DIGITAL BALANCE

harmony between technology and human needs

Digital Balance Pty Ltd.

Transforming the Digital Health Space for Africa

10 point plan

The first task is to conduct an ICT environmental scan of the Health sector throughout the country i.e

- ICT infrastructure,
- ICT services,
- ICT devices,
- Connectivity at hospitals and clinics,
- electricity sources,
- ICT training of nurses and health workforce,
- cybersecurity,
- network analysis.

Key planned projects

1. AI-Based Chronic Medication Adherence & Inventory Tracking System

Challenge Addressed: Poor medication adherence, fragmented dispensing records, and over-dispensing to chronic patients (e.g., HIV, diabetes, hypertension)

Solution: A centralized AI-powered system that **tracks medication issued to patients across all health facilities**, ensures proper monthly adherence, and prevents patients from receiving duplicate or excess medication if they travel or visit multiple clinics.

Key Features:

- **Unified Digital Medication Record**
  Each patient has a centralized medication profile linked to their National Health ID, accessible across all public and private health facilities.

- **Real-Time Stock Logging**
  Every time medication is dispensed, the quantity and date are recorded in the system—automatically updating the patient's medication balance.

- **AI-Powered Adherence & Stock Alerts**
  - Predicts when medication should run out based on dosage
  - Sends alerts to patients and health workers if pickups are missed or duplicated
  - Flags patients trying to access additional medication within the same cycle

- **Patient Medication Balance Tracker**
  Patients can see how many days of medication they have left through:
  - A mobile app (for smartphones)
  - USSD (*123#) for feature phones
  - SMS reminders for refill days

- **Health Worker Dashboard**
  Allows clinics to:
  - Check when and where a patient last received medication
  - Avoid issuing extra tablets due to incomplete or duplicate records
  - Identify medication defaulters or hoarding patterns

Requirements:

- **Integration with a national electronic health records system**
- Health facility access to tablets or computers for updating records
- Low-bandwidth and offline capability for rural clinics
- Unique Patient ID (e.g., National ID)
- Support from the Ministry of Health and pharmacy councils
- Role-based access for data security and privacy

2. AI-Powered Rural Telemedicine System

Challenge Addressed: Limited access to healthcare in rural areas

Fragmented Patient Data

- Scattered medical records across clinics and hospitals, with no central database for renal patients.

Solution: Develop a mobile-based AI telemedicine platform that connects rural patients with urban doctors using low-bandwidth video, voice, and text-based consultations.

Key Features:

- AI chatbot for preliminary diagnosis in local languages
- Offline symptom checker and triage
- Referral engine to direct critical cases to nearest functional facility

Requirements:

- Solar-powered mobile health units with satellite internet
- Partnership with mobile network operators
- Integration with local health worker networks for on-ground support

3. AI-Driven Supply Chain Optimisation Platform

Challenge Addressed: Lack of essential medicines and medical supplies

Solution: Intelligent stock prediction and logistics platform to prevent stock-outs

Key Features:

- Predictive analytics for medicine demand forecasting
- Real-time inventory tracking using QR/barcodes
- AI-recommended procurement and distribution schedules

Requirements:

- Digital inventory system at clinics and pharmacies
- Centralised national health data integration
- Buy-in from all key stakeholders

4. AI Solution for Dialysis Identification & Monitoring for Zimbabwean Patients

Common Problems in Dialysis Management in Zimbabwe

Limited Access to Diagnostic Services

- Rural and peri-urban areas lack access to nephrologists and advanced diagnostic tools.
- Many patients are diagnosed at a late stage of kidney failure.

Inconsistent Patient Monitoring

- Lack of continuous monitoring tools leads to poor tracking of patient vitals and treatment adherence.
- Manual records are prone to loss, misinterpretation, and delays.

5. AI for Health Workforce Management & Training

Challenge Addressed: Shortage of healthcare professionals and skill gaps

Solution: AI-based training assistant and workforce allocation tool

Key Features:

- Personalised training modules using AR/VR for nurses and community health workers
- AI-based analytics to track competencies and identify training needs
- Smart deployment system to optimise staff allocation based on disease trends and population needs

Requirements:

- Government-endorsed health curriculum digitized
- Training devices (tablets/smartphones) with offline capability
- Partnership with local nursing schools and MoHCC

6. AI Surveillance & Predictive Analytics for Disease Outbreaks

Challenge Addressed: High prevalence of infectious diseases

Solution: A national AI surveillance system for early detection of HIV, TB, and malaria outbreaks

Key Features:

- Data aggregation from clinics, mobile apps, and community reports
- Predictive analytics using weather, mobility, and historical health data
- Automated alerts and mitigation suggestions for health officials

Requirements:

- Central data repository with secure access
- Local data science team to train models
- Health worker training on digital disease reporting

7. AI-Based Maternal & Child Health (MCH) Companion App

Challenge Addressed: High maternal and child mortality

Solution: Mobile AI companion for expecting mothers and caregivers

Key Features:

- Personalized pregnancy tracking and advice (in Shona/Ndebele)
- Reminders for antenatal visits and vaccinations
- AI chatbot for common maternal health queries
- Emergency transport coordination (linked to local transport providers)

Requirements:

- Community health worker support for onboarding users
- Integration with local clinics for appointment tracking
- Public-private partnerships with maternal health NGOs

8. AI-Enabled Financial Risk Protection Platform

Challenge Addressed: Financial constraints and inequality

Solution: AI tool to recommend and manage micro-health insurance and subsidy schemes

Key Features:

- Eligibility assessment using household income and demographics
- AI-matching to best-fit government or NGO subsidy programs
- Fraud detection and resource optimization

Requirements:

- Mobile money integration (EcoCash, OneMoney)
- Collaboration with NSSA and Ministry of Public Service
- Data privacy and digital ID verification system

9. Smart Facility Condition Monitoring with AI + IoT

Challenge Addressed: Eroded infrastructure

Solution: IoT + AI system for remote monitoring of hospital infrastructure (e.g., equipment, water, electricity)

Key Features:

- Sensors to track infrastructure health (power, sanitation, equipment usage)
- AI to prioritize maintenance and repairs
- Dashboard for health facility administrators and district managers

Requirements:

- IoT sensors with long-life batteries and GSM connectivity
- Maintenance response teams at district level
- Integration with Ministry of Health's infrastructure unit

10.Proposed AI-Based Solutions

A. AI-Driven Early Identification System

- Use machine learning models trained on local patient data to:
  - Predict risk of kidney disease progression.
  - Flag early signs based on blood test results, blood pressure trends, and patient history.
- Integrate into community clinics and mobile apps for local nurses and doctors.

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B. AI-Powered Remote Monitoring

- Wearable or mobile device integration to track:
  - Blood pressure, fluid retention, glucose levels.
  - Symptoms like fatigue, swelling, nausea.
- AI flags anomalies and sends alerts to caregivers and doctors.

C. Centralized Patient Registry with AI Analytics

- Develop a cloud-based Electronic Health Record (EHR) system with:
  - AI analytics for trend analysis and personalized treatment plans.
  - National dialysis database for patient tracking, resource allocation, and forecasting.

D. Chatbot-Based Patient Support

- Deploy WhatsApp-based or USSD-compatible AI chatbots that:
  - Educate patients on renal diet, warning signs, and medication adherence.
  - Send reminders for appointments and medication.
  - Collect daily symptom check-ins.

E. AI for Facility Resource Optimization

- Predictive algorithms to:
  - Forecast demand for dialysis slots, consumables, and transport services.
  - Match patient need to nearest available facility.

F. Image Recognition for Diagnostics

- AI models trained on ultrasound or CT scans to assist in:
  - Kidney morphology analysis.
  - Identification of obstructions or atrophy.
- Support diagnosis in facilities without specialist radiologists.

G. Decision Support System for Doctors

- AI assistant to:
  - Recommend dialysis modalities (HD/PD).
  - Suggest treatment adjustments based on lab results.
  - Alert for contraindications and drug interactions.

Implementation Notes

- **Phased Rollout**: Start with pilot in urban-rural hybrid settings like Gweru or Mutare.
- **Public-Private Partnerships**: Collaborate with local health ministries, NGOs, and telecoms for infrastructure.
- **Data Privacy Compliance**: Ensure all AI tools comply with Zimbabwe's Data Protection Act and health regulations.
- **Capacity Building**: Train health workers in AI tool usage and interpretation of outputs.

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