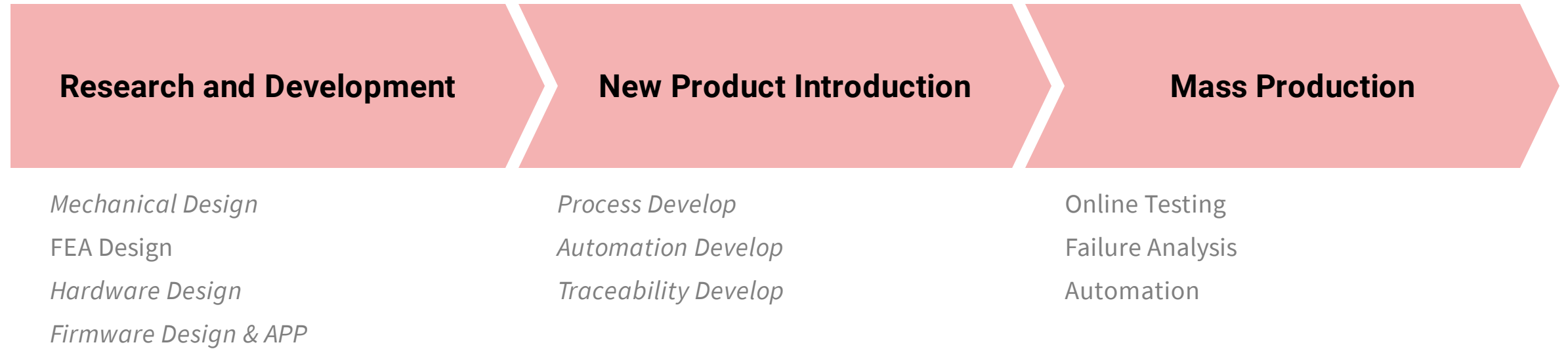
ELECTRICAL PARTS



STRUCTURE REPORTS

Rigorous Quality Control Process

We employ rigorous quality assurance processes at every step, from idea to mass production



Quality Control During R&D



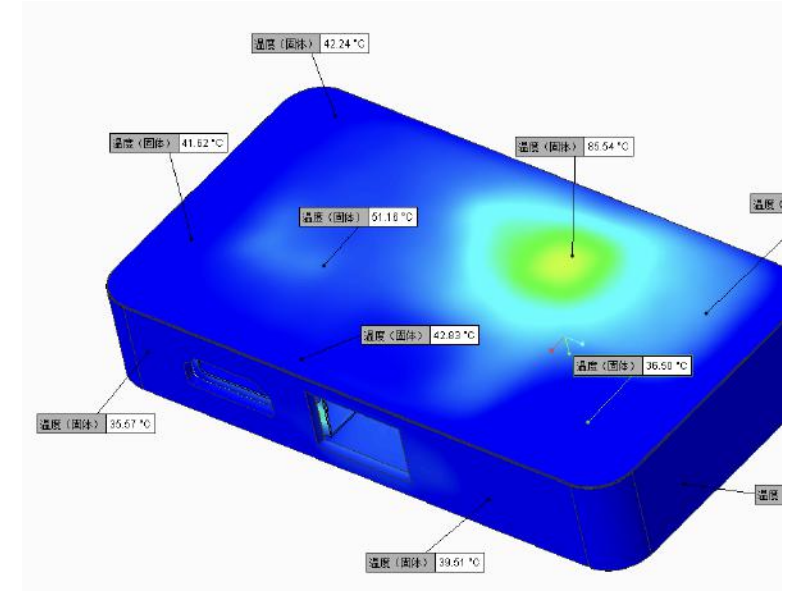
Design Validation

- ✓ Electrical test
- ✓ SI test
- ✓ Compatibility test



Reliability Test

- ✓ Mechanical
- ✓ Electronic
- ✓ Environmental
- ✓ Chemical



FEA Simulation

- ✓ SI simulation
- ✓ Thermal simulation
- ✓ Structures simulation
- ✓ Mold flow analysis

Quality Control During New Product Introduction



Test Station Develop

- ✓ Test flow/test plan develop
- ✓ Test board/fixture develop and tuning
- ✓ Test software develop and debug
- ✓ Test process optimization



Failure Analysis

- ✓ Fully FA including ME/EE/RF/Acoustic
- ✓ Full FA equipment/tools to support standardized FA flow and quick analysis
- ✓ Functional team to support FA/CA



Quality Assurance

- ✓ Incoming quality and supplier manage
- ✓ Process and output quality manage
- ✓ Quality analysis with MIL/Minitab/JMP tools PMP/SIP/MSOP define and control
- ✓ Full function lab for testing

Online Testing During Mass Manufacturing



PCBA Function Test

- ✓ Firmware Update
- ✓ Voltage and current test
- ✓ HDMI2.1/DP1.4
3840*2160/144Hz
- ✓ TYPE C full function
3840*2160/120Hz



Continuity Test

- ✓ Open
- ✓ Short
- ✓ Resistance
- ✓ Capacitance
- ✓ Impedance



On-load Test

- ✓ Standby power consumption test
- ✓ USB output 4.5W/7.5W
- ✓ TYPE C output
10W/15W/100W
- ✓ TYPE C fast charge 100W



Final Function Test

- ✓ Firmware Check
- ✓ HDMI 3840*2160/144Hz
- ✓ DP 3840*2160/60Hz
- ✓ VGA 2560*1080/60Hz
- ✓ USB3.0 Read/Write

Quality Assurance Capability



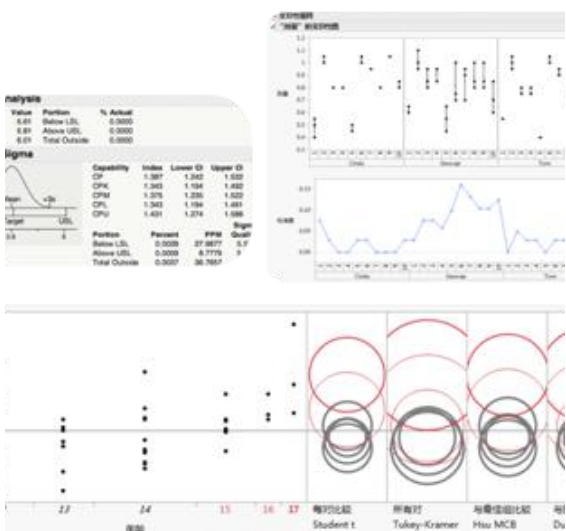
Quality System

- ✓ System Certification
- ✓ Product Certification



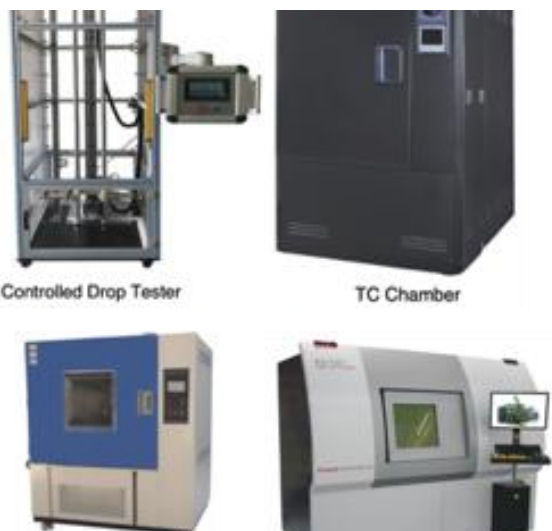
Continuity Test

- ✓ CMM
- ✓ 3D Scanner
- ✓ OMM & Laser
- ✓ Loading Tester
- ✓ Micrometer/Balance/Gauge



Statistical Techniques

- ✓ Process Performance
- ✓ Measurement System Analysis
- ✓ SPC Control
- ✓ Factor Analysis



Reliability/ORT

- ✓ Mechanical Test
- ✓ Chemical Test
- ✓ Environmental Test
- ✓ Electrical Test
- ✓ Failure Analysis Tester

Product/Production Manage System



SAP System

- ✓ Purchasing Management
- ✓ Production Management
- ✓ Sales Management
- ✓ Financial Management
- ✓ Employee Management



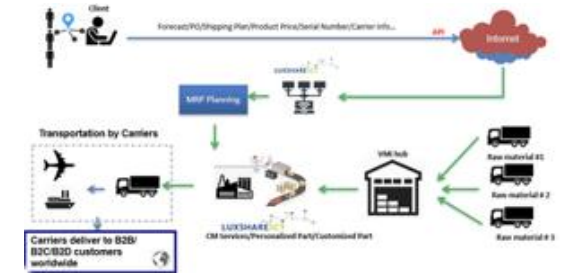
MES System

- ✓ Material Management
- ✓ Process Management
- ✓ Equipment Management
- ✓ Quality Management
- ✓ Dashboard Generation
- ✓ Product Traceability



PLM System

- ✓ New Product Implement Manage
- ✓ Cost/Quotation Manage
- ✓ Drawing Design Review
- ✓ Engineering Change Manage
- ✓ Sampling, Pilot Run



EDI System

- ✓ Electronic Data Interaction
- ✓ Various SKUs Shipment Manage
- ✓ Real-time Order Management
- ✓ Customized Application

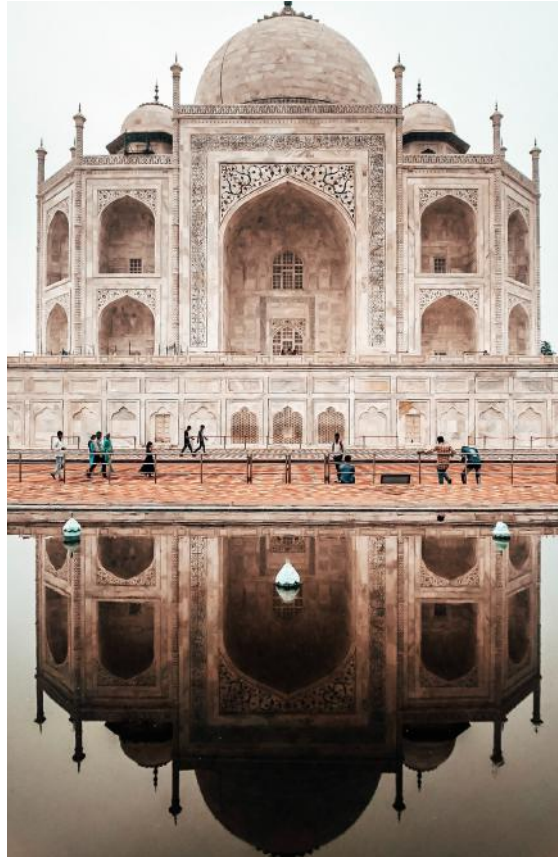
Global Delivery

The Result

Manufacture Locally, Deliver Locally.



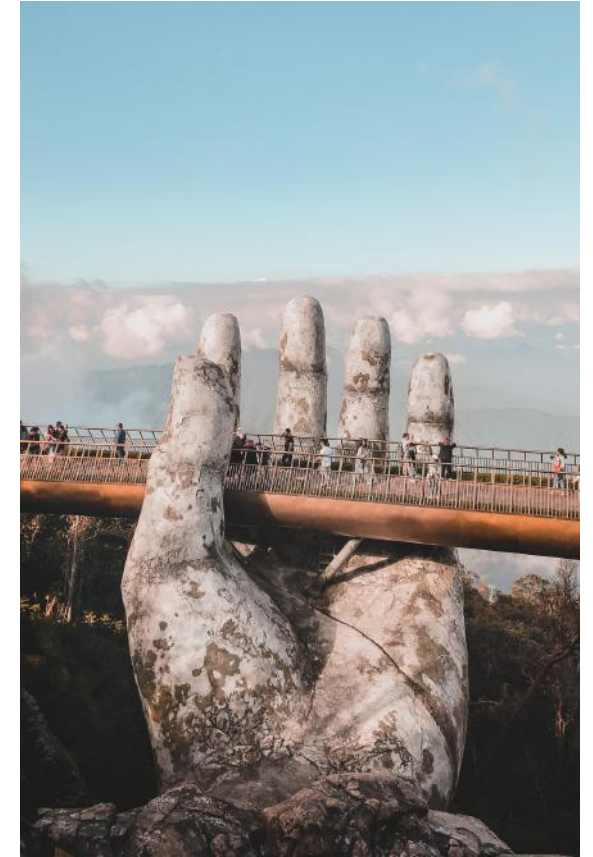
Mexico



India



Malaysia

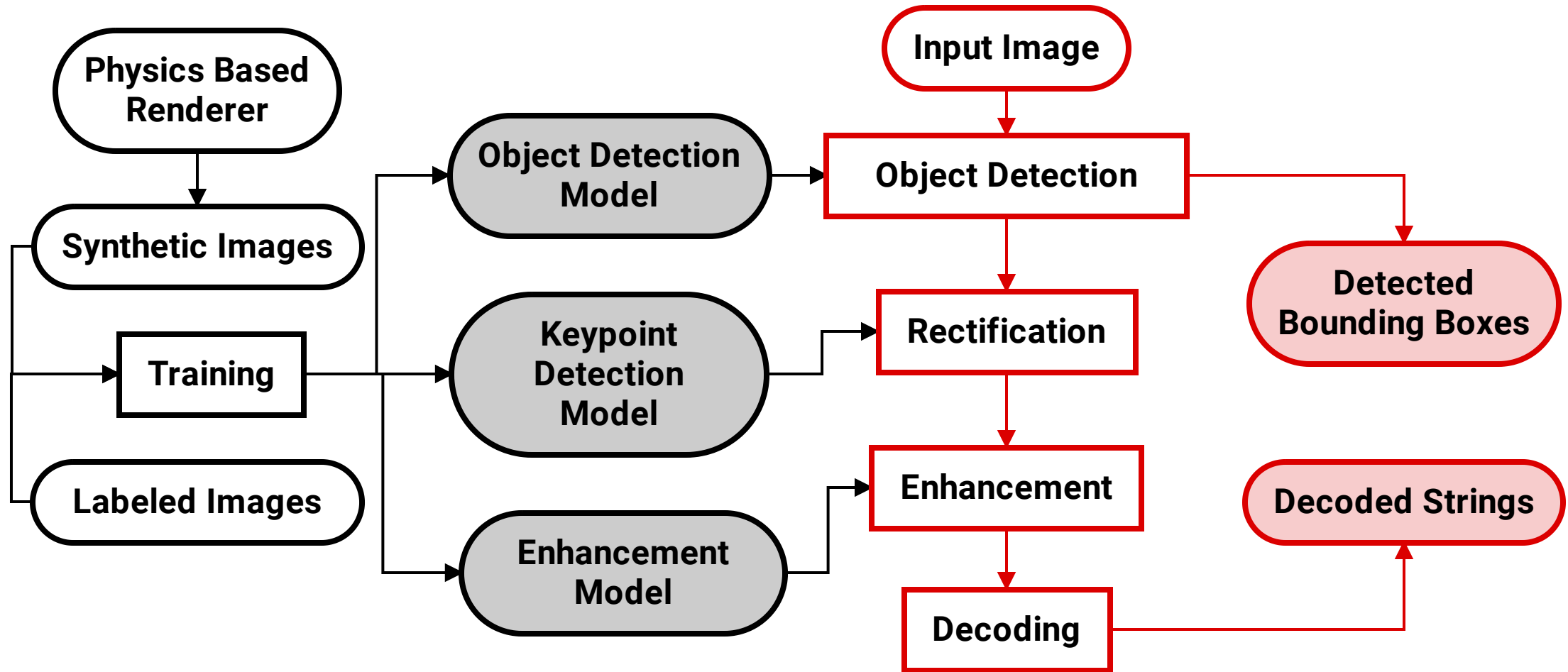


Vietnam

Why Choose Action as Your Global ODM Partner

- 1 | We Design for Manufacturing and Assembly
- 2 | We Manufacture and Deliver Globally
- 3 | **We Innovate in Every Aspect**

A Unified Deep Learning Framework for Barcode Scanning



A person wearing a red jacket, black pants, a black cap, and a backpack stands on the edge of a dark, rocky cliff. They are looking out over a vast, misty landscape with rolling hills and mountains in the distance. The sky is overcast and grey.

Your Vision, Our Expertise.

Partner with a global ODM leader.

CASE STUDY

Trusted By Clients for Over a Decade

We are trusted by





**Let's do
great things
together.**

info@action-prowave.com

ACTION