NIIR PROJECT CONSULTANCY SERVICES

[NPCS]

CLIENT CASE STUDY

Strategic Manufacturing Investment

IV Fluid Manufacturing Plant

Nairobi, Kenya

Transforming Investment Vision into Pharmaceutical Reality

Prepared for: M/s. Niraj Shah | Nairobi, Kenya

ABOUT NPCS

Niir Project Consultancy Services (NPCS) is a leading industrial consultancy organization headquartered in India, providing comprehensive project advisory services to entrepreneurs, investors, and industrial groups worldwide.

> "NPCS is part of Asia's leading industrial knowledge ecosystem with thousands of project profiles and global consulting expertise."

Core Service Areas

- **Detailed Project Reports (DPR):** Bankable, investor-grade manufacturing project reports across 100+ industries.
- **Techno-Economic Feasibility Studies:** Rigorous analysis of technical viability, capital requirements, and financial returns.
- **Market Research & Industry Analysis:** Demand assessment, competitive landscape, pricing, and import/export dynamics.
- **Engineering & Technical Advisory:** Plant layout, machinery selection, process flow design, and quality standards guidance.
- **Business Plan Development:** Comprehensive business planning for startups, SMEs, and large-scale industrial investors.

Our Global Reach

NPCS has successfully supported clients across Asia, Africa, Middle East, Europe, and the Americas. With a multidisciplinary team of engineers, economists, and industry specialists, NPCS translates complex manufacturing investment decisions into clear, actionable strategies backed by robust data.

30,000+	50+	30+	250,000+
Detailed Project Reports Published	Countries Served Globally	Years of Industrial Expertise	Industrial Projects Delivered

PROJECT SNAPSHOT

Client Name	M/s. Niraj Shah
Location	Nairobi, Kenya
Industry	Pharmaceutical & Healthcare Manufacturing
Project Recommended	Manufacturing of IV Fluids (Intravenous Fluids)
Consultancy Type	Techno-Economic Feasibility Study, Market Assessment & Strategic Advisory
Implementation Status	Client approved feasibility insights; moved forward with project implementation planning

CLIENT OVERVIEW & BACKGROUND

M/s. Niraj Shah is an experienced entrepreneur based in Nairobi, Kenya, with a vision to establish a large-scale, high-impact manufacturing venture. Recognizing the rapid evolution of East Africa's healthcare landscape, the client sought to enter the pharmaceutical and medical consumables sector as a strategic long-term investment.

The client approached NPCS with a clear investment mandate: identify a manufacturing opportunity that combines consistent demand, long-term operational sustainability, alignment with regional healthcare needs, and strong financial returns. The client required expert consultancy backed by rigorous market data and financial modeling.

Client's Core Investment Goals

- Identify a high-demand, scalable manufacturing business with institutional buyers
- Ensure long-term operational sustainability even through economic cycles
- Align the project with regional healthcare infrastructure growth in East Africa
- Achieve financial viability through a comprehensive techno-economic feasibility study
- Build a foundation for potential export expansion into neighboring African markets

⚠PROBLEM STATEMENT & CHALLENGES

Before engaging NPCS, M/s. Niraj Shah faced several critical challenges in defining and de-risking the proposed manufacturing investment:

1. Market Gaps & Demand Uncertainty

East Africa's healthcare market is growing rapidly, yet the investor had limited visibility into quantified demand, competitive supply dynamics, and pricing structures for pharmaceutical-grade products in the region.

2. Technical Limitations in Process Knowledge

IV fluid manufacturing involves sterile pharmaceutical production — a highly regulated, technically complex process. Without specialized knowledge in aseptic manufacturing, plant design, and GMP compliance, identifying a viable production model was a significant barrier.

3. Financial Risk & Capital Planning

Large-scale pharmaceutical investments involve substantial capital deployment. The client needed a rigorous, data-backed financial model covering capital expenditure, operating costs, revenue projections, and return timelines to justify investment and secure potential financing.

4. Supply Chain & Raw Material Accessibility

Pharmaceutical-grade raw materials (WFI-quality water, electrolytes, sterile packaging) require reliable supply chains. Understanding local and import sourcing options was critical to cost estimation and operational planning.

5. Regulatory Complexity

Pharmaceutical manufacturing in Kenya requires compliance with multiple regulatory frameworks including the Pharmacy and Poisons Board (PPB) of Kenya, WHO GMP standards, and regional health authority requirements — a complex landscape requiring expert navigation.

NPCS APPROACH & STRATEGY

NPCS deployed a structured, multi-phase consultancy methodology to guide M/s. Niraj Shah from investment ideation through validated project implementation planning:

Step 1 — Multi-Sector Opportunity Identification

NPCS evaluated investment opportunities across healthcare consumables, agro-processing, chemical manufacturing, and packaging sectors to identify the highest-return, lowest-risk option for the client's profile. IV fluid manufacturing emerged as the optimal choice based on demand consistency, market gap, and strategic alignment.

Step 2 — Regional Market Analysis

A comprehensive assessment of Kenya's healthcare infrastructure, hospital bed capacity growth, imported vs. locally produced IV fluid ratios, and neighboring East African country demand was conducted. This validated the market size and provided the basis for demand forecasting.

Step 3 — Technical Feasibility Evaluation

NPCS conducted a detailed review of sterile manufacturing technology requirements, production process flow, clean room specifications, critical machinery, utilities, and quality control systems aligned with WHO GMP and Kenyan PPB standards.

Step 4 — Financial Modeling & Viability Analysis

A structured financial model was built covering capital expenditure, project cost breakdown, unit production costs, revenue projections at multiple utilization rates, EBITDA analysis, IRR computation, NPV, and payback period estimation.

Step 5 — Implementation Strategy & Roadmap

NPCS provided a phased implementation roadmap covering site selection, regulatory strategy, engineering design, machinery procurement, and commercialization — enabling the client to proceed with clarity and structured decision-making.

SCOPE OF SERVICES DELIVERED

✓ Project Opportunity Identification	✓ Machinery Selection Guidance
✓ Market Demand Assessment	✓ Financial Modeling & Viability Study
✓ Raw Material Availability Study	✓ Project Cost Estimation
✓ Plant Layout & Design Guidance	✓ Implementation Roadmap & Advisory

PROJECT EXECUTION TIMELINE

Timeline	Milestone	Key Activities
Month 1–2	Project Inception	Site identification, regulatory consultation, land acquisition planning
Month 3–4	Detailed Engineering	DPR finalization, machinery specification, plant layout design
Month 5–8	Plant Construction	Civil works, clean room construction, utility installation
Month 9–11	Machinery Installation	Equipment procurement, installation, and commissioning
Month 12–13	Regulatory Filing	GMP certification, pharmaceutical manufacturing license application
Month 14–15	Trial Production	Validation batches, quality testing, product sampling
Month 16+	Commercial Launch	Full-scale production, market entry, hospital supply initiation

⚙ TECHNICAL INSIGHTS — MANUFACTURING PROCESS

IV fluid manufacturing is a highly regulated sterile pharmaceutical process. Below is the step-by-step manufacturing process flow as assessed during NPCS's technical feasibility evaluation:

Phase	Stage	Details
Phase 1	Raw Material Procurement	Pharmaceutical-grade water, sodium chloride, glucose, electrolytes, packaging bags
Phase 2	Water Purification	Multi-stage purification: RO + EDI + distillation to achieve Water for Injection (WFI) standard
Phase 3	Solution Preparation	Preparation of IV formulations in sterile mixing tanks under controlled conditions
Phase 4	Filtration	0.22 micron sterile filtration to remove particulates and microorganisms
Phase 5	Filling & Sealing	Automated aseptic filling into PP/PVC bags or bottles; hermetic sealing
Phase 6	Sterilization	Autoclave sterilization (moist heat) at 121°C to ensure product sterility
Phase 7	Quality Control	Endotoxin testing, sterility testing, pH check, particulate matter analysis
Phase 8	Labelling & Packaging	Automated printing, labelling, secondary packaging, and batch documentation
Phase 9	Warehousing & Distribution	Cold chain management and institutional distribution to hospitals and healthcare facilities

Key Machinery & Technologies

- **Water for Injection (WFI) System:** Multi-effect distillation or reverse osmosis + electrodeionization units
- **Sterile Mixing Vessels:** Jacketed SS316L tanks with CIP/SIP systems
- **Membrane Filtration Units:** 0.22 micron sterile filter cartridge systems
- **Aseptic Filling Lines:** Fully automated bag/bottle filling machines with laminar airflow
- **Autoclave Sterilizers:** Large-volume horizontal autoclaves for terminal sterilization
- **Leak Testing Machines:** Automated seal integrity testing equipment
- **Labelling & Packaging Lines:** High-speed automated identification and secondary packaging systems

FINANCIAL & MARKET ANALYSIS

Global & Regional Market Overview

The global intravenous (IV) fluids market represents one of the most resilient segments in healthcare. Key market indicators assessed by NPCS include:

Global IV Fluids Market Value (2025): USD 13.8 Billion
Projected Market Value (2033): USD 28.2 Billion
Compound Annual Growth Rate (CAGR): ~9.6%
East Africa IV Fluid Demand Growth: Driven by hospital infrastructure expansion and rising disease burden
Import Dependence: Kenya currently imports a significant proportion of its IV fluid requirements — a major gap for local manufacturing

Investment & Financial Projections

The following financial parameters were estimated by NPCS as part of the preliminary feasibility analysis:

Financial Metric	Estimated Range	Remarks
Plant Setup Cost	USD 2.5M – 4.5M	Depending on capacity & automation level
Working Capital	USD 500K – 800K	Initial 6–12 months operational requirement
Expected IRR	18% – 25%+	Subject to output utilization and pricing
Payback Period	4 – 6 Years	Based on conservative demand projections
Gross Margin	35% – 50%	Pharma-grade consumables typically command premium margins
Market Size (2025)	USD 13.8 Billion	Global IV Fluids market valuation
Market Size (2033)	USD 28.2 Billion (est.)	Projected at CAGR ~9.6%

Import Substitution Opportunity

Kenya and neighboring East African nations — including Tanzania, Uganda, Ethiopia, and Rwanda — depend heavily on imported IV fluids from Asia and Europe. Establishing local manufacturing not only reduces import dependency and logistics costs but also improves supply reliability to healthcare institutions, creating a compelling strategic and commercial advantage.

✓RESULTS & OUTCOMES

NPCS's comprehensive feasibility analysis and strategic advisory delivered measurable value to the client across multiple dimensions:

Business Impact & Client Benefits

- **Investment Clarity:** The client gained a clear, data-backed understanding of the total project investment required, expected returns, and time-to-profitability.
- **Sector Entry Strategy:** A well-defined roadmap for entering the pharmaceutical manufacturing sector in Kenya was established.
- **Risk Reduction:** Key financial, technical, and regulatory risks were identified and quantified, enabling proactive mitigation planning.
- **Supply Chain Insight:** The client was equipped with knowledge of raw material sourcing options, packaging supply chains, and utility requirements.
- **Market Positioning:** NPCS's market validation confirmed the significant demand gap for locally manufactured IV fluids in East Africa.
- **Export Potential:** The feasibility study identified adjacent export markets in neighboring East African countries as a medium-term growth opportunity.
- **Strategic Confidence:** The client moved forward with implementation planning backed by a professionally documented feasibility report.

Value Delivered by NPCS

Area	Outcome Delivered
Market Validation	Confirmed strong institutional demand for locally produced IV fluids in East Africa
Technical Blueprint	Defined production process, equipment requirements, and clean room specifications
Financial Modeling	Developed investment estimates, ROI projections, and financial risk parameters
Regulatory Insight	Mapped out PPB Kenya and WHO GMP compliance requirements
Strategic Roadmap	Provided phased implementation plan from ground-breaking to commercial launch

CLIENT TESTIMONIAL

> *Niir Project Consultancy Services provided us with valuable insights and professional support in identifying a viable manufacturing opportunity in the healthcare sector. Their techno-economic feasibility analysis helped us confidently move forward with the IV fluid manufacturing project. The depth of their market knowledge and the quality of their financial analysis exceeded our expectations.*
>
> **— M/s. Niraj Shah** | Entrepreneur, Nairobi, Kenya

WHY CHOOSE NPCS

★ **Proven Industrial Expertise**	30+ years delivering bankable feasibility reports across 50+ countries in multiple sectors.
★ **Global Market Intelligence**	Deep access to international market data, price trends, and demand forecasts.
★ **Data-Driven Feasibility**	Financial modeling and techno-economic analysis grounded in real industry benchmarks.
★ **End-to-End Project Support**	From opportunity identification to implementation planning — one comprehensive partner.
★ **Risk Mitigation Approach**	Identifies and quantifies financial, technical, and regulatory risks upfront.
★ **Sector Depth**	Covers chemicals, pharmaceuticals, food processing, textiles, energy, and 100+ other industries.

CONCLUSION

The M/s. Niraj Shah case study demonstrates how NPCS's structured consultancy approach — combining rigorous market analysis, technical expertise, and financial modeling — enables investors to make confident, well-informed manufacturing investment decisions.

For M/s. Niraj Shah, NPCS identified IV fluid manufacturing as a strategically aligned, financially viable opportunity within Kenya's growing healthcare ecosystem. The project offers long-term revenue stability, import substitution potential, and regional export scalability — all backed by comprehensive feasibility intelligence.

By partnering with NPCS, the client transformed an investment concept into a structured, bankable industrial project — with full clarity on capital requirements, market demand, technical execution, and regulatory pathway.

Strategic Value Delivered

- Reduced investment uncertainty through data-driven feasibility analysis
- Accelerated decision-making with a structured implementation roadmap
- Positioned the client for long-term success in East Africa's growing pharmaceutical market
- Enabled potential access to regional export markets across East and Central Africa