

Digital Transformation in Rural FMCG Supply Chains and Technology Introduction: A Case Study of Remote villages in Telangana State, India



Major Problems

"Despite contributing 50% to the FMCG sector, rural areas in India face significant challenges in accessibility, technological adoption, inclusive strategies to address geographic isolation, digital literacy gaps, and evolving consumer needs."



Difficult access to nearest grocery stores due to remote location of villages



Counterfeit products sold in villages



Local stores in villages selling more than Maximum Retail Price (MRP)



Limited availability of international/regional brands



Research Questions



How does the level of basic technical and digital knowledge influence the comfort of rural villagers in adopting technology?



What are the social impacts caused by the adopted interventions?



How could this project enhance basic skills like digital literacy, other career options for local villagers managing the project?



Methodology

Step 1: Survey

To understand the problems and products/services which are currently not available in rural areas and are procured/served by the agencies in urban areas

Sample size: 120 from 4 villages

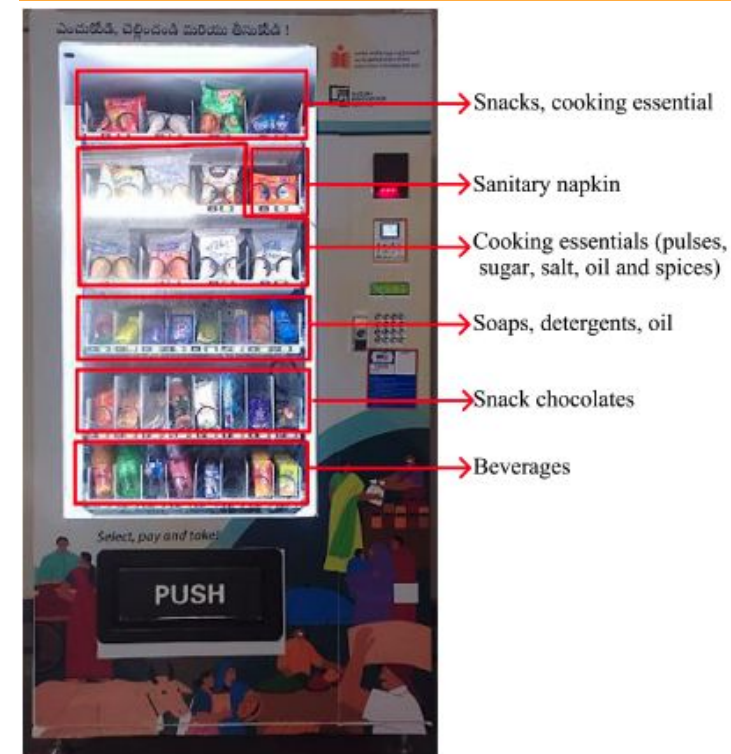


Step 2: Products and services list

Dist.	Products				Services	
0-5 Km	1	Soaps and Detergents	3	Dairy products	1	RMP clinic
	2	Cooking essentials	4	Snacks, stationary	2	Gas cylinder
5-10 Km	1	Fresh vegetables and fruits	3	Fresh meat	1	School and medical store
	2	Cooking essentials	4	Personal hygiene	2	Panchayat office
>10 Km	1	Clothing	3	Ornaments	1	Bike/Car repair, Banks
	2	Kitchenware	4	Fuel	2	Agriculture procurement centers



Step 3: Technological interventions



- Deployment of vending machines
- Doorstep delivery service
- Pilot in 7 villages



Technological Interventions

1

Vending Machine

Villagers accessed products from vending machine



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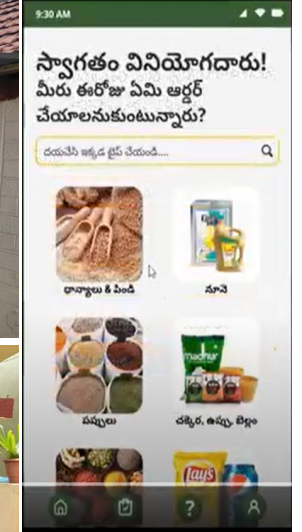
Doorstep Delivery Service

Collection of orders and delivering the products; BNP



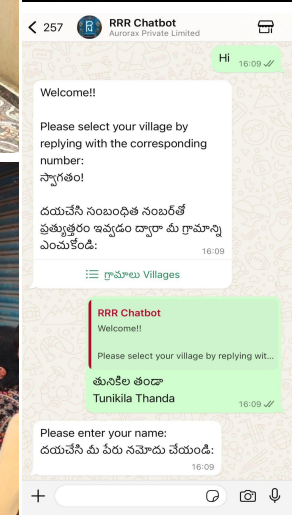
Instant messaging application

Customers sent orders via text or pictures



Instant messaging application chatbot

Streamlines order collection and management.



Key Findings

Insights on chatbot interactions

Objective of the test was to observe and understand how the chatbot affected the users' ordering experience

Users appreciated the simplicity of ordering through the messaging app.

Some users noted that less tech-savvy individuals might find typing and using the chat interface challenging.

Users pointed out the lack of visible product quantities in the catalog but could find this information on individual product pages.



Sample size: 55 from 3 villages



Key Findings

Insights on kiosk interactions

Objective of the test was to observe and understand the learning curve of the users interacting with kiosk

Users found the kiosk more interactive and visually attractive compared to smartphone

Bigger screen size of the kiosk increased visibility of the interface, making navigation easier

Some users felt overwhelmed on the sensitivity of the screen, they often ended up clicking options they did not intend to click while scrolling

Smartphone proficient users pointed out that the lack of autocorrect options on the keyboard would confuse people who weren't familiar/comfortable with typing in English



App Experience on the Phone Vs Kiosk - The Verdict

Users preferred the kiosk over their phone as an interface due to higher visibility of the UI, as well as it being accessible to users that didn't own smartphones



Key Findings

Influence of Digital Knowledge on Adoption

Younger Users' Comfort

Key benefits: 24/7 accessibility, time savings for local and market trips.

Age group 8–20 adapts well due to basic digital literacy.

Challenges for Adults & Seniors

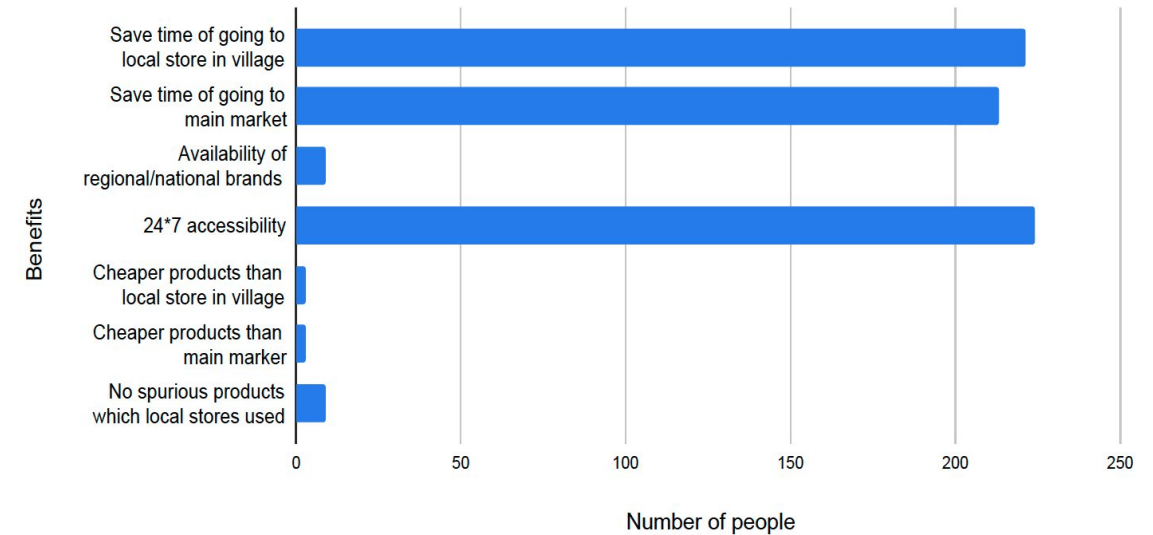
Adults (20+): Distance, usability issues, and machine malfunctions.

Seniors (60+): Depend on younger family members for assistance.

Adoption Potential

92% of villagers willing to continue using vending machines, showing adaptability.

Number of people vs Benefits of Vending machines



Barriers & Solutions

Older users (40+) face difficulties.

Solutions: Better guidance and simplified interfaces or technology.

Digital Payment Concerns

Anxiety about online transactions; addressing this can boost adoption.



Key Findings

Social impact, enhancing skills

Time & Cost Savings

Reduced travel by 5–10 km, saving 80 minutes and INR 327 per month per user. Delivery services offered cost-effective alternatives.

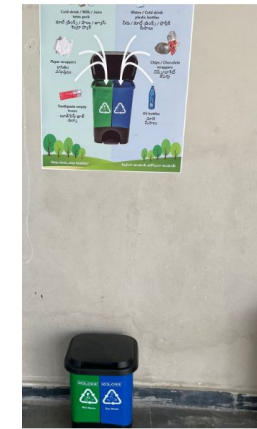
Women Empowerment

Women-led operations challenged traditional roles and supported entrepreneurial initiatives.

Enabled stigma-free purchase of sanitary products and empowered women as delivery service managers.

Digital Literacy

5 out of 7 villagers first time learned basic digital skills (e.g., Google Sheets and Forms) through project training.



Waste Management

Introduced dustbins and posters for garbage segregation, reducing litter.

Breaking Gender Roles

Female representatives led delivery services, promoting flexible work and challenging stereotypes.



Conclusions

- 👉 FMCG accessibility in rural India remains challenging despite digital advancements.
- 👉 Vending machines, doorstep delivery, and chatbots have reached underserved groups, enhancing quality of life and breaking gender stereotypes.
- 👉 Interventions created opportunities for saving time, skill development, and rural employment.
- 👉 Challenges persist in scalability, safety, and inclusivity for people with limited literacy.
- 👉 Future efforts should focus on improving user interfaces, creating safe systems, and fostering sustainable credit and entrepreneurship models

