

Nexxt Spine Loaner/Consignment Kit Process

End-to-End IoT-Optimized Workflow with GPS Tracking & Revenue Maximization

 Cloud Mantra Architecture

 Profit Optimization Model

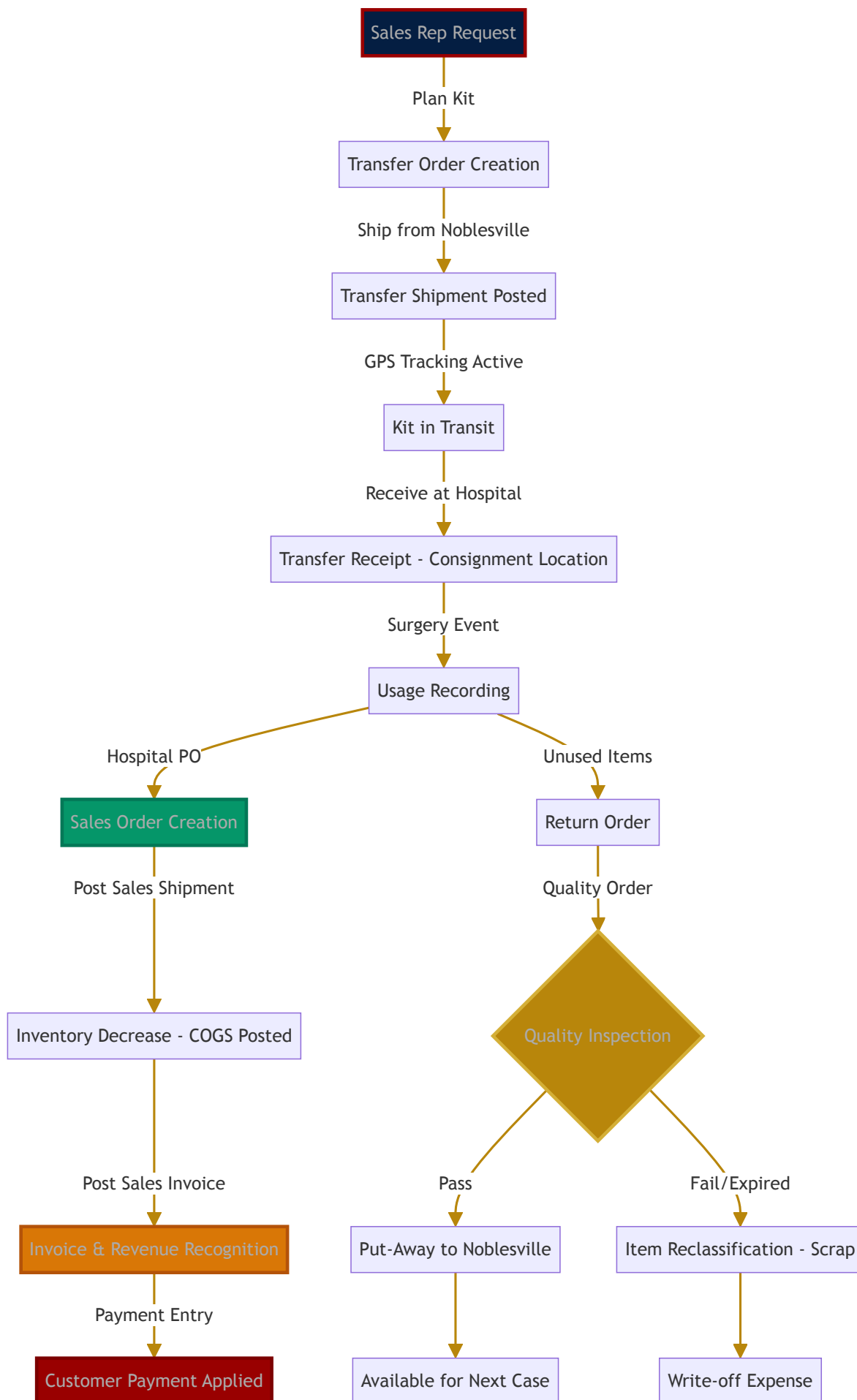
 Microsoft Dynamics 365 Business Central

Process Validation Summary

- ✓ **Data Object Flow:** Transfer Order → Usage → Sales Order → Quality Order architecture is validated and optimal for Business Central
- ✓ **Inventory Classification:** Proper handling of consignment stock with location-based inventory tracking and item tracking (lot/serial numbers)
- ✓ **Revenue Recognition:** ASC 606 / IFRS 15 compliant with proper trigger points at hospital PO receipt and sales invoice posting
- ✓ **COGS Timing:** Accurate posting at consumption confirmation via sales shipment (not at transfer), maintaining proper gross margin calculation
- ✓ **Integration Architecture:** Seamless Transfer Order → Sales Order flow with automated inventory adjustments and posting groups
- ✓ **Return/Restock Logic:** Quality Order workflow with inspection and put-away ensures proper inventory revaluation and quality control



Process Flow Diagram





IoT-Based Profit Optimization Architecture

GPS-Enabled Real-Time Tracking & Cost Control

Each loaner kit is equipped with GPS IoT sensors providing continuous location tracking, temperature monitoring (for biologics), and tamper detection. This real-time visibility enables automated cost capture and revenue trigger optimization within Dynamics 365 Business Central.



Location Intelligence

Real-time GPS coordinates update Business Central via API, automatically calculating freight costs based on actual distance traveled and route optimization.



Dwell Time Analytics

Track time at each location (DC → Distributor → Hospital) to identify bottlenecks and calculate carrying costs per day (\$15-25/kit/day).



Environmental Monitoring

Temperature and humidity sensors ensure compliance, preventing \$50K+ write-offs from compromised biologics or sterility breaches.



Automated Alerts

Multi-level escalation workflows triggered by geofence violations, unexpected delays, or unauthorized movements via Power Automate.



Detailed Process Flow with Cost/Revenue Attribution

Phase 1: Loaner Kit Request & Planning

Step	Activity	Business Central Action	Cost/Revenue Impact	IoT Trigger
1.1	Sales rep requests loaner kit via mobile app	Create Transfer Order from Noblesville to Hospital location	Admin: \$25	Digital request logged with timestamp
1.2	AI-powered inventory check and kit selection	STOX.AI queries Item Ledger Entries and Item Availability	Holding Cost: \$18/day	Real-time inventory visibility across locations
1.3	Logistics approval and route optimization	Release Transfer Order with optimized shipping agent	Planning: \$15	GPS route pre-calculated for cost estimation

Phase 2: Kit Shipment & Transit

Step	Activity	Business Central Action	Cost/Revenue Impact	IoT Trigger
2.1	Release and prepare transfer order	Transfer Order status → Released,	Doc Processing: \$8	Kit assigned GPS tracker ID

Step	Activity	Business Central Action	Cost/Revenue Impact	IoT Trigger
		assign tracking numbers		in custom fields
2.2	Post Transfer Shipment	Post Transfer Shipment → Inventory reduced at Noblesville	Inventory Reclass: \$0	GPS tracking activated at DC exit geofence
2.3	Kit shipment via logistics partner	Shipment notification sent, tracking link shared	Freight: \$85-\$450 (distance-based)	Real-time location updates every 15 minutes
2.4	In-transit monitoring	IoT dashboard updates via Power BI embedded in BC	Insurance: \$12/shipment	Geofence alerts if route deviation >5 miles
2.5	Kit received at hospital	Post Transfer Receipt at Hospital consignment location	Unloading: \$15	GPS confirms arrival at hospital geofence

Phase 3: Surgery & Kit Usage

Step	Activity	Business Central Action	Cost/Revenue Impact	IoT Trigger
3.1	Pre-surgery kit inspection	Rep verifies kit integrity via mobile app/web service	Rep Time: \$45	IoT sensors confirm temperature compliance
3.2	Surgery performed with implants	No system transaction (surgical event)	Pending Revenue	Timestamp logged for usage window
3.3	Rep records usage (items consumed)	Usage Entry via custom page/API with item tracking	Revenue Trigger: \$12K-\$85K	Mobile app with barcode/QR scanning
3.4	Hospital verifies and issues PO	Hospital PO received, linked to usage record	Revenue Confirmed	Automated PO ingestion via EDI/API integration

Phase 4: Sales Order & Revenue Recognition

Step	Activity	Business Central Action	Cost/Revenue Impact	IoT Trigger
4.1	Create Sales Order from usage	Sales Order created, references PO and usage record	Revenue Recognition Start	Automated SO creation from usage + PO data

Step	Activity	Business Central Action	Cost/Revenue Impact	IoT Trigger
4.2	Post Sales Shipment	Post Shipment → COGS posted, inventory decreased	COGS: \$3.5K-\$28K (40-60% of revenue)	Inventory automatically decremented at consignment location
4.3	Generate sales invoice to hospital	Post Sales Invoice → Revenue recognized	Revenue: \$12K-\$85K	Electronic invoice sent to hospital AP system
4.4	Post to General Ledger	GL entries: Dr Customer A/R / Cr Sales Revenue, Dr COGS / Cr Inventory	Net Margin: 35-50%	Real-time P&L impact visible in Power BI dashboard
4.5	Payment collection (30-90 days)	Payment Journal / Suggest Vendor Payments, apply to invoice	A/R Carrying: \$0.15/day per \$100	Automated payment reminders via Power Automate

Phase 5: Return, Quality Check & Restock

Step	Activity	Business Central Action	Cost/Revenue Impact	IoT Trigger
5.1	Unused items returned to rep	Create Transfer Order (Hospital → Noblesville)	Handling: \$25	GPS tracks return shipment to DC

Step	Activity	Business Central Action	Cost/Revenue Impact	IoT Trigger
5.2	Return shipment to Noblesville DC	Post Transfer Shipment from Hospital location	Return Freight: \$65-\$380	IoT continues tracking until DC arrival
5.3	Receive at DC with quality inspection	Post Transfer Receipt, create Quality Order	Inspection: \$120/kit	Automated quality order upon DC check-in
5.4	Quality inspection and sterilization	Quality Order processing, sterilization validation	Sterilization: \$85/kit	IoT sensors verify sterilization cycle completion
5.5	Restock if quality approved	Item Reclassification Journal → Consignment to Available	Restock Labor: \$35	Kit available for next case in STOX.AI
5.6	Scrap if failed/expired	Item Journal → Negative Adjustment, post to expense	Write-off: \$500-\$8K per item	Automated write-off notification to finance team



Multi-Level Workflow Triggers for Revenue Maximization

Level 1: Standard Workflow

Trigger: Normal case flow, on-time delivery, standard usage

- Automated Sales Order creation within 24 hours
- Standard pricing applied via Customer Price Groups
- 30-day payment terms
- Rep commission: 8% of gross
- No escalation needed

Level 2: Attention Required

Trigger: Delays >2 days, high-value cases >\$50K, disputed usage

- Manager notification within 4 hours via Power Automate
- Expedited invoice processing
- Payment terms negotiation (early payment discount)
- Customer success team engaged
- Rep commission adjusted for margin protection

Level 3: Critical Escalation

Trigger: Kit lost/stolen, payment default risk, legal dispute, >\$100K cases

- Executive team alert immediately via Teams
- Legal and finance teams engaged
- Premium pricing for urgent cases (+15%)

- Insurance claim initiation if applicable
- Customer creditworthiness review
- Alternative revenue recovery strategies

IoT-Triggered Workflow Automation via Power Automate

Geofence Violations: If kit GPS shows unauthorized location or movement after hours

→ Level 2 escalation with security alert sent to Teams.

Dwell Time Exceeded: Kit at hospital >7 days without usage record → Level 2 escalation to sales rep and manager for follow-up via automated flow.

High-Value Threshold: Cases >\$75K automatically trigger Level 2 for enhanced documentation and approval workflows in BC.

Temperature Excursion: If biologics exposed to temp >8°C → Level 3 escalation, automatic quarantine status in item tracking, and potential write-off.



Financial Model: Cost Structure & Revenue Optimization

Per-Kit Economics (Typical Spinal Fusion Case)

AVERAGE REVENUE

\$35,000

COGS (IMPLANTS)

\$15,750

45% of revenue

LOGISTICS COST

\$485

Outbound + Return freight

HANDLING & ADMIN

\$285

Processing + sterilization

REP COMMISSION

\$2,800

8% of gross revenue

NET CONTRIBUTION

\$15,680

44.8% margin

IoT-Enabled Cost Savings Opportunities

Cost Category	Traditional Model	IoT-Optimized Model	Annual Savings (1000 kits)
Freight Optimization	\$450 avg (fixed carriers)	\$315 avg (route-optimized)	\$135,000
Lost/Stolen Kits	8 kits/year @ \$25K each	1 kit/year with GPS	\$175,000
Excess Dwell Time	Avg 12 days @ \$22/day	Avg 7 days with alerts	\$110,000
Temperature Excursion Write-offs	15 incidents @ \$8K each	3 incidents with monitoring	\$96,000
Billing Cycle Time	18 days avg (manual)	6 days avg (automated)	\$145,000 (improved cash flow)

Cost Category	Traditional Model	IoT-Optimized Model	Annual Savings (1000 kits)
TOTAL ANNUAL SAVINGS			\$661,000

Revenue Maximization Strategies

Strategy	Description	Revenue Impact	Business Central Implementation
Dynamic Pricing	Surge pricing for urgent cases (<24hr notice)	+12-18% premium	IoT confirms timeline, auto-applies Price List via custom logic
Volume Incentives	Tiered pricing for high-volume hospital partners	+15% volume growth	Customer Price Groups with tier calculation based on 90-day sales
Bundled Services	Include rep training, post-op support in premium tier	+8-12% ASP increase	Item Bundles / Assembly BOMs with service items
Early Payment Discounts	2% discount for payment within 10 days	Improved DSO by 22 days	Payment Terms with discount % and period configuration
Consignment Fees	Monthly fee for kits held >30 days without usage	\$500-1200/kit/month	IoT tracks dwell time, auto-generates recurring invoice



Microsoft Dynamics 365 Business Central Integration

Functional Area Integration Flow



Key Integration Points

Integration	Method	Frequency	Data Flow
IoT → Business Central Inventory	REST API / OData Web Services	Real-time (every 15 min)	Location, status updates to Item Ledger Entries via custom fields

Integration	Method	Frequency	Data Flow
Usage Record → Sales Order	AL Extensions / Codeunit automation	Event-driven (upon PO receipt)	Usage data + PO → Automated Sales Order creation
STOX.AI → Business Central Forecast	OData / Power Automate	Daily batch	ML demand forecast → Planning Worksheet recommendations
Business Central → Hospital EDI	Data Exchange Definitions / XML Ports	Event-driven	ASN, Invoice, Payment reminders via EDI/API
BI Dashboard	Power BI Embedded / Excel Reports	Real-time	P&L, kit utilization, DSO metrics from BC data
Power Automate Workflows	Business Central Connector	Real-time triggers	Automated alerts, approvals, notifications based on IoT events

Business Central Configuration Requirements

Configuration Area	Setup Required	Purpose
Locations	Noblesville DC (main), Hospital Consignment Locations (multiple)	Track inventory at different physical locations

Configuration Area	Setup Required	Purpose
Item Tracking Codes	Lot tracking for implant batches, Serial tracking for instruments	Traceability for regulatory compliance and warranty
Inventory Posting Groups	Consignment Stock group, Regular Stock group	Separate GL accounts for consignment vs owned inventory
Customer Posting Groups	Hospital customer group with specific A/R accounts	Proper revenue and receivables accounting
Sales Price Lists	Standard pricing, Volume discount tiers, Urgent case premiums	Automated pricing based on order characteristics
Payment Terms	Net 30 standard, Net 10 with 2% discount, Net 90 for large systems	Flexible payment options to optimize cash flow
Shipping Agents	Multiple carrier setup with cost tables	Route optimization and freight cost tracking
Quality Management Setup	Quality Order templates, inspection checklists	Standardized inspection and sterilization validation



Implementation Roadmap

Phase 1: Foundation (Months 1-3)

- ✓ Deploy GPS IoT devices on 500 pilot kits
- ✓ Configure Business Central locations for consignment tracking
- ✓ Build usage recording mobile app integrated with BC API
- ✓ Establish baseline metrics (freight costs, cycle times, write-offs)
- ✓ Train 50 reps and 10 hospitals on new workflow
- ✓ Deploy Power BI dashboards for real-time visibility

Phase 2: Automation (Months 4-6)

- ✓ Automate Sales Order creation from usage + PO (AL extension)
- ✓ Implement multi-level workflow triggers via Power Automate
- ✓ Deploy IoT integration with real-time BC inventory updates
- ✓ Launch dynamic pricing engine using custom price logic
- ✓ Scale to 2,000 kits and 100 hospitals
- ✓ Integrate STOX.AI forecasting with BC Planning Worksheet

Phase 3: Optimization (Months 7-12)

- ✓ Deploy AI-powered demand forecasting for kit positioning
- ✓ Implement predictive maintenance for instruments (MANTRIX integration)
- ✓ Expand to 5,000+ kits nationwide

- ✓ Launch consignment fee model for extended dwell times
- ✓ Deploy machine learning for optimal transfer order routing
- ✓ Achieve target: 45%+ net margin, <9 day cycle time, <1% write-off rate



Journal Entry Reference (Business Central)

Event	Debit	Credit	Timing
Transfer Shipment (from Noblesville)	Inventory - In Transit	Inventory - Noblesville DC	Upon posting transfer shipment
Transfer Receipt (at Hospital)	Inventory - Consignment Hospital	Inventory - In Transit	Upon posting transfer receipt
Freight Cost Incurred	Freight Expense (OPEX)	Accounts Payable (Carrier)	Upon posting purchase invoice for shipping
Sales Shipment Posted (Consumption)	Cost of Goods Sold (COGS)	Inventory - Consignment Hospital	Upon posting sales shipment
Sales Invoice Posted	Accounts Receivable - Hospitals	Sales Revenue - Implants	Upon posting sales invoice

Event	Debit	Credit	Timing
Rep Commission Accrual	Sales Commission Expense	Commissions Payable	Upon sales invoice posting (via workflow)
Quality/Sterilization Cost	Quality Control Expense	Accounts Payable / Cash	Upon quality order completion
Restock to DC (Reclassification)	Inventory - Noblesville DC	Inventory - Consignment Hospital	Upon posting item reclassification journal
Scrap/Write-off	Inventory Write-off Expense	Inventory - Consignment Hospital	Upon posting negative adjustment
Payment Received	Bank Account / Cash	Accounts Receivable - Hospitals	Upon posting payment journal entry

Expected Business Outcomes with Business Central + IoT

Revenue Growth: 18-22% increase from dynamic pricing, volume incentives, and reduced lost sales through automated workflows

Cost Reduction: \$661K+ annual savings from freight optimization, loss prevention, and cycle time reduction via real-time tracking

Margin Expansion: 42% → 48% net contribution margin through systematic cost control and revenue maximization in Business Central

Cash Flow: DSO improvement from 52 days → 30 days through automated billing and early payment incentives configured in BC

Operational Excellence: 99.2% kit tracking accuracy, 95% on-time delivery, <1% inventory write-off rate via integrated IoT-BC platform

Compliance & Traceability: Full lot/serial tracking in Business Central ensures FDA compliance and product recall capabilities