Business Proposal for the Commercial Deployment of the Electronic Compact Medical Testing System (ECMTS)

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Date: October 2025

Executive Summary

The **Electronic Compact Medical Testing System (ECMTS)** is an **indigenous, multi-parameter diagnostic system** developed by the *Electronic Development Institute (ELDI)* under the *National Agency for Science and Engineering Infrastructure (NASENI)*.
It integrates vital sign measurement and body composition analysis into one compact, IoT-enabled device, providing a cost-effective alternative to imported diagnostic tools.

Currently, Nigerian hospitals rely heavily on imported diagnostic devices, with total acquisition costs ranging from **₦900,000 to ₦1,200,000** per facility. ECMTS performs the same functions—including **blood pressure, temperature (contact/non-contact), pulse rate, height, weight, BMI, body fat %, bone mass, water %, and calorie estimation**—at a local production cost of **₦620,000**, representing an estimated **39.09% cost reduction**.

With the inclusion of a **Wi-Fi and Bluetooth-enabled ESP32 microcontroller**, a **7-inch Android tablet interface**, and **cloud-based data storage**, ECMTS enables doctors to remotely view and manage patient results in real time. This innovation directly supports the **Federal Government's National Science, Technology, and Innovation Roadmap (NSTIR 2030)** and the **Sustainable Development Goals (SDGs) 3 and 9**.

The goal of this business proposal is to seek funding and strategic partnerships for **mass production, national deployment, and integration** of ECMTS across Nigerian hospitals, mobile clinics, and rural healthcare centers.

*Figure 1:**The ECMTS integrated diagnostic system (prototype view).***

1. Problem Statement

Nigeria's healthcare sector faces persistent challenges:

- **Over-dependence on imported diagnostic devices** leading to high costs and maintenance difficulties.
- **Fragmented equipment systems**, requiring multiple devices to conduct basic tests.
- **Limited access to diagnostic tools** in rural and low-income communities.
- **Poor data continuity** and lack of digital health integration between patients and medical practitioners.

Over **60% of primary health centers** in Nigeria lack the equipment needed for basic diagnostic screening. Imported devices are not only costly but often incompatible with local maintenance systems, resulting in equipment downtime and patient neglect.

The ECMTS addresses these challenges by providing a **locally manufactured, solar-compatible, IoT-based diagnostic device** designed for both institutional and individual use.

2. The Solution — The ECMTS System

2.1 Product Overview

The **ECMTS** is a compact diagnostic system integrating:

- **Primary sensors:** Blood Pressure, Temperature (Contact & Non-contact), Pulse Rate (Dual mode), Weight, and Height.
- **Derived analytics:** BMI, Body Fat %, Total Body Water %, Bone Mass, and Caloric Estimate.
- **Connectivity:** Bluetooth for device–tablet communication; Wi-Fi/4G for cloud data upload.
- **User Interface:** Proprietary Android application with patient record entry, calibration settings, and result display.
- **Power Supply:** 12V DC (solar-compatible).

2.2 Competitive Advantage

Feature	Imported Systems	ECMTS
Cost	₦900,000–₦1,200,000	₦520,000
Power Requirement	AC mains only	12V DC (solar-ready)
Connectivity	Limited or None	Bluetooth + Wi-Fi/Cloud
Integration	Single-function devices	Multi-parameter integrated system
Support	Foreign	Local (ELDI / NASENI)
Maintenance	High cost, imported parts	Local service and parts
Usability	Hospital-only	Hospital + Mobile + Personal use

Table 1

Figure 2: **ECMTS Modular Components**

Caption: (a) height sensor, (b) weighing platform, (c) display/printer section, and (d) tablet interface.

3. Market Analysis

3.1 Target Market

The ECMTS addresses three primary markets:

1. **Hospitals and Clinics:** Over 10,000 hospitals and diagnostic centers in Nigeria.
2. **Rural and Mobile Health Units:** Estimated 8,000 community and primary healthcare centers.

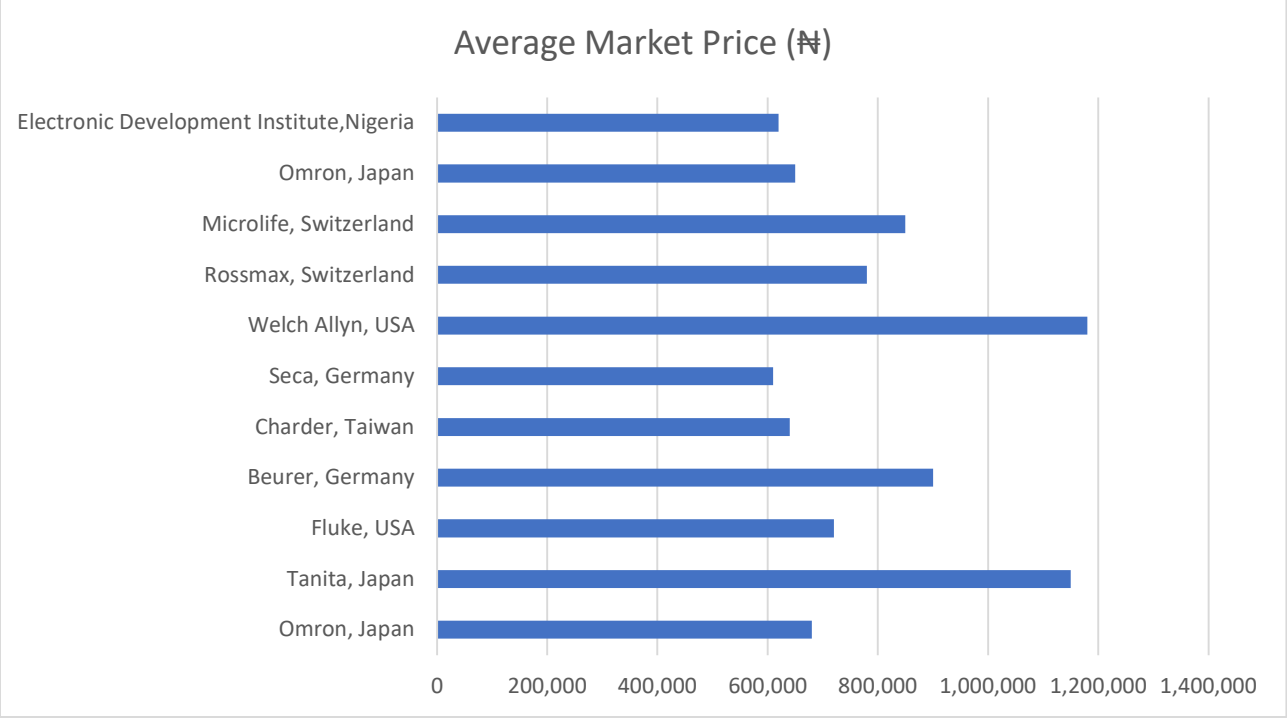
3. **Personal/Individual Use:** Growing middle-class segment investing in home health devices.

3.2 Market Size

According to the *Nigeria Medical Equipment Market Report (2024)*, the diagnostic equipment market is valued at **₦120 billion annually**, growing at **7.2% CAGR**. With local manufacturing, ECMTS could capture at least **2–3% of the market** in its first two years, representing sales of over **₦2.4–₦3.6 billion**.

3.3 Competitor Analysis

Competitors include imported brands such as Omron, Tanita, Beurer, and Welch Allyn. However, none offer a fully integrated, IoT-based diagnostic system optimized for low-resource environments and priced below ₦650,000.



Comparative Cost Chart]

Caption: Bar chart showing cost comparison — imported systems ≈ ₦900,000 vs ECMTS ₦620,000 (approx. 39.09% reduction).

4. Implementation Plan

4.1 Production Strategy

- **Phase 1 (Pilot Manufacturing):** 20 units to be produced at ELDI's Awka facility using local assembly and imported sensors.
- **Phase 2 (Scale-up):** Establish regional assembly lines in Lagos, Abuja, Enugu, and Benin City for 5,000–10,000 units per year.
- **Phase 3 (Export Readiness):** Expand to West African markets under AfCFTA trade agreements.

4.2 Distribution Channels

- Direct sales to hospitals and government health agencies.
- Retail distribution through medical equipment suppliers.
- E-commerce platform for individual sales.
- Public–private partnerships for deployment in rural healthcare programs.

4.3 Technical Support

Local service centers will provide maintenance, calibration, and software updates. NASENI's existing infrastructure ensures long-term sustainability.

5. Financial Projections

Description	Unit Cost (₦)	Selling Price (₦)	Gross Margin
Production (Electronics + Sensors + Thermal Printer + Enclosure)	260,000	620,000	29.80%
Tablet Integration & App Licensing	155,000	—	—
Packaging, Logistics & Marketing	20,000	—	—
Total Production Cost (per unit)	**435,000**	**620,000**	**185,000profit/unit**

Figure 3

Projected Sales (Year 1):
500 units × ₦620,000 = ₦310,000,000 gross revenue
Net profit (Year 1): ₦92,500,000
Year 2–3 Growth Projection: Expansion to 3,000 units annually (₦1.86 billion revenue potential).

6. Socioeconomic Impact

- **Job Creation:** Direct employment for over 50 engineers, technicians, and marketers.
- **Technology Transfer:** Strengthened local manufacturing capability through NASENI and industry partnerships.
- **Healthcare Inclusion:** Deployment to over 1,000 underserved communities through mobile clinics.
- **Data Infrastructure:** Contributes to the creation of Nigeria's national digital health repository.
- **Import Substitution:** Reduces foreign exchange dependency by an estimated ₦5 billion annually.

Figure 4

Figure 5

Figure 6

ECMTS in Operation]

Caption: Device in use during a clinical screening session, showing results on the tablet UI.

7. Sustainability and Expansion

The ECMTS is designed with long-term sustainability in mind:

- **Technical Sustainability:** Modular design allows easy sensor upgrades and software updates.
- **Economic Sustainability:** Competitive pricing ensures rapid adoption and profitability.
- **Environmental Sustainability:** Low power consumption and solar compatibility.
- **Policy Alignment:** Supports national health digitization and indigenous innovation mandates.

Future upgrades will incorporate AI-based health analytics, glucose monitoring, and oxygen saturation measurement.

8. Funding Requirements

To commence full-scale production and commercialization, the project requires **₦250 million** in funding, distributed as follows:

Budget Item	Estimated Cost (₦ Million)
Equipment Procurement and Assembly Line Setup	80
Sensor and Component Bulk Purchase	50
Software Refinement and Cloud Infrastructure	30
Marketing and Distribution	40
Working Capital and Staff Development	50

Total	250

Figure 4

Investors or government partners are expected to recover their initial investment within **24 months**, with a **projected ROI of 35–45%**.

9. Conclusion

The **Electronic Compact Medical Testing System (ECMTS)** represents a revolutionary advancement in Nigeria's pursuit of **accessible, affordable, and digitalized healthcare**.
It combines technological innovation with local manufacturing, economic sustainability, and national policy relevance. With proper funding and government and private sector collaboration, ECMTS can become the benchmark for indigenous medical technology across Africa.

Investing in ECMTS means investing in Nigeria's health, technology, and future.

Annexes / Figures

- *Figure 1: ECMTS Prototype (front view)*
- *Figure 2: Modular Components Layout*
- *Figure 3: Financial Projections*

- *Figure 4 - 6: ECMTS in Operation (Demonstration)*
- *Table 1: Cost Comparison of Imported Devices vs ECMTS*