LastMile Service

Trust-Based Digital Marketplace for Rural Appliance Service

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Introduction & Context	Survey Findings & Evaluation	Methodology & System Design

Introduction & Context

Background. Rural and semi-urban India has seen rapid growth in appliance ownership (fans, mixers, TVs, refrigerators, smartphones) driven by electrification and rising incomes. But after-sales service is fragmented, informal and often distant.

> **Problem.** Households lack a reliable, convenient and trustworthy way to access brand-quality repair services, while local technicians and brands lack a structured channel to coordinate jobs and build reputation.
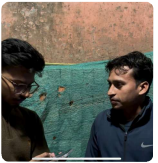
FIELD INTERVIEWS

We conducted in-person interviews with shopkeepers, roadside vendors and independent technicians in Delhi and nearby small towns to understand real constraints around time, trust and earnings.

Tea stall: repair journeys & phone use.

Evening chat on trust in local techs.

Small workshop: earnings & spares.

Young technician: how he finds jobs.

RESEARCH QUESTIONS

- How do rural households currently find and evaluate technicians?
- What minimum digital workflows (booking, matching, tracking) are realistic?
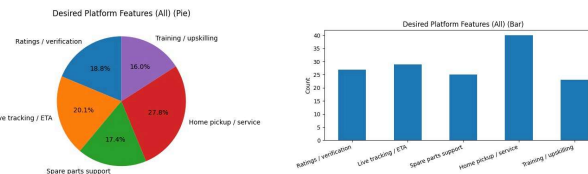- When is such a platform sustainable for consumers, technicians and brands?

Survey Findings & Evaluation

SURVEY SNAPSHOT

Method. Google Form survey (N = 58) with rural and semi-urban households that had at least one appliance repair in the last 2–3 years. Responses were collected via WhatsApp and phone-assisted filling.
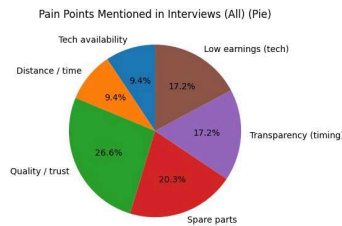
Contact preference: majority first approach a nearby technician or known shop; direct brand service centres are used less frequently.
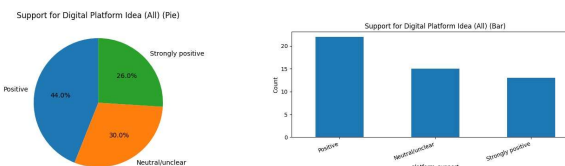
DESIRED PLATFORM FEATURES

Top expectations: doorstep service, live tracking/ETA, ratings/verification and genuine spare parts support.

PAIN POINTS FROM INTERVIEWS

SUPPORT FOR PLATFORM IDEA

About three-quarters of respondents were positive or strongly positive about a digital platform that connects them to trained local technicians.

PILOT SIMULATION (MVP)

Metric	Outcome	Interpretation
Response time	< 3 h	Jobs accepted within same half-day.
Completion rate	~89%	Most assigned jobs complete successfully.
Avg. rating	4.2 / 5	Good perceived service quality.

Methodology & System Design

RESEARCH APPROACH

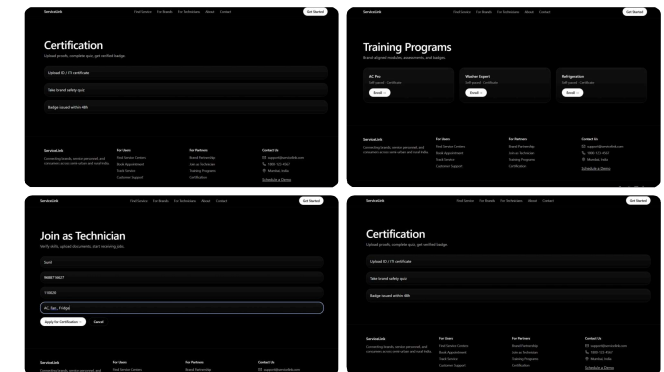| 1	2	3	4
Problem & Survey	Data Collection	System & UX Design	MVP Build

SYSTEM ARCHITECTURE

The system uses a three-tier architecture with a responsive web frontend, REST API backend and cloud database, plus integrations for SMS/WhatsApp and mapping.

Component	Tech
Frontend	React + Vite, Tailwind
Backend	Node.js, Express
Database	MongoDB Atlas
Auth	JWT, bcrypt
Deployment	Vercel, Render / VPS

KEY SCREENS FROM MVP

MATCHING & REPUTATION

Technicians are ranked using distance, appliance skills, brand tags, historical ratings and current workload. Reputation mixes average rating, volume and recency so that consistently good performance is rewarded.

PLANNED ML COMPONENTS

- Learned weights for the matching function from historical jobs.
- Demand forecasting by appliance category and locality.
- Multilingual support assistant for basic queries and routing.

Business Model

VALUE PROPOSITION

- **Consumers:** single trusted channel with transparent pricing and verified technicians.
- **Technicians:** predictable job flow, digital reputation and training opportunities.
- **Brands:** rural reach, quality visibility and structured failure data.

REVENUE STREAMS

- Small per-job commission on completed visits.
- Optional technician subscriptions for priority visibility and analytics.
- Brand / NGO contracts for co-branded programs and analytics.

PARTNER ECOSYSTEM

Illustrative partners:

Appliance: LG, Havells, Whirlpool
Mobile: Xiaomi/Redmi, Vivo, Oppo
Platforms: Urban Company, OnsiteGo, Servify

Core Platform Features

END-TO-END WORKFLOW

- Role-based registration for consumers, technicians and admins.
- Service request creation with appliance, brand, issue and preferred slot.
- Automatic technician ranking and assignment.
- Status tracking: Created → Accepted → In progress → Completed.
- SMS/WhatsApp notifications at key steps.
- Ratings and reviews feeding technician reputation.
- Admin dashboard for monitoring and exception handling.

DATA MODEL (MVP)

Key entities:

User · TechnicianProfile · ServiceRequest · Review · JobStatusHistory

Conclusion & Impact

Bridging the last mile between brands, technicians and rural households

LastMile Service shows how lightweight digital infrastructure can work with existing informal repair networks instead of replacing them.

TEAM CONTRIBUTIONS

All four team members contributed equally to framing the problem, conducting research, designing the system and building the MVP.

- **Sunil:**
  Fieldwork; Full frontend; backend; poster design; Data collection ; Algo creation ; Solution REfinement; report writing; research; problem & solution definition.
- **Sumit:**
  Problem statement refinement; fieldwork; poster; report; interactions with companies; Google Form survey design & data collection.
- **Devesh:**
  Report writing; Business Model Canvas; fieldwork; Google Form response collection; problem & solution refinement; business structure.
- **Priyanshu:**
  Backend implementation; report; fieldwork; ER diagrams; business structure; capturing and curating project images.

SELECTED REFERENCES

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Saubhagya & PMKVY scheme documents; Urban Company and OnsiteGo service models.