Gold Vending Machine (Gold ATM)

1. Overview

The Gold ATM is an advanced **self-service vending system** for secure, automated sale of certified gold coins and bars.
It combines **bank-grade hardware security**, **precise robotic handling**, and **smart digital identity verification** to deliver a fully autonomous customer experience—available 24 hours a day.

2. Key Specifications

Category	Description
Display & User Interface	55-inch industrial-grade **touch screen** with multi-language (English / Persian) UI and video guidance.
ID Verification & OCR	Integrated **ID scanner** capable of reading national ID cards, passports, and smart cards with **OCR (English & Persian)** for automatic data extraction.
Face Detection & Recognition	AI-based module detects and recognizes returning customers; enables **automatic profile login** after first ID registration.
Two-Factor Authentication	**SMS verification** through secure gateway; prevents unauthorized use.
Payment System	Certified **POS terminal** supporting bank cards; fully integrated with Iranian payment networks.
Weight Verification	High-precision **digital scale (0.01 g accuracy)**
Product Capacity	Up to **20 product types** (various coins and small bars < 100 g). Each tray holds ≈ 50 units → **max 1 000 items** total.
Safety & Security	Reinforced **metal safe-box structure**, automatic locks, **6 internal HD security cameras**, intrusion and tamper alarms.
Traceability & Anti-Fraud	Every item carries a **QR code** linked to the backend database and verified before delivery.
Accounting & Management	Lightweight built-in **accounting and inventory system** showing real-time sales, remaining stock, and automatic gold-price updates.
Connectivity	Ethernet / 4G / Wi-Fi communication with secure cloud synchronization and remote monitoring dashboard.
Power Backup	Internal UPS for safe operation during short power outages.
Dimensions	Approx. W 80 cm × D 125 cm × H 180 cm (customizable).
Construction	Powder-coated **sheet-metal cabinet**, gold-themed LED illumination.

3. System Architecture Summary

- **Core Control Board:** custom microcontroller with modular I/O for motion, sensors, and communication.
- **Motion System:** 4-axis precision drive controlling robotic picker for gold cards; redundant sensors ensure positioning accuracy.
- **Sensor Network:** vacuum pressure sensors, proximity sensors, end-stops, and safety switches monitored in real time.
- **Human Interface Module:** industrial PC running the HMI, OCR/face modules, and backend communication.
- **Backend Server:** manages customer profiles, purchase history, SMS gateway, and admin panel access.

4. Software Features

1. **Customer Workflow**
    - ID scan → OCR → face capture → SMS code login
    - Product catalog display with live pricing
    - POS payment and confirmation
    - Automated delivery and receipt printing
2. **Smart Profile System**
    - First-time users register via ID + face
    - Next visit: instant recognition → auto login
3. **Admin Dashboard (Web & Mobile)**
    - Multi-level access (operator / owner / manufacturer)
    - Live inventory and sales reports
    - Error notifications via SMS or Telegram
    - Remote lock/unlock and parameter adjustment
4. **Accounting & Warehouse Modules**
    - Transaction log with buyer info, product type, weight, unit price, payment value
    - Inventory tracking and re-stock alerts
    - Exportable sales and balance reports

5. Security and Reliability

- **Physical Security:** steel-grade safe structure with electronic locks and alarm relay.
- **Cyber Security:** encrypted communication, local data backup, and controlled remote access.
- **Redundancy:** critical sensors and vacuum lines are duplicated for fail-safe operation.
- **Cameras:** six independent video feeds record customer and mechanical zones.

6. Maintenance & Support

- 12-month hardware warranty
- Remote diagnostics and firmware updates
- Local spare-part availability and on-site service on request



Gold Vending Machine Design



Gold Vending Machine



Gold Vending Machine



Gold Vending Machine



Gold Vending Machine

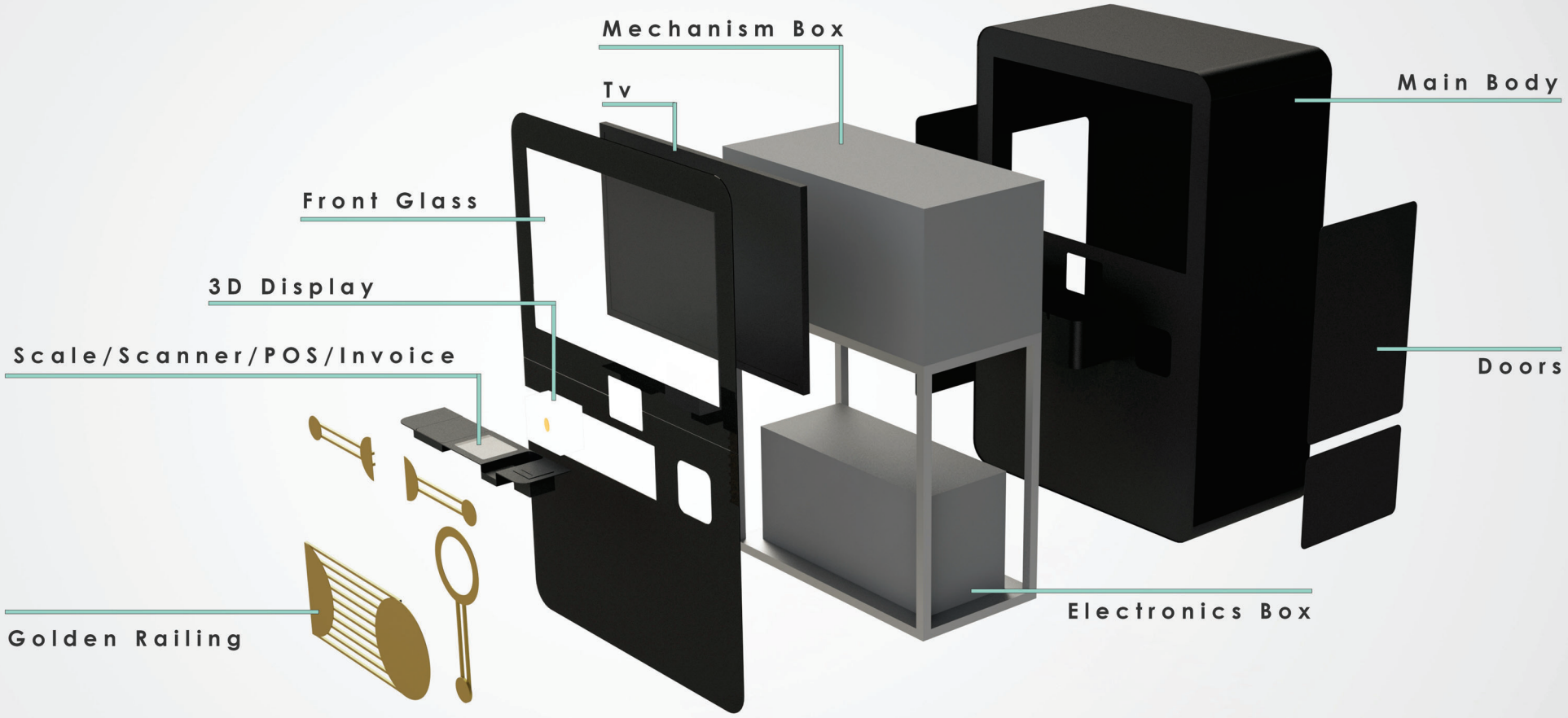


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Scale
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