

# From Human Bottleneck to AI Efficiency

## Manufacturer Wins Big with a Hybrid Workforce

A case study



### CLIENT PROFILE

This \$2.3B global component manufacturer operates across North America, Europe, and Asia-Pacific with 8,500 employees worldwide.

Their custom orders business generates \$450M annually by producing engineered components for industrial applications, processing more than 12,000 specialized orders each year. The company's most profitable segment was constrained by manual BOM processing that required senior engineers to interpret complex customer specifications.

### OPERATIONAL CHALLENGES

A \$2.3B component manufacturer faced a critical bottleneck in their most profitable business line. Their custom orders operation required a dedicated workforce of 31 employees—23 senior engineers, 6 quality assurance reviewers, and 2 training specialists—to manually convert customer specifications into structured Bills of Materials, a process that had become unsustainable.

The human workforce problems:

- 31 employees costing \$4.1M annually for sophisticated data entry and review work
- 4.2 hours per order processing time creating customer delays
- 78% first-pass accuracy requiring expensive rework
- Peak season capacity constraints limiting revenue growth
- Knowledge locked in human minds creating business risk

Previous automation attempts had failed. Traditional RPA couldn't handle format variability, rules-based systems worked for only 15% of orders, and offshore processing resulted in 40% rework rates.

**The breaking point:** During peak seasons, the team could only process 35 orders per day, leaving hundreds of customers waiting and millions in revenue at risk.

### REQUIREMENTS

The client needed to reduce BOM processing time to under 2 hours per order while achieving 95%+ accuracy and maintaining full regulatory compliance. The solution required seamless integration with their existing SAP ERP system and the ability to scale processing capacity by 150% during peak periods without adding proportional staff.

### THE BIG TAKEAWAY

Our AI Workforce solution enabled a \$450M custom orders business to replace 29 employees with specialized AI workers, delivering \$3.955M in total annual savings and 77% workforce reduction.

This implementation allowed the manufacturer to increase their daily processing capacity 143% while maintaining rigorous industry compliance, demonstrating that even the most complex tribal knowledge can be successfully digitized at scale.

#### Measures & Key Results

- Cut costs
- Improve speed
- Increase capacity
- Reduce error rates
- Automate workflows



**77%**  
Reduction in workforce



**143%**  
Increase in daily capacity



**59.5%**  
Decrease in hours per order



**452%**  
ROI after first year

**\$3.225M**  
Annual labor savings

**\$730K**  
Annual rework cost savings

## THE AI EMPLOYEE SOLUTION

Rather than automating existing processes, we architected and built AI employees to replace human workers entirely. The solution deployed two specialized AI employees:



### AI Employee #1: BOM Processing Specialist

- Trained on 50,000 historical BOM pairs
- Interprets unstructured text and industry-specific acronyms
- Processes orders in 1.7 hours with 94% accuracy
- Works 24/7 without breaks or performance degradation

### AI Employee #2: Quality Assurance Specialist

- Reviews and validates BOMs with engineering expertise
- Flags potential manufacturing issues before production
- Maintains consistent quality standards across all orders
- Eliminates human "off days" and variability

### Human-AI Integration:

- 5 human supervisors oversee AI employees
- Human intervention required for only 18% of orders
- Escalation protocols for complex edge cases
- Continuous learning from human corrections

## WORKFORCE TRANSFORMATION

| ROLE                      | BEFORE            | AFTER                            | IMPACT                |
|---------------------------|-------------------|----------------------------------|-----------------------|
| Senior BOM Engineers      | 23 full-time      | 0                                | 23 roles eliminated   |
| AI Employee Supervisors   | 0                 | 5                                | New specialized roles |
| Quality Assurance         | 6 human reviewers | 1 AI worker + 1 human supervisor | 5 roles eliminated    |
| Training Specialists      | 2 full-time       | 1 (for AI employee development)  | 1 role eliminated     |
| Total Workforce Reduction | 31 employees      | 7 employees                      | 77% reduction         |

## FINANCIAL IMPACT

| METRIC                    | BEFORE                | AFTER                  | CHANGE         |
|---------------------------|-----------------------|------------------------|----------------|
| Annual Labor Costs        | \$4.1M (31 employees) | \$875K (7 supervisors) | 79% reduction  |
| Processing Cost per Order | \$342                 | \$73                   | 79% reduction  |
| Rework Costs              | \$890K annually       | \$160K annually        | \$730K savings |
| Total Annual Savings      | -                     | \$3.955M               | 452% ROI       |