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Keytric – The Smart Lock That Saves Energy

Name: **Team PROTRONICS**

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Proposed Solution

Keytric is a hardware-based smart door lock system designed to eliminate energy waste and improve electrical safety in Nigerian homes. Using RF communication, the system cuts off power to selected appliances automatically when the door is locked and restores power when unlocked. It integrates into traditional lock handles and requires no software or microcontrollers, making it affordable, intuitive, and maintenance-free.

Technical Design

- RF transmitter embedded in the door handle sends ON/OFF signals.
- RF receiver circuit with a relay controls power to selected appliances.
- Ultra-low power circuit design powered by coin-cell batteries with a 3-year lifespan.
- No need for Wi-Fi, apps, or reprogramming — all hardware-based logic.

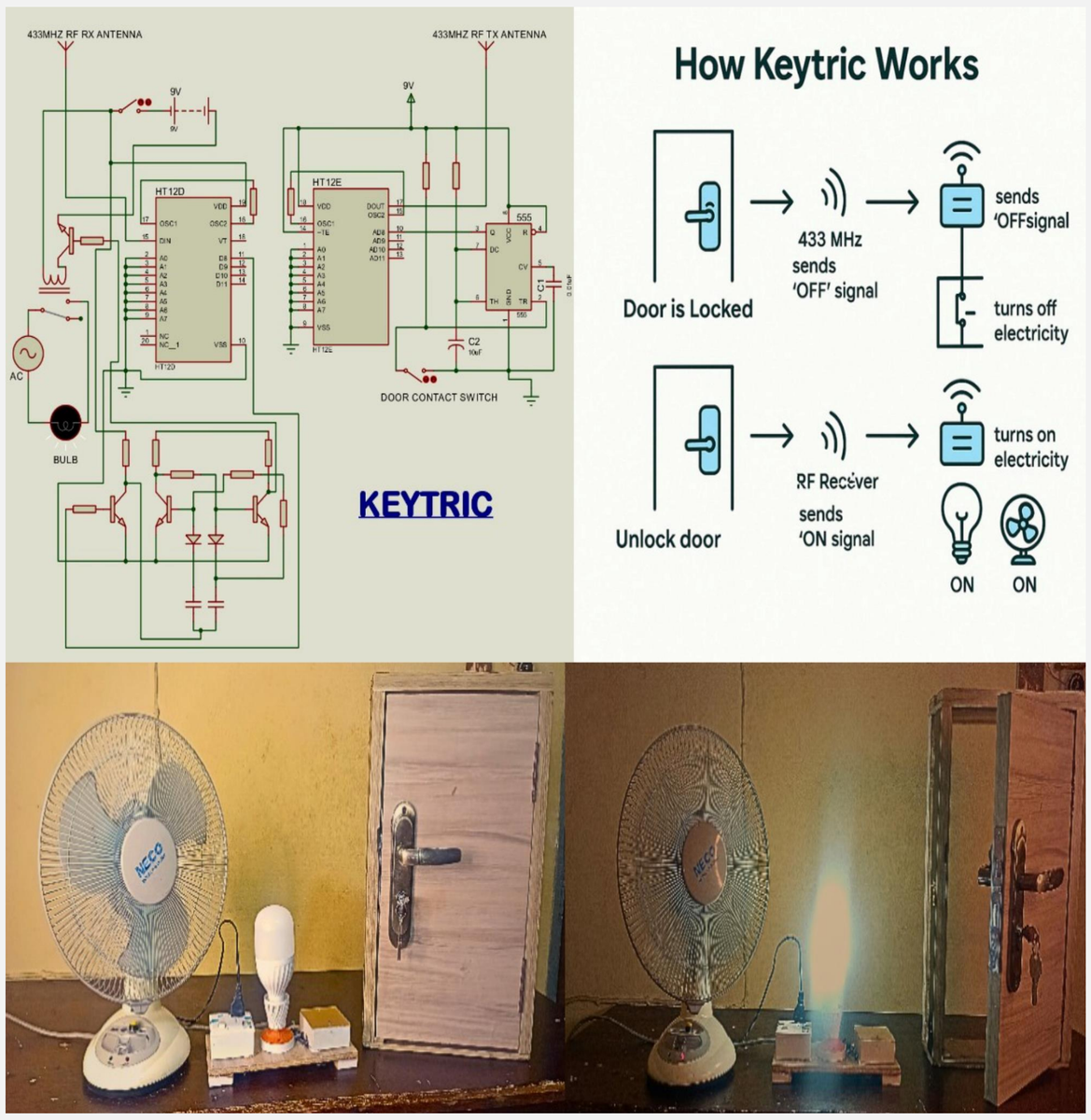

Fig. 1: Prototype Overview: Circuit, Function & Result

Economic feasibility/Proposed Business Model

Business Model: Direct sales to customers and bulk distribution to landlords, property managers, and hostels.

Revenue Strategy: Selling each unit at ₦25,000 with a 50% profit margin ensures sustainability and reinvestment capacity.

Affordability: A ₦25,000 one-time cost replaces the need for expensive smart home systems costing ₦150,000+.

Savings Impact: Users can save up to 30% on electricity bills (₦3,000–₦7,000/month), achieving ROI in under 6 months.

Future Plan: Partner with estate developers and prepaid meter vendors to include Keytric as a standard feature in new rentals.

Timeline for developing prototype/trial

Aug – Sep 2024: Conceptual Design & Component Sourcing

Oct 2024: First Working Prototype & Bench Testing

Dec 2024 – Mar 2025: Field Trials Conducted in Selected Rental Lodges Around the University of Port Harcourt

April 2025: Final Prototype Optimization, Packaging & Training Manual Development.

Budget & Target User/Market/Scale

- **Target Users**: Students, low- and middle-income tenants, landlords, and hostels.
- **Market Regions**: Urban areas with prepaid meters (e.g. Port Harcourt, Warri, Uyo, Benin).
- **Market Size**: Estimated over 5 million households in Nigeria with prepaid meters and regular consumption.
- **Selling Price**: #25,000 per unit
- User Value: Saves up to 30% in electricity costs.
- **Scalability**: Easily mass-produced with affordable, off-the-shelf hardware.

References

[1] National Bureau of Statistics (2024). *Nigeria Residential Energy Demand-Side Survey Report*.
[2] PM News (2022). *Federal Fire Service: Electrical faults caused 636 fires in 2021*.

Acknowledgements

We thank the TIEC team and University of Port Harcourt for their support, and appreciate the guidance of our mentors and feedback from the local community during testing