WOFFY.AI

Your AI Companion

Comprehensive Project Report

Version 2.0 - Enhanced Edition

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1. Executive Summary

Woffy.ai is a next-generation AI-powered robotic companion designed to bring genuine emotional connection, intelligent interaction, and smart home integration into households worldwide. Unlike cheap toy alternatives flooding the market, Woffy represents a premium, truly intelligent companion that learns, adapts, and forms meaningful bonds with its owners.

One-Line Value Proposition

Woffy is a moving AI companion that combines emotional bonding, smart home control, and security patrol in one product.

Key Differentiators

- Real AI with genuine learning capabilities — not pre-programmed responses
- OLED Gaze technology displaying 50+ unique emotional states
- Two distinct product lines: Cloud Edition (comfort) and Titan Edition (adventure)
- Deep smart home integration via INIYAL voice assistant platform
- Built by Onwords Smart Solutions — 400+ smart home installations, proven track record
- Dual controller design for safety and low latency response
- Offline promise: Core features work even without internet (movement safety, basic interaction, local smart home control)

Product Editions

Aspect	Cloud Edition	Titan Edition
Tagline	Soft, Plush, Warm	Metal, Rugged, Cool
Environment	Indoor	Indoor + Outdoor
Shell Material	Pastel Fur / Plush	Brushed Metal / Polymer
Primary Use	Anxiety Relief, Cuddly Companion	Exploration, Durable Adventure
Target Users	Kids, Elderly, Anxiety Support	Tech Enthusiasts, Outdoor Users
Priority	Phase 1 — Primary Focus	Phase 2 — Future Development

2. Target Personas & Jobs to Be Done

Understanding our users deeply is critical to product success. Below are our primary personas with their specific needs and how Woffy addresses them.

2.1 Primary Personas

Kids (Ages 5-15)

- Playful buddy for entertainment and companionship
- Bedtime routines — story time, calming music, gradual dim lights
- Study timer and homework encouragement
- Safe interaction mode with parental controls
- Educational games and curiosity-driven exploration

Adults

- Anxiety relief through interaction and companionship
- Habit coach — exercise reminders, hydration alerts, routine building
- Desk companion for remote workers
- Smart home control voice interface throughout the house
- Entertainment and stress relief after work

Seniors

- Daily companionship to reduce loneliness
- Medication and appointment reminders
- Simple calling support to family members
- Night patrol awareness for peace of mind
- Fall detection awareness (future feature)

Smart Home Owners

- Roaming voice hub to trigger scenes and controls anywhere in the house
- Mobile control interface that follows you
- Unified ecosystem control through natural conversation
- Security monitoring when away

2.2 Success Metrics

Metric	Target
Daily Usage Minutes	> 45 minutes average
7-Day Retention	> 70%
NPS (Net Promoter Score)	> 50
"Sad if Removed" Score	> 60%
Feature Adoption (Smart Home)	> 40% weekly usage
Feature Adoption (Guard Mode)	> 25% weekly usage

3. Smart Home Control Capability

Woffy serves as a mobile voice hub, enabling seamless smart home control throughout the house. This is a key differentiator powered by Onwords' INIYAL ecosystem.

3.1 Woffy as Mobile Voice Hub

- Controls lights, fans, AC, curtains, plugs, gates, and scenes
- Room-aware control — triggers different scenes based on Woffy's location
- Natural language commands: "Woffy, dim the lights" or "Woffy, I'm going to bed"
- Voice confirmation and status updates

3.2 Routine Automation

Routine	Actions Triggered
Good Morning	Open curtains, adjust AC, play news, set lights to bright
Movie Time	Dim lights, close curtains, set AC to comfort, enable DND mode
Night Lock	Lock all doors, arm security, dim all lights, enable patrol mode
Away Mode	Random light patterns, enable full surveillance, send alerts
Study Time	Optimal lighting, block entertainment, start focus timer

3.3 Local-First Control

- LAN control for critical actions — works even if internet is down
- Emergency commands processed locally with < 150ms latency
- Cloud sync for logging and advanced features when available
- Graceful degradation — core functions never fail

3.4 Integration Roadmap

Phase	Integration	Timeline
Phase 1	Onwords ecosystem via INIYAL API	Launch
Phase 2	Matter protocol support	6 months post-launch
Phase 3	Zigbee direct compatibility	12 months post-launch
Phase 4	Third-party integrations (Google, Alexa)	18 months post-launch

4. Home Security: Guard Mode & Surveillance

4.1 Guard Mode

Woffy can act as a mobile security patrol, providing peace of mind through active monitoring.

Patrol Features

- Scheduled patrol routes with customizable no-go zones
- Event detection: motion, unexpected human presence, repeated sound spikes
- Door open triggers when integrated with smart door sensors
- Night guard profile: slower speed, silent movement, minimal lights, maximum detection

Actions on Event Detection

1. Turn on all lights in the zone
2. Trigger siren or voice warning ("Alert: Movement detected in living room")
3. Notify owner via app with timestamp and zone location
4. Optional escalation to family emergency contacts
5. Record video clip of event (with user consent)

4.2 Surveillance Mode

Remote Check Features

- User can remotely drive Woffy to inspect any location in the home
- Live view clearly indicated with LED status
- Two-way audio communication

Recording Rules

- Local recording option (SD card storage)
- Cloud recording only if user explicitly opts in
- Easy delete and complete data wipe controls
- Automatic deletion after configurable retention period

4.3 Privacy Rules (Critical)

Privacy is non-negotiable. These rules are enforced at the firmware level:

- No stealth recording — physical indicators always show when mic/camera are active
- LED ring clearly indicates recording status (Red = Recording, Blue = Live View)
- One-tap disable from app for all surveillance features
- Kid Mode automatically blocks all surveillance features by default
- Guests can be notified of Woffy's presence via optional "Guest Mode"
- All data encrypted at rest and in transit

5. AI Architecture: What "Real AI" Means

Woffy features genuine AI capabilities — not pre-recorded responses. Here's how intelligence is distributed between on-device and cloud processing.

5.1 On-Device AI (Raspberry Pi 4/5)

- Wake word detection ("Hey Woffy")
- Voice activity detection (VAD)
- Basic command recognition for offline operation
- Reflex safety — obstacle avoidance, cliff detection, docking logic
- Personality state machine and mood transitions
- Local short-term memory cache (recent interactions)
- Face detection and recognition (familiar vs stranger)

5.2 Cloud AI (via INIYAL API)

- Long conversation intelligence with context retention
- Long-term memory and personalization learning
- Continuous skill updates and new capabilities
- Vision-heavy features (object identification, scene understanding)
- Natural language understanding for complex queries
- Multi-language support

5.3 Performance Targets

Metric	Target
Reflex actions (obstacle stop)	< 150ms
Voice response (simple commands)	< 1.5 seconds
Voice response (complex queries)	< 3 seconds
Face recognition	< 500ms
Emotion state transition	< 100ms

5.4 Safety Layer

- Safe response policy for Kids Mode — filtered content, age-appropriate language
- Hallucination control — uncertainty responses when confidence is low
- Guardrails for commands — won't execute potentially dangerous smart home actions without confirmation
- Parental override for all AI features

6. Mobility Design Philosophy

6.1 V1: Wheel-Based Mobility

The initial release uses a 4-wheel drive system with the following rationale:

- Reliability — proven technology with predictable behavior
- Cost efficiency — significantly lower BOM vs articulated legs
- Time to market — faster development and testing cycle
- Maintenance — easily replaceable wheels and motors
- Safety — lower center of gravity, stable movement

6.2 Future: Articulated Movement (If Funding Allows)

- Richer gestures for enhanced emotional expression
- Ability to navigate stairs and uneven surfaces
- More pet-like movement patterns
- Premium product differentiation

6.3 Modular Design Strategy

Key Design Choice: The chassis and electronics are designed to be modular so the movement module can evolve without rewriting the entire platform.

- Standardized mounting points for different mobility modules
- Abstracted motor control interface
- Swappable wheel assemblies for terrain optimization
- Future-proof connector design for leg modules

7. Market Opportunity

7.1 Global Market Size

The companion robot market is experiencing explosive growth, driven by increasing urbanization, aging populations, mental health awareness, and demand for smart home integration.

Market Segment	Projected Value (2028)
Global Companion Robot Market	$34.5 Billion USD
Consumer Robotics (Asia-Pacific)	$12.8 Billion USD
Emotional Support Tech Market	$8.2 Billion USD
Smart Home Integration Devices	$182 Billion USD

7.2 Competitive Landscape

Competitor	Price Range	Strengths	Weaknesses
Sony Aibo	$2,900 USD	Premium build, advanced AI	Extremely expensive
EMO by Living.AI	$250-350 USD	Desktop companion	Not mobile, limited
Anki Vector	$299 (discontinued)	Good AI, charming	Company bankrupt
Cheap "Wuffy" Toys	$15-40 USD	Low price	No real AI, scam
Woffy.ai (Ours)	₹29,000-38,000	Real AI, smart home, mobile	New entrant

8. Technical Architecture

8.1 Dual Controller Architecture

Woffy employs a sophisticated dual-controller architecture that separates high-level intelligence from real-time motor control.

Component	Raspberry Pi 4/5	ESP32
Role	Main Brain — High-level	Reflexes — Real-time
Responsibilities	AI/ML, Vision, Navigation, INIYAL	Motor PWM, Sensors, Safety
Communication	UART, WiFi/MQTT	UART to Pi
OS	Raspberry Pi OS Lite	FreeRTOS / Arduino

Why Dual Controller?

- Fault Isolation: ESP32 can emergency stop even if Pi crashes
- Real-time Performance: Motor control needs consistent timing (20kHz PWM)
- Processing Distribution: Heavy AI on Pi, light control on ESP32
- Modularity: Can upgrade either controller independently

8.2 Software Modules

Personality Engine

- Needs System: Energy, Attention, Play, Curiosity — drives autonomous behavior
- Emotion Engine: Processes events → determines emotional state → triggers expressions
- Behavior State Machine: Idle, Social, Play, Navigate, Patrol, Sleep modes
- Learning Module: Adapts to owner patterns, preferences, schedules

Vision System

- Face Detection: OpenCV Haar cascades or DNN for real-time detection
- Face Recognition: Identifies owner vs strangers
- Object Detection: YOLOv8 nano for toys, obstacles, charging dock

Navigation System

- Odometry: Encoder-based distance and position tracking
- SLAM: Hector SLAM for indoor mapping (with LiDAR)
- Path Planning: A* algorithms for navigation

9. Traction & Validation Plan

This is our systematic approach to de-risking the product before full production.

9.1 User Research Phase

Activity	Target	Timeline
User Interviews	30-50 across all personas	Month 1-2
Home Pilots	10 homes, 2 weeks each	Month 3-4
Waitlist Signups	1,000 before preorder	Month 4-6
Preorder Validation	Small deposit program	Month 6-7

9.2 Metrics to Track

- Daily usage minutes and session frequency
- 7-day and 30-day retention rates
- Return rate and return reasons
- Top 10 commands used
- Top 10 failure reasons (what users ask that Woffy can't do)
- Feature adoption rates: Smart home control, Guard mode, Routines
- NPS scores by persona segment

9.3 Validation Gates

Gate	Criteria	Pass Threshold
Phase 1	Testers say "it feels alive"	70%+
Alpha	7-day retention	40%+
Beta	Failure rate in stress testing	< 2%
Launch	Support playbook + spare parts ready	100%

10. Prototype to Production

10.1 Hardware Changes

Component	Prototype	Production
Main Processor	Raspberry Pi 4/5 (₹6,500)	Pi CM4 or Custom SBC (₹3,500-4,500)
Microcontroller	ESP32 DevKit (₹500)	ESP32 Module on PCB (₹150)
Motor Drivers	4x BTS7960 (₹1,400)	Integrated IC on PCB (₹400)
Shell/Body	3D Printed PLA/ABS	Injection Molded ABS
Battery	Off-shelf 4S LiPo	Custom Li-ion, UL certified

10.2 QA Testing Gates (NEW)

Test	Requirement	Pass Criteria
Drop Test	1m drop on hard surface	No functional damage
Tip Over Test	Recovery from all angles	Auto-recovery
Motor Endurance	Continuous operation	500+ hours
Docking Cycles	Repeated dock/undock	500+ cycles
Thermal Soak	40°C for 24 hours	Normal operation
Battery Safety	UN 38.3 compliance	Pass certification
OTA Update	Update + rollback	100% success
Battery Replacement	User serviceable	< 5 minutes
Wheel Replacement	User serviceable	< 10 minutes

10.3 Supplier Strategy

- 2 suppliers qualified for every critical component
- Buffer stock plan: 30-day supply for motors, batteries, displays
- Local sourcing priority where possible (India-first)
- Quarterly supplier audits for quality consistency

10.4 Certifications Required

Certification	Region	Purpose
BIS (IS 13252)	India	Mandatory for electronics in India
CE Marking	EU	Required for EU market entry
FCC Part 15	USA	RF emissions compliance
RoHS	Global	Hazardous substances restriction
UN 38.3	Global	Lithium battery safety for shipping
ASTM F963	USA	Toy safety (if marketed to children)
EN 71	EU	Toy safety for EU market

11. Business Model & Unit Economics

11.1 Production Cost by Volume

Category	Proto (1)	Pilot (50)	Small (500)	Volume (5000)
Compute	₹7,000	₹5,500	₹4,200	₹3,500
Display	₹3,500	₹2,800	₹2,200	₹1,800
Motors + Drivers	₹6,200	₹4,500	₹3,200	₹2,400
Battery + BMS	₹4,500	₹3,500	₹2,800	₹2,200
Shell + Assembly	₹10,500	₹5,700	₹3,400	₹2,200
Other	₹8,800	₹5,650	₹3,600	₹2,450
TOTAL BOM	₹40,500	₹27,650	₹19,400	₹14,550

11.2 Pricing Strategy

Metric	500 Units	2000 Units	5000 Units
Unit Cost	₹19,400	₹16,500	₹14,550
Target Margin	40%	45%	50%
Suggested MRP	₹32,300	₹30,000	₹29,000
With 18% GST	₹38,100	₹35,400	₹34,200

11.3 Revenue Streams

- Hardware sale — primary revenue driver
- Premium AI subscription — advanced features, unlimited cloud queries
- Remote surveillance subscription — cloud storage, extended retention
- Accessories — replacement shells, charging docks, carrying cases
- Replacement parts — wheels, battery packs, fur covers
- AMC (Annual Maintenance Contract) — extended warranty + service

11.4 Cost Assumptions

Item	Assumption
Warranty Reserve	3% of unit cost
Returns Rate Target	< 5%
Returns Mitigation	Strong onboarding + daily routine triggers
Support Cost/Unit	₹500/year average

12. Development Roadmap with Gates

Phase 1: Functional Prototype (3-4 Months)

Goal: One impressive prototype for investor demonstrations

1. Month 1: Hardware assembly — motors, chassis, basic movement
2. Month 2: Core software — OLED eyes, basic emotions, touch response
3. Month 3: Intelligence — face detection, voice commands, personality
4. Month 4: Polish — shell design, demo scenarios, investor pitch

GATE: 70%+ testers say "it feels alive"

Phase 2: Alpha Development (4-6 Months)

Goal: Feature-complete alpha units for internal testing

- Add LiDAR and SLAM navigation
- Implement full 50+ emotional state library
- Integrate INIYAL voice assistant + smart home control demo
- Develop mobile app for monitoring
- Build and test auto-docking station

GATE: 7-day retention above 40%

Phase 3: Beta & Pre-Production (6-8 Months)

Goal: Production-ready design, certifications, beta testing

- Custom PCB design and validation
- Injection mold tooling for shell
- BIS, CE, FCC certification process
- Beta program with 50-100 early adopters
- Manufacturing partner selection

GATE: < 2% failure rate in stress testing

Phase 4: Launch & Scale

Goal: Commercial launch and market expansion

- Initial production run: 500 units (Cloud Edition)
- E-commerce launch: woffy.ai, Amazon, Flipkart
- Marketing campaign launch
- Begin Titan Edition development

GATE: Customer support playbook + spare parts inventory ready

13. Risk Assessment

13.1 Technical & Operational Risks

Risk	Level	Impact	Mitigation
Component supply chain	High	Delays, cost increase	Multiple suppliers, buffer stock
Certification delays	Medium	Launch delay	Early lab engagement, parallel testing
Technical complexity	Medium	Dev delays	Phased development, proven parts
Battery safety	Medium	Recalls, reputation	Certified cells, robust BMS
Software bugs	Medium	UX issues, data breach	OTA updates, security audits
Market adoption	Medium	Lower sales	Strong marketing, early adopters

13.2 Guard Mode & Surveillance Risks (NEW)

Risk	Level	Impact	Mitigation
Privacy backlash	High	Reputation damage	Visible indicators, opt-in only, strong defaults
Security breach	High	Data leak, legal	Encryption, least privilege, signed OTA
False alarms	Medium	User frustration	Tuned thresholds, learn household patterns
Child safety	High	Injury, legal	Restricted modes, low speed, soft bumpers
Legal (toy classification)	Medium	Compliance issues	Toy safety certification if marketed to <14

14. Investment Highlights

14.1 Why Invest in Woffy.ai?

- Proven Team: Onwords Smart Solutions has 400+ smart home installations and 6000+ gate automations
- Ecosystem Advantage: Integration with INIYAL creates unique value proposition
- Market Timing: $34B+ market by 2028, no dominant mid-premium player
- Two Product Lines: Cloud and Titan editions address different segments
- Real AI: Genuine capabilities — clear differentiation from scam toys
- Global Ambition: Website live (woffy.ai), designed for international markets

14.2 Use of Funds — Tied to Milestones

%	Allocation	Milestone Deliverable
40%	Product Development & Engineering	Functional prototype with smart home + guard patrol demo
25%	Tooling & Initial Production	Lock mechanical design, start injection mold
20%	Certifications & Compliance	BIS first, then CE/FCC as expansion triggers
15%	Marketing & Launch	Waitlist, pilots, preorder launch, influencer demos

14.3 One-Time Investment Required

Item	Estimated Cost
Injection Mold Tooling	₹8-15 Lakhs
Custom PCB Design + Prototyping	₹2-4 Lakhs
BIS Certification	₹2-3 Lakhs
CE/FCC Certification	₹3-5 Lakhs
Safety Testing	₹1-2 Lakhs
Industrial Design	₹2-4 Lakhs
Software Development	₹5-10 Lakhs
TOTAL ONE-TIME	₹23-43 Lakhs

15. Conclusion

Woffy.ai represents a unique opportunity to create a truly intelligent, emotionally engaging AI companion that fills a significant gap in the market between expensive premium robots (Sony Aibo at ₹2.4 Lakhs) and cheap, scam-like toys.

With Onwords Smart Solutions' proven track record in smart home technology, the integration with INIYAL voice assistant, and a clear two-edition product strategy, Woffy is positioned to capture the growing demand for meaningful AI companionship.

The technical architecture is sound, scalable, and achievable with current technology. The dual-controller design ensures safety and responsiveness. Smart home integration and guard mode features create unique differentiation in the market.

Our validation plan systematically de-risks the product through user research, home pilots, and clear go/no-go gates at each phase.

Woffy.ai is not just a product — it's the beginning of a new category of genuinely intelligent, emotionally connected AI companions from India for the world.

For more information:

woffy.ai

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