



THINK MERIT | THINK TRANSPARENCY | THINK SASTRA

## **Reimagining Public Advertising: A Design Thinking Approach to Visual Cleanliness**

*Project report submitted to the partial fulfilment of the course*

*ENG305 Design Thinking*

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## **DECLARATION**

We hereby declare that this project represents a collaborative effort and is the result of our sustained dedication, application of Design Thinking principles, and teamwork. We affirm that this work has not been published elsewhere and contains no instances of plagiarism.

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## ABSTRACT

The balance between contemporary development and traditional or natural beauty is increasingly under challenge in rural and urban public spaces because of visual pollution, arising essentially from large-scale, unregulated use of posters and banners for political, social, and commercial communications. This project focuses on the issues created by physical advertisements in the form of visual clutter, damaged walls, and the generation of non-biodegradable solid waste and aims to identify alternatives that effectively balance the aesthetic, environmental, and public communication needs, with an objective of offering a feasible long-term strategy for reducing posters and banners in the public realm.

Following the Design Thinking process, extensive user research was conducted in test areas viz., Trichy, Thanjavur and Kumbakonam during the Empathize stage. Fifty responses were gathered from six critical stakeholder groups through surveys and one-on-one interviews. The obtained insights were converted into specific Point-of-View statements and “How Might We” questions, which led to the introduction of two main prototypes: the EcoPeel Poster Adhesive, a residue-free alternative to traditional glue that minimizes wall damage by means of removal, and the Vertical Scrolling Board (VSB), a solar-powered rotating banner display for the orderly advertisement of products or services.

The input of university staff and students pointed out that both prototypes were good for the environment, feasible and attractive, though, at the same time, they did not seem effective in solving the problem of unregulated poster placement. This knowledge led to the proposal of a controlled poster management system that uses QR-based verification and advertising zones for the municipality to manage, which integrates the regulation of posters. This project is a great example of how the human-centered design approach can be used to meet the cultural communication needs while being environmentally responsible at the same time, thus resulting in cleaner, safer, and more visually organized public spaces.

## **CHAPTER I: INTRODUCTION**

### **1.1 Background**

The purpose of rural areas, which are places where urban growth coexists with rural traits, is to demonstrate a harmony between contemporary development and traditional or natural beauty. Visual pollution, particularly the extensive use of banners and posters for social announcements, religious festivals, commercial advertising, and political campaigns, is endangering this equilibrium. These uncontrolled images, in contrast to planned urban architecture or natural landscape, add clutter and lessen the distinctive attractiveness of rural areas.

### **1.2 Context of the Problem**

Banners and posters are frequently draped over busy streets, attached to trees, glued on historic walls, and put up without formal authorization. They often linger, fading and shredding into ugly fragments long after the incident is over. Non-biodegradable materials like vinyl and plastic flex contribute to solid waste and clog drains when thrown away. Along with increased municipal cleaning expenses and possible harm to public property, the outcome is not merely a decline in aesthetic appeal.

### **1.3 Effect on Rural Aesthetics and Community Life**

With all of the clutter obscuring local art, unique architecture, and views, the visual clutter erodes the location's sense of local cultural identity. Visitors and tourists may view the county as an unkempt area, which can hurt business and tourist opportunities. Residents may not be as proud to live there, chaos may prevail, and home values may decline as they are inundated with waste.

### **1.4 Need for Action**

Banners and posters in the physical world are a familiar and affordable mode of expression, but require action for sustainable practices and regulations. Reducing visual pollution provides long-term economic benefits, civic responsibility, environmental stewardship, and considerations of aesthetics. By addressing this issue, we will be able to maintain that delicate balance between urban and rural beauty, be considerate of appropriate advertising, and respect public space.

### **1.5 Review of Existing Works**

Previous studies have explored different aspects of outdoor advertising's environmental impact. Kejin et al. (2025) used eye-tracking to show how layout and color affect viewer

attention and fatigue. Cuc & Secan (2024) compared PVC and biodegradable banner materials, promoting eco-conscious design. Sinha (2024) linked visual communication with environmental and civic ethics. While insightful, these studies remain limited to analysis and material sustainability, lacking integrated design interventions.

### **1.6 Research Gaps**

Existing studies lack real-world validation of visual comfort; most rely on laboratory-based observation and do not account for dynamic human interaction with advertisements in urban environments. Focus has largely been on waste management and material upcycling, overlooking the visual and aesthetic integration necessary to prevent clutter from the design. Current research depends heavily on public perception surveys and lacks measurable physiological data or actionable metrics for urban planning and aesthetic policymaking. There is no tested framework combining material innovation, visual harmony, and public accountability within a single, enforceable system.

### **1.7 Novelty and Uniqueness of the Study**

This project transforms the problem of visual pollution into a design-led innovation. Employing Design Thinking, it conceives two prototypes — the EcoPeel Poster Adhesive and the Vertical Scrolling Board (VSB) — to intervene the local environmental and aesthetic issues. EcoPeel recovers the poster tradition with residue-free, biodegradable posters thus guaranteeing visual cleanliness, whereas VSB offers a solar-powered, neat solution for the changeable display of banners. As a result, they establish a regulated communication model empowered by a QR-based permit system and a citizen accountability reward-penalty mechanism. The research, based on the perspectives of six stakeholder groups, produces a tested, traceable, and implementable framework that is in harmony with cultural communication, sustainability, and visual balance.

### **1.8 Objective**

The objective of this project is to provide a viable and sustainable strategy for reducing the spread of posters and banners in the urban public realm. Our emphasis will be on identifying root causes, stakeholder needs, and providing viable alternatives to balance aesthetic and environmental concerns, using public communications. The end product will envision a method that provides a community-convenient alternative for residents and local government personnel to advocate for aesthetic and clean rural areas and cultural vibrancy.



## CHAPTER II: EMPATHIZE

The Empathize phase in the Design Thinking process aimed at deeply understanding the perspectives, pain points, motivations, and lived experiences of stakeholders directly or indirectly affected by visual pollution caused by banners and posters in rural public spaces. To ensure inclusivity, 50 responses across six chosen target groups were collected, representing diverse roles in community, commerce, governance, and culture.

### 2.1 Methodology

- **Stakeholder Selection:** Six target groups were selected as major stakeholders in the ecosystem of visual communication and its regulation: citizens, local shopkeepers, business users, non-business users, print business owners, and government officials.
- **Data Collection:** A mixed-method approach was used, such as Google Form survey for citizens, students and working professionals, phone call interviews for rural community members and Government officials, and one-on-one Interviews with shopkeepers, print business owners and residents. This ensured both reach and depth in capturing stakeholder perspectives.
- **Capture Grids and Persona Development:** To synthesize behavioural patterns, motives, and problems, capture grids were created for each response. Personas were then made for each stakeholder group to humanize and summarize the results.

### 2.2 Findings from Target Groups

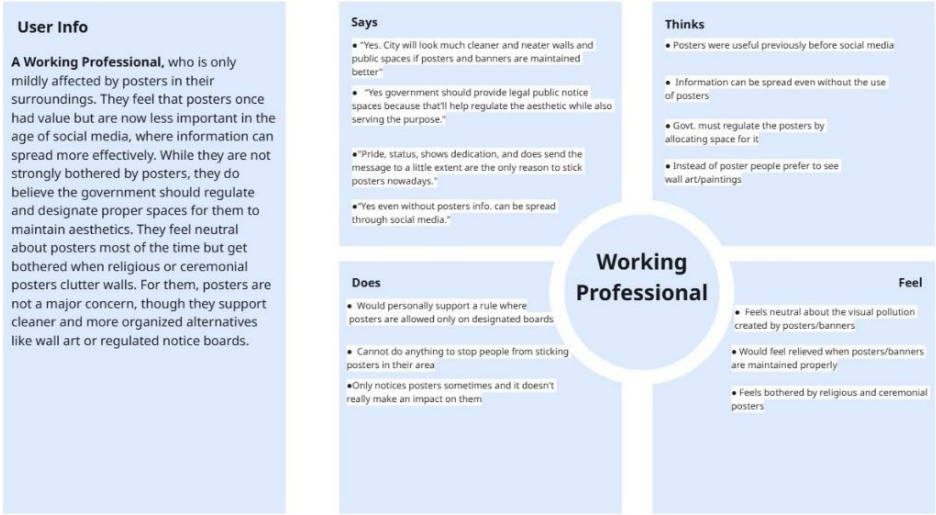
#### 2.2.1 Citizens

- **Number of responses:** 28
- **Profiles:** Rural students, urban housewives, urban senior citizens, urban students, working professionals
- **Key Findings:**

The findings revealed a generational split in perception: senior citizens view posters as heritage-linked cultural expressions, while students and professionals primarily see them as visual clutter. A significant concern for all groups is how torn and faded posters diminish the beauty of heritage walls, bus stops, and public buildings. Communication preference also varied, with seniors relying on

physical visibility while youth prefer digital channels. When asked for alternatives, citizens frequently suggested organized community boards or eco-friendly poster solutions. Ultimately, the visual clutter negatively impacts urban aesthetics by reducing pride in the locality, lowering tourism appeal, and contributing to the perception of devalued property.

● **Sample Capture Grid**



● **Persona**

Based on the insights systematically captured across the citizens' grids (including perspectives from urban professionals, students and seniors), their core views, motivations, and pain points were condensed into a single, comprehensive persona. This profile, Priya, the Concerned Urban Professional, serves as the primary target user, representing the collective desire for aesthetic order, environmental responsibility, and civic accountability.

<b>General</b>	Priya, a 28-year-old urban working professional, resides in high-density urban surroundings and commutes for considerable time, subjecting her to public signage daily. She has a strong civic sense of discipline and regards the cleanliness of the environment to be an indicator of municipal pride and competence. Although she depends on social media for most information, she believes that non-digital media must cater to parts of the population. Critically, she appreciates and honours the community's tenacity to observe
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	cultural tradition (e.g., in declaring marriages, celebrations, or temple activities) while having an appreciation for contemporary aesthetics.
<b>Objective</b>	Priya's major concern is to observe the eradication of random visual pollution brought about by posters and banners. She wants a city where public places are regulated to maintain aesthetic standards, and where public information is delivered through organized, regulated media. She aims to find the balance between the necessity of cultural/traditional communication and the requirement of a new, uncluttered environment.
<b>Key Tasks</b>	Moving around the city back and forth to her work site exposes her to the daily condition of visual distraction. She depends on her smartphone and social networks to be updated about the news, affairs, and daily announcements. She is also occasionally required to remove or report posters around private property or company boards that she is professionally or personally responsible for.
<b>Motivations</b>	She is strongly compelled by the need for civic order, aesthetic beauty, as well as systemic responsibility. She would like the appearance of her city to be professional and uplifting, motivated strongly as a preference to exchange aesthetic visual chaos with deliberate aesthetic upliftment. She understands that the persistence of posters is partially compelled by livelihood factors (poster economy) as well as the cultural importance of declaring big life milestones.
	Priya strongly dislikes political, ceremonial, and movie posters as being irrelevant and manipulative. Posters tend to be torn within a week, so the paper becomes instantly wasteful. She also feels disgusted and morally distressed due to the offensive and disrespectful co-mingling of celebratory and mournful posters within immediate physical proximity. She understands the pressure that the social

<b>Pain Points</b>	<p>forces place on families, which sometimes drives them to put up posters announcing their personal details (like a wedding) even if they themselves do not wish. The posters directly cause damage to walls that necessitate expensive repainting, increasing the cost burden on property owners. The poor enforcement of current regulations and the lack of initiative on the part of local government to remove ripped posters and deal with the aftermath of trash frustrates her. She is helpless because she cannot prevent posters from being posted illegally.</p>
<b>Happy Moments</b>	<p>She feels glad when witnessing the transformation of a previously damaged wall into a space for art or greenery or clean walls, locating significant information effortlessly from a plain, designated digital or physical bulletin board and seeing or hearing about effective government enforcement (such as large fines or loss of license) being implemented against illegal posters/advertisers, showing responsibility and active poster trash removal and meeting spotless, well-kept walls and neat public spaces on her daily commute.</p>
<b>Opportunities, Needs, and Wants</b>	<p>Priya feels that notice boards designated as legal, public spaces or digital LED screens may be provided as the formalized, compulsory alternatives by the government. She requires a guaranteed mechanism that would allow necessary information (safety, education, and announcements of cultural value) to be relayed to everyone, including the digitally illiterate, without adding to visual clutter. She also wants strict enforcement measures, an explicit mandate for municipal cleanup of poster remnants, and investment in public beautification projects that utilize wall space for art and nature rather than just leaving it blank.</p>
<b>System Used</b>	<p>Smartphone/Mobile internet, social media (WhatsApp, etc.), online news sources, newspapers, pamphlets, and</p>

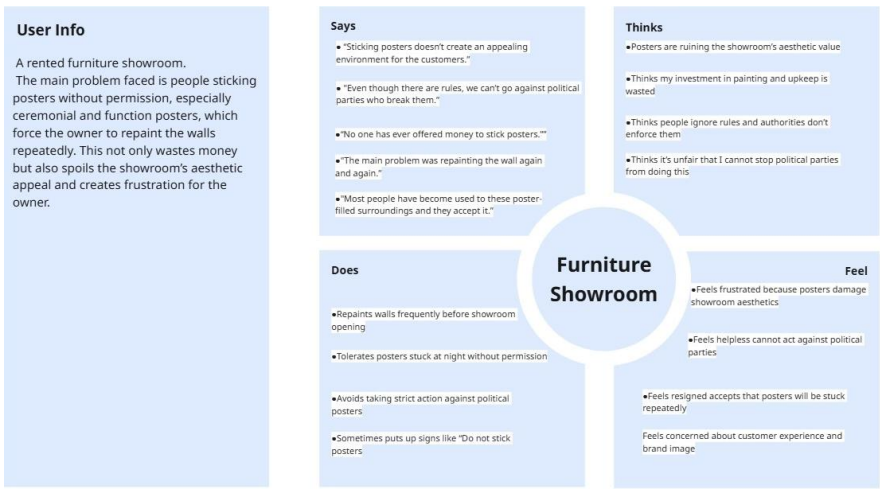
	word of mouth (among the old or among the rural citizens) are the sources used to gain information.
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### 2.2.2 Local Shopkeepers

- **Number of responses:** 8
- **Profiles:** Supermarket, shoe store, jewellery store, appliance store, furniture showroom, café, upscale store, frame shop owners
- **Key Findings:**

Store owners reported that flexes and posters reduce business exposure and consistently raise repainting expenses. Furthermore, shopkeepers often feel powerless to remove the signs, as doing so might cause tension with the neighbourhood. They noted that the proliferation of political and festival posters exacerbates overcrowding in market areas. To combat these issues, shopkeepers strongly seek tougher municipal control and inexpensive, new PR choices, such as digital signs. The resulting impact on urban aesthetics is significant, making market centres look disorganized and ugly, which ultimately detracts from their attraction to consumers and erodes their brand identity.

- **Sample Capture Grid**



- **Persona**

Based on the unique insights captured from the local shopkeepers' grids, including challenges related to store aesthetics, lost operating hours, and sales impact, the core motivations and pain points were distilled into a single, representative

persona. This profile, Reshma, The Concerned Shopkeeper, serves as the primary user, embodying the conflict between the necessity for promotion and the frustrating, costly reality of managing public visual pollution.

<b>General</b>	Reshma is a 28-year-old woman who manages sales and customer service in a rented furniture store located in a busy shopping district. The showroom creates revenue, and she takes pride in how it looks.
<b>Objective</b>	Her major goal is to keep the showroom neat, tidy, and professional to instil confidence in customers when buying; she is not fond of the disorder of posters or flexes taped to the walls of the showroom, and she has an interest in developing a business and getting business through referrals or social media.
<b>Key Tasks</b>	Reshma spends her day helping customers choose furniture, arranging displays in the showroom, and becoming involved in every step of the sale process. She also spends a fair amount of her day repainting or cleaning the walls because individuals and groups place posters, which is even more work on an already busy day.
<b>Motivations</b>	Reshma believes that the more organized a showroom looks, the more confidence it builds in customers, which ultimately adds to sales. Realizing customers are able to admire how the showroom looks, and then it becomes a reality check when individuals come back to purchase furniture after her assistance, validates the investment she provides to the showroom.
<b>Pain Points</b>	Reshma is frustrated when any political or ceremonial group tape political or ceremonial posters on the wall, because she takes pride in how organized the showroom is and it can take away from the resale to the customer.

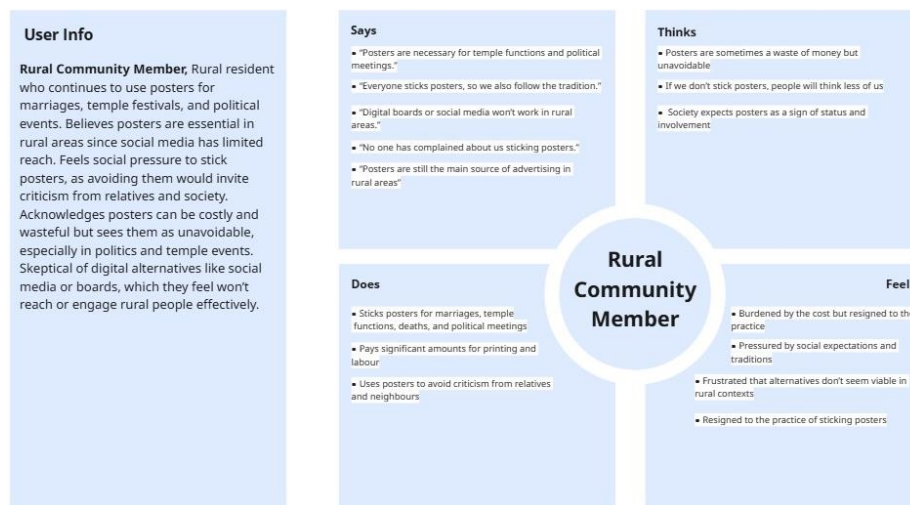
<b>Happy Moments</b>	Reshma's happiest moments are when customers spot the showroom from afar, come in because it seems so inviting, and compliment the cleanliness of the space. She is also happy when she is able to avoid painting the showroom unnecessarily and focus completely on customers, service, and sales.
<b>Opportunities, Needs, and Wants</b>	Reshma wants to see stricter enforcement of the rules prohibiting random poster pasting, the establishment of designated poster areas that are not in front of the shops, and lower cost alternatives for promotion. She would like to eventually move away from posters towards more modern digital alternatives like social media marketing to attract new customers to the showroom, all while keeping the showroom looking premium.
<b>System Used</b>	Reshma currently relies on word of mouth, handing out pamphlets in the local community, and promoting through WhatsApp and Facebook. She does not use posters and flexes to keep the showroom frontage looking clean and professional.

### 2.2.3 Non-Business Users

- **Number of responses:** 3
- **Profiles:** Rural community member, rural family members
- **Key Findings:**

This group views posters as cultural obligations essential for communicating weddings, puberty ceremonies, and funerals. This sense of duty means that while some individuals feel guilty about the pollution, the powerful influence of family and social pressure makes posters unavoidable. Despite this traditional commitment, respondents expressed openness to alternatives, specifically suggesting eco-friendly materials or designated cultural notice boards. The primary takeaway is that for non-business users, tradition currently outweighs aesthetics, though there is a clear acknowledgement of the environmental damage.

- **Sample Capture Grid**



- **Persona**

A synthesis of findings from the non-business users' grids reveals a core ethical tension. They view posters as cultural obligations for major life events (weddings, ceremonies), creating a strong sense of social pressure that often overrides individual concerns about pollution. This profile, Archana, the Socially Obligated Citizen, embodies the conflict between cultural tradition and the personal desire for clean, aesthetic public spaces.

<b>General</b>	Archana, a middle-aged resident of a small town in Tamil Nadu, uses posters for family and social events such as marriages, puberty ceremonies, temple festivals, advertisements, and funeral rites, and values tradition and community recognition.
<b>Objective</b>	She announces family or community functions in a way that reaches everyone—especially elders, while maintaining social status and fulfilling cultural expectations.
<b>Key Tasks</b>	Archana plans and designs posters for ceremonies or festivals, obtains wall permissions, coordinates with printing shops and ensure timely sticking of posters in visible public places.
<b>Motivations</b>	Her belief is that posters show respect and importance of the event. Pictures and colours attract attention, especially among elders who may not use digital platforms.



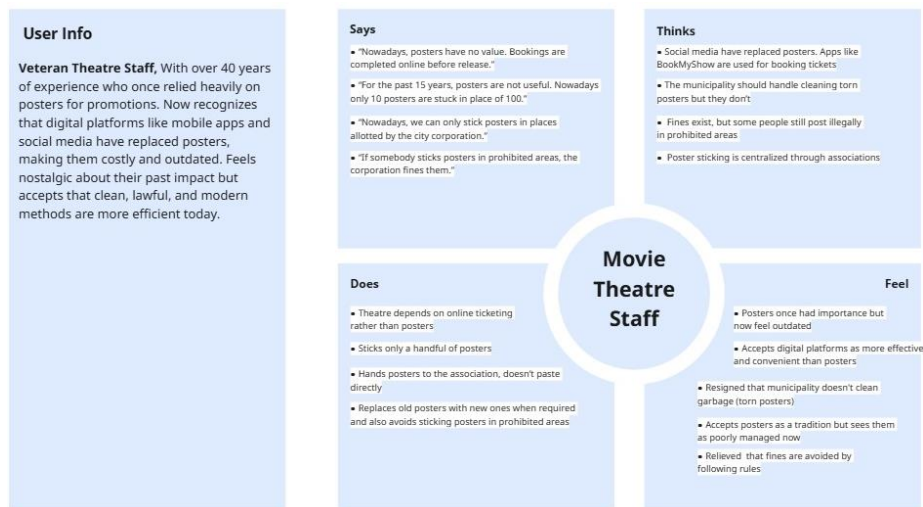
<b>Pain Points</b>	Archana finds it difficult to balance the occasional police fines or warnings and pressure from relatives who expect posters. Cost varies with size and number and she feels guilty about city cleanliness but sees few alternatives. She sees that placing posters might be complicated by political forces and traditional orders and are decreasing as a result of digital advertising.
<b>Happy Moments</b>	Archana feels happy when she sees family names and event details displayed publicly and receives compliments from relatives and neighbours for well-designed posters.
<b>Opportunities, Needs, and Wants</b>	Archana would welcome a common community wall or eco-friendly display space. She is interested in biodegradable materials, open to digital invitations if they effectively reach elders and maintain the sense of celebration.
<b>System Used</b>	She uses local printing presses for poster design and printing, community notice boards when available and basic smartphone apps like WhatsApp for sharing event photos with close contacts.

#### 2.2.4 Business Users

- **Number of responses:** 4
- **Profiles:** Boutique, electronics shop, furniture shop, movie theatre owners
- **Key Findings:**

Businesses report that they must employ both digital and physical advertising to reach a wide range of people. Although considered expensive and unsustainable, posters remain significant for older, offline consumers. The primary obstacles they face are the high expense of legal banners, administrative road-blocks in obtaining permits, and the inherently transient effectiveness of physical posters. Consequently, there is a strong interest in hybrid advertising options, such as posters featuring QR codes that connect to online resources. The sheer volume of posters in commercial districts detracts from the town's charm and runs contrary to the polished, professional image companies aim to project, negatively impacting rural aesthetics.

- **Sample Capture Grid**



- **Persona**

The capture grids for the business users highlight a critical dilemma to secure broad market reach as advertisers must manage both expensive physical media and complex digital platforms simultaneously. This profile, Rajesh Kumar, the Strategic Advertiser, encapsulates the urgent need to find hybrid, cost-effective, and officially recognized communication channels that streamline operations and connect seamlessly with diverse consumer groups.

<b>General</b>	Rajesh Kumar, 38, runs a furniture and electronics store in a small town. He has witnessed business promotions shift from wall posters to social media advertisements, prompting him to use both. He uses social media to reach younger customers, and banners and booklets for the older generation.
<b>Objective</b>	Rajesh wants a steady revenue growth and more customers to walk into his store. His goal is to remain visible in the market by utilizing the most effective combination of digital and classic tools for advertising.
<b>Key Tasks</b>	He spends time planning advertising initiatives, creating banners, requesting permits from local authorities, and running small online advertisements. He regularly leaves pamphlets in communities nearby and observes which methods bring in the most customers.

<b>Motivations</b>	Rajesh appreciates the reach and speed that digital advertisements provide. He is aware, however, that posters near busy streets and temples draw attention. He takes pride in maintaining ethical and clean advertising, which wins him respect in the community.
<b>Pain Points</b>	Torn posters are messy, banners are costly, and the town hardly ever removes them. Not all of his rural clients are online, and digital advertisements seem expensive for a small business. It is also quite difficult to obtain approval for banners.
<b>Happy Moments</b>	He is happiest at festivals because walk-ins double, sales increase, and yield positive results from promotions. An Instagram advertisement that brings in new customers also excites him. He is motivated by the community's recognition of his ethical business practices.
<b>Opportunities, Needs, and Wants</b>	Rajesh wishes that online advertisements were less expensive and simpler to handle. He wants simpler ways to obtain authorization for posters and more regulations against unlawful posters. He is welcoming towards new technology that could help him promote his business without spending too much.
<b>System Used</b>	He uses posters, banners, pamphlets, WhatsApp forwards, Instagram advertisements, and booking apps. For physical advertisements, he depends on municipal permissions and neighbour approvals.

### 2.2.5 Print Business Owners

- **Number of responses:** 2
- **Profiles:** Poster shop owner, press manager
- **Key Findings:**

For print shop owners, posters and flex orders are critical income sources, particularly during festivals and elections. While they are aware of the pollution issue, they fear losing clients if they unilaterally push for more expensive eco-

## Sample Capture Grid



<p><b>General</b></p>	<p>Kumar, a 45-year-old local poster/banner press entrepreneur, has almost 20 years of experience in typography and printing. He provides services to different kinds of customers, including movie screenings, weddings, temples, businesses, educational institutions, and politicians. He enjoys preserving long-lasting connections with clients and runs the business with the backing of a small group of workers.</p>
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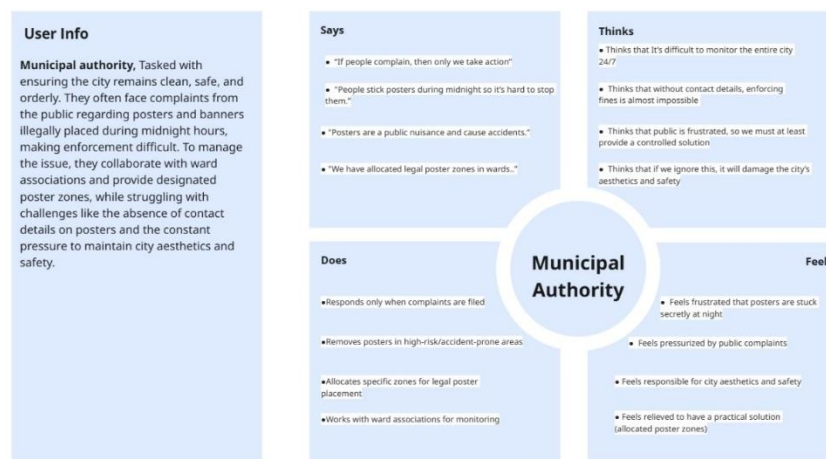
<b>Objective</b>	He continues to make a consistent profit while adjusting to shifting advertising trends. Without losing existing clients, he expands into digital or eco-friendly advertising. To avoid fines and penalties, he adheres to government regulations.
<b>Key Tasks</b>	He meets with customers, finishes designs, supervise printing schedules, ensure on-time delivery, assist clients with getting permissions, and explore potential LED display or digital board assignments.
<b>Motivations</b>	Kumar is seeking a steady income for workers and family. He tries to stay relevant while the market for conventional posters gradually decreases. He finds satisfaction in product quality and positive client reviews.
<b>Pain Points</b>	He is frequently subject to penalties and restrictions from the authorities for posting without permission and suffers from fluctuations in demand. Placing posters might be complicated by political forces. Traditional orders are decreasing as a result of digital advertising.
<b>Happy Moments</b>	He benefits from large order volumes during weddings, elections, and festival seasons and feels happy when major tasks are finished on schedule and when clients appreciate original ideas.
<b>Opportunities, Needs, and Wants</b>	He is interested in legal community advertising locations and environmentally friendly printing supplies and desires reasonably priced digital and LED printing equipment. Specific regulations are required to help small companies and lessen visual pollution.
<b>System Used</b>	He uses photoshop for design, traditional offset and digital printing equipment, approaches the local government to obtain licenses for permits, and cooperates occasionally with LED board suppliers.

### 2.2.6 Government

- **Number of responses:** 5
- **Profiles:** Police officers, municipal staff, lawyers
- **Key Findings:**

Government officials note that posters pose significant aesthetic and legal challenges; offenders are difficult to trace, and the issues are often politically sensitive. Authorities consistently lack the manpower necessary for effective enforcement across all public streets. Although they support solutions like allocated poster zones, stricter penalties, and digital boards, they face considerable feasibility and cost barriers to implementation. Furthermore, the political tolerance of illegal posters frequently weakens their enforcement capacity. Consequently, while cleanliness and order are highly valued, practical and political constraints lead to inconsistent results in managing urban aesthetics.

- **Sample Capture Grid**



- **Persona**

To effectively guide strategy, the comprehensive challenges from the Government segment grids were distilled into one representative profile. Ramesh, the Overwhelmed Official, embodies the crucial conflict between the clear need for stricter penalties and the politically constrained reality of insufficient manpower, high operational costs, and low enforcement capacity.

<b>General</b>	Ramesh, 48, works as a municipal officer in a mid-sized city. With over two decades in government service, he is responsible for keeping public spaces clean, safe, and legally compliant. His work often overlaps with the police
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	and local lawyers when it comes to enforcing poster and banner regulations.
<b>Objective</b>	Ramesh's main goal is to maintain city aesthetics and public safety by controlling unauthorized posters and banners. He wants to enforce laws fairly while balancing constant citizen complaints, political pressure, and the reality of limited staff.
<b>Key Tasks</b>	Ramesh oversees the monitoring of unauthorized posters, responds to complaints from citizens, and issues fines. He coordinates with ward staff for removal, refers to municipal laws for enforcement, and sometimes works with the police and panchayats to manage disputes. Whenever possible, he pushes for allocated poster zones to reduce random placements.
<b>Motivations</b>	He is motivated by the desire to keep the city clean and orderly. For him, visual cleanliness is as important as law and order, since messy posters often create safety hazards near roads and junctions. Positive feedback from the public gives him confidence that his work is making a difference.
<b>Pain Points</b>	Posters are usually put up at night, making it tough to catch offenders. Most banners carry no contact details, so tracing people is difficult. Political pressure and social tolerance often weaken enforcement. With limited manpower, it's impossible to monitor every street 24/7.
<b>Happy Moments</b>	Ramesh feels satisfied when allocated poster zones or digital alternatives actually work, reducing random posters across the city. He appreciates it when citizens and associations cooperate with removals, and he takes pride when people notice the city looking cleaner and more organized.
	He believes stricter penalties and stronger law enforcement are necessary. Ramesh sees opportunities in eco-

<b>Opportunities, Needs, and Wants</b>	friendly and digital advertising solutions, better coordination across municipal bodies, and technological support like mobile apps, CCTV, or reporting systems to make monitoring easier.
<b>System Used</b>	He relies on municipal regulations such as the Tamil Nadu District Municipalities Act (1920) and TN Open Places Act (1959), citizen complaint hotlines, police reporting systems, and ward-level staff. Much of the work is still manual, though he believes technology could improve it.



## CHAPTER III: DEFINE

The qualitative insights acquired during the Empathize Phase are converted into precise problem definitions that direct towards the development of solutions during the Define Phase. The recurring requirements, pain spots, and motives among all six stakeholder groups are determined using the interviews, capture grids, and personas. These findings are condensed into targeted Point-of-View (POV) statements at this phase, which reflect the main goals and difficulties of each group.

### 3.1 Methodology

- **Data Review:** All the survey, interview, and grid findings were combined into a single dataset for focused analysis.
- **Theme Clustering:** Recurring issues such as cultural pressure, economic dependence, weak enforcement and environmental impact were grouped across all six stakeholder groups.
- **Problem Statements:** Key themes were converted into clear problem statements and checked against personas for accuracy.

### 3.2 Point-of-View Statements

The following are the Point-of-View statements that clearly define the core challenges and needs of each stakeholder group, setting the stage for focused ideation and solution development in the next phase.

#### 3.2.1 Citizens

##### POV 1

Priya, an educated urban professional, has good civic consciousness and requires hygienic and pleasant environments, as daily visuals of unregulated banners and posters makes travel stressful for her and lowers the aesthetic of cities.

##### POV 2

Priya is frustrated and powerless because no authorities control or scrub away poster residue, causing garbage and defaced walls, which makes it difficult for her to believe in civic duty.

### **POV 3**

Priya is sensitive to cultural traditions but becomes ethically troubled when celebration posters are placed alongside mourning or political posters to create disrespect and emotional upheaval.

### **POV 4**

Even families that do not desire to paste posters are pushed by families and societies to do so for weddings or events as they are a must culturally.

### **POV 5**

Priya favours digital media; however, she recognises that elders and rural residents depend on physical posters, resulting in the absence of a universally effective alternative accommodating all age demographics and literacy proficiencies.

## **3.2.2 Local Shopkeepers**

### **POV 1**

Reshma, a store owner, needs to deter people from placing posters on her showroom walls, because it contributes to the deterioration of a professional presentation of her store and provides her with additional work each day.

### **POV 2**

Reshma needs her business front to appear tidy and inviting because the visual appearance of her front conveys trust and influences consumer purchasing behaviour.

### **POV 3**

Reshma is frustrated that local organizations use posters for advertisement as a medium for communicating their message, and they often target her storefront walls. She wants a better system in place for communicating important information.

### **POV 4**

Reshma wants to devote time to customer experience and sales, not cleaning walls, and needs something that is going to take the hours away from the business and save her time to keep her shop running as it should.

### **POV 5**

Reshma takes pride in her showroom's professional look, and she needs authorities to enforce rules against poster pollution, as she cannot handle the issue alone.

### **3.2.3 Non-Business Users**

#### **POV 1**

Archana, a non-business poster user, needs a way to honour traditions and maintain their social reputation, but they feel conflicted because posters create visual pollution and make them feel guilty about spoiling the town's cleanliness.

#### **POV 2**

Archana wants communication methods that feel familiar and accessible to older residents, because their dependence on physical posters keeps them informed, but it also prevents the wider community from moving toward sustainable and digital practices.

#### **POV 3**

Archana wants designated community walls or eco boards for posters because without them, she is forced to paste posters on random walls, leading to fines, conflicts, and messy public spaces.

#### **POV 4**

Archana needs cost-effective ways to celebrate and gain recognition, because the recurring expense of printing posters strains their finances, even though they still feel pressure to continue the practice for social standing.

#### **POV 5**

Archana needs alternatives that provide the same social respect as posters, because they face pressure from relatives and neighbours to put them up, even when they want to adopt cleaner or digital options.

### **3.2.4 Business Users**

#### **POV 1**

Rajesh, a small-town store owner, wants to attract customers using banners and posters, but fears that torn posters may affect his business and degrade the aesthetic of his town.

#### **POV 2**

Rajesh wants to reach both younger and older customers, but many rural customers are offline, making digital ads ineffective for them

#### **POV 3**

Rajesh wants to use posters and banners ethically, but the process to get municipal approval is slow, causing delays and frustration.

#### **POV 4**

Rajesh wants to advertise effectively without overspending, but physical banners are costly, and torn posters waste money.

#### **POV 5**

Rajesh values community respect and wants his advertising to reflect his ethical business practices, but messy posters and unregulated advertisements undermine his efforts.

### **3.2.5 Print Business Owners**

#### **POV 1**

Kumar, a veteran poster shop owner who depends on physical posters for 25% of his income, needs a way to adapt to the shift toward digital promotion because traditional orders are declining, and he wants to keep his workers employed.

#### **POV 2**

Kumar needs a simple, legal framework to continue advertising supportively because current regulations are unclear and inconsistently enforced.

#### **POV 3**

Kumar needs to maintain customer loyalty while introducing eco-friendly solutions because clients often insist on traditional, low-cost posters.

#### **POV 4**

Kumar needs steady year-round revenue because income fluctuates outside peak seasons and spikes during weddings, elections, and festivals.

#### **POV 5**

Kumar wants to upgrade to digital/LED capabilities but struggles with high investment costs and a lack of technical guidance.

### **3.2.6 Government**

#### **POV 1**

Ramesh, a municipal officer, wants to prevent unauthorized posters, but many are put up at night, making it difficult to catch offenders.

#### **POV 2**

Ramesh wants to enforce regulations fairly, but most banners and posters lack contact details, making it difficult to identify the offenders.

**POV 3**

Ramesh wants to enforce municipal laws consistently, but political pressures and social tolerance often prevent strict enforcement.

**POV 4**

Ramesh wants to maintain city cleanliness, but limited staff and manual monitoring make it impossible to keep every public space free from posters.

**POV 5**

Ramesh wants to reduce visual pollution, but current advertising methods rely on physical posters; he sees potential in eco-friendly or digital alternatives to balance advertisements with city aesthetics.

## CHAPTER IV: IDEATE

The purpose of the Ideate phase is to develop innovative and workable solutions for the identified issues. To formulate creative solutions that reduce visual pollution in urban areas while preserving the cultural and communication functions of posters and banners, the insights and point-of-view statements from each stakeholder group to generate "How Might We" (HMW) questions were utilized. The primary objective of the approach was to create balanced, sustainable solutions that enhance the appearance and usability of public places.

### 4.1 Methodology

- **Idea Extraction:** To promote creative thinking, each POV statement from the Define phase was transformed into several How Might We (HMW) questions.
- **Brainstorming Sessions:** Group brainstorming sessions were conducted to collect lots of ideas from economic, environmental, and cultural perspectives.
- **Concept clustering:** Ideas were organized under recurring topics, such as digital transformation, sustainable advertising strategies, awareness, education campaigns, and policy development.
- **Feasibility screening:** To locate the most promising ideas, each one was reviewed for feasibility, affordability, sustainability, and community acceptance.
- **Idea Documentation:** For clarity during the prototype phase, findings were organized into simple tables that linked each POV statement to its corresponding HMW questions and solution concepts.

### 4.2 Key Ideas and Solution Concepts

From the POV statements in the previous chapter, HMW questions and solutions were framed. They are displayed in tables for each stakeholder as follows:

#### 4.2.1 Citizens

POV No.	HMW Question	Solutions
	HMW design attractive, legal spaces for community communication that reduce random poster pasting?	<ul style="list-style-type: none"><li>➤ Notice boards with clear themes (local events, jobs)</li><li>➤ Modular, illuminated kiosks with weather-proof, cleanable pinboards</li></ul>

<b>POV 1</b>		<ul style="list-style-type: none"> <li>➤ Paid/leased zones with a permit system managed by the municipality</li> </ul>
	HMW transform currently misused walls into community art/green walls to discourage poster placement?	<ul style="list-style-type: none"> <li>➤ Motivational quote walls with simple stencils or paint</li> <li>➤ Permanent mural commissions for durable visual impact</li> <li>➤ Anti-adhesion coatings and vertical greenery installations</li> </ul>
	HMW use technology (QR codes, digital boards) to share event details without causing visual clutter?	<ul style="list-style-type: none"> <li>➤ QR Code zoning system replacing paper with permanent QR plaques linking to a central webpage</li> <li>➤ Integration with city app notifications.</li> <li>➤ Local smart LED display boards (smart boards)</li> </ul>
<b>POV 2</b>	HMW enable citizens to empower themselves through simple tools/apps to report and monitor prohibited posters?	<ul style="list-style-type: none"> <li>➤ WhatsApp/Telegram photo reporting</li> <li>➤ Citizen reporting mobile app with geo-tagging and status tracking</li> <li>➤ Community leader dashboards prioritizing reports</li> </ul>
	HMW create partnerships among municipalities and nearby communities to quicken billboard cleanup?	<ul style="list-style-type: none"> <li>➤ Spotless zone contracts outsourcing cleanup to local businesses</li> <li>➤ Rapid residue removal teams with specialized tools</li> <li>➤ "Report-to-reward" schemes incentivizing citizen reporting with rewards</li> </ul>
	HMW create visible enforcement (fines, penalty boards, removal teams) to regain citizen confidence?	<ul style="list-style-type: none"> <li>➤ Immediate polluter notification with digital violation notices</li> <li>➤ Public penalty walls/boards showing enforcement statistics</li> <li>➤ Branded cleanup vehicles for visibility</li> </ul>

<b>POV 3</b>	<p>HMW implement category-based community boards (fests, memorials, civic information) to maintain dignity?</p>	<ul style="list-style-type: none"> <li>➤ Colour-coded and header-mandated posters for content sensitivity</li> <li>➤ Dignity-zoned boards separating celebrations, memorials, and civic information</li> <li>➤ Temporal policy enforcing category-specific display durations</li> </ul>
	<p>HMW create alternatives to design posters that honour tradition without inducing anarchy (eco-banners, LED boards)?</p>	<ul style="list-style-type: none"> <li>➤ Official digital templates for traditional announcements</li> <li>➤ Subsidized biodegradable/reusable banner programs</li> <li>➤ Designated communal projection spots for digital displays</li> </ul>
	<p>HMW organize awareness campaigns to facilitate cultural sensitivity in mass messages?</p>	<ul style="list-style-type: none"> <li>➤ “Respect Our Zones” media campaigns emphasizing emotional impacts</li> <li>➤ Partnered livelihood training on new zoning and sensitivity rules</li> <li>➤ “Design with Dignity” contests for respectful communication</li> </ul>
<b>POV 4</b>	<p>HMW provide equally prestigious alternatives (official digital boards, community displays) that replace posters?</p>	<ul style="list-style-type: none"> <li>➤ Certified digital stamps indicating posters</li> <li>➤ Permanent commemorative plaques on community walls</li> <li>➤ Premium municipal LED event announcement slots</li> </ul>
	<p>HMW create a recognition system (government/community certificate, app shout-outs) to reduce pressure to use posters?</p>	<ul style="list-style-type: none"> <li>➤ Community “Green Event” showcases on official channels</li> <li>➤ Formal aesthetic citizen certificates</li> <li>➤ Event sponsorship discounts for poster-free commitments</li> </ul>
	<p>HMW advocate for social influencers and community</p>	<ul style="list-style-type: none"> <li>➤ RWA mandates and training for neighbourhood enforcement</li> </ul>



	leaders to promote poster-free cultural events?	➤ Partnerships with religious/community leaders as cultural ambassadors; high-profile success story media campaigns
<b>POV 5</b>	HMW create hybrid systems (digital and community notice boards) to reach and interact with both online and offline audiences?	➤ Simplified pictograms and infographics on all physical notices ➤ Hybrid “Scan & Read” physical-digital summaries ➤ Vocal and broadcast outreach via community announcement vans/speakers.
	HMW create inexpensive, environmentally friendly materials (fabric, biodegradable boards) as poster alternatives to inclusive communication?	➤ Government-subsidized reusable fabric banners ➤ Biodegradable banner programs ➤ Reusable vinyl board wraps
	HMW incorporate temples, schools, and community halls as offline sources of information?	➤ High-density pinboards at temples, schools, and community halls ➤ Official information drop-off points with trained staff ➤ Digital displays sharing civic updates at trusted venues

#### 4.2.2 Local Shopkeepers

POV No.	HMW Question	Solutions
	HMW create deterrents or protective devices that would deter patrons from putting posters on store walls in the first place?	➤ Slippery surface panels (acrylic / polycarbonate) over targeted walls ➤ "No Posting" decals with fine/charity warning

<b>POV 1</b>		<ul style="list-style-type: none"> <li>➤ Motion-activated outdoor lighting to discourage posting</li> </ul>
	HMW develop low-cost, low-maintenance wall coverings to make it possible to improve how easy it is for patrons to place posters?	<ul style="list-style-type: none"> <li>➤ Designated poster zones with cork or felt board in an unobtrusive area</li> <li>➤ Graffiti paint for easy poster removal</li> <li>➤ Slatwall or grid system for easy poster handling</li> </ul>
	HMW empower shopkeepers to report or remove unauthorized poster usage promptly?	<ul style="list-style-type: none"> <li>➤ "Poster Patrol" app feature for photo-based, geotagged reports.</li> <li>➤ Clean wall kit (scraper and citrus-based remover).</li> <li>➤ Local youth teams for collective removal.</li> </ul>
<b>POV 2</b>	HMW enable shopkeepers to maintain curb appeal while minimizing clean-up time?	<ul style="list-style-type: none"> <li>➤ Hanging planters/vertical gardens blocking wall space.</li> <li>➤ Window wash service, including poster check/removal.</li> </ul>
	HMW create a community-based improvement process for business-front aesthetics?	<ul style="list-style-type: none"> <li>➤ Competitions for beautiful storefronts with rewards</li> <li>➤ Merchant association aesthetic committee and voluntary code</li> <li>➤ Community art murals on frequently targeted at walls</li> </ul>
	HMW create value for businesses based on clean aesthetics that would promote other authorities, local or global, to support systems of suppliers for enforcement?	<ul style="list-style-type: none"> <li>➤ Certified badges for marketing/tourism promotion</li> <li>➤ Property tax incentive for poster-resistant upgrades</li> <li>➤ Corporate sponsorship for contests or clean kits</li> </ul>

<b>POV 3</b>	HMW support local governance in elevating poster pollution as a concern?	<ul style="list-style-type: none"> <li>➤ Unified reporting system (app/phone line)</li> <li>➤ Business impact report to present cleanup costs to city leaders.</li> </ul>
	HMW co-design regulations with local groups and shopkeepers to help distribution and enforcement feel equitable?	<ul style="list-style-type: none"> <li>➤ Workshops to design rules together</li> <li>➤ Permitted poster licensing system for legal, seasonal posting</li> </ul>
	HMW provide penalties and alternatives as a package deal that introduces strict rules while supplementing promotional opportunities?	<ul style="list-style-type: none"> <li>➤ Illegal poster fine and legal posting warnings</li> <li>➤ Free city training for legal marketing.</li> <li>➤ Three-Strike system: warning, small fine, large fine</li> </ul>
<b>POV 4</b>	HMW automate or simplify poster removal?	<ul style="list-style-type: none"> <li>➤ Surface panels requiring no action</li> <li>➤ Peel-off protective film for quick total cleaning</li> </ul>
	HMW provide shopkeepers with an easy, streamlined process on city property?	<ul style="list-style-type: none"> <li>➤ Poster patrol app for instant reports</li> <li>➤ City cleanliness teams dedicated to removal</li> </ul>
	HMW design awareness campaigns reduce the need for constant wall-cleaning at the source?	<ul style="list-style-type: none"> <li>➤ Partner with major poster users to promote compliance</li> <li>➤ "This is not a Billboard" warning signs</li> </ul>
	HMW encourage local governance to take poster pollution more seriously through simple reporting systems?	<ul style="list-style-type: none"> <li>➤ Unified reporting app to build an evidence case</li> <li>➤ Reframe as economic/tourism issue for city action</li> </ul>

<b>POV 5</b>	HMW co-design regulations with both shopkeepers and local groups so enforcement feels fair and balanced?	<ul style="list-style-type: none"> <li>➤ Periodic review of rules</li> <li>➤ Enforcement review board (shopkeepers, officials, community) for appeals.</li> </ul>
	HMW introduce penalties and alternatives together, so rules are strict but still offer promotional opportunities?	<ul style="list-style-type: none"> <li>➤ Community service option for offenders</li> <li>➤ Promotional grant for compliant organizations</li> </ul>

#### 4.2.3 Non-Business Users

<b>POV No.</b>	<b>HMW Question</b>	<b>Solutions</b>
<b>POV 1</b>	HMW implement environmentally friendly or recyclable poster types that enhance traditions without waste?	<ul style="list-style-type: none"> <li>➤ Bio-ink posters made from organic sources and biodegradable</li> <li>➤ Seed-embedded paper posters that can be planted after use, minimizing waste.</li> </ul>
	HMW develop awareness programs that exhibit cultural pride regarding clean places instead of merely decorated rooms?	<ul style="list-style-type: none"> <li>➤ Campaign showcasing clean, beautiful traditional events</li> <li>➤ Community art projects using recycled materials with cultural themes</li> <li>➤ Virtual clean room tours to educate about cleanliness</li> </ul>
	HMW offer residents a compromise that balances aesthetics and traditional values without undermining recognition?	<ul style="list-style-type: none"> <li>➤ Aesthetic banner rules for size, placement, and design</li> <li>➤ Banner beautification contests encouraging culturally respectful designs</li> </ul>
	HMW frame blended offline and digital solutions that will be effective in reaching the elderly?	<ul style="list-style-type: none"> <li>➤ Broadcast events on community radio cable</li> <li>➤ Battery-powered audio QR code players at physical posters</li> </ul>

<b>POV 2</b>	HMW also make digital invitations more inclusive and celebratory to the elderly generations?	<ul style="list-style-type: none"> <li>➤ Large-font, high-contrast digital invitations.</li> <li>➤ Invitation crafting workshops pairing youth and elders</li> </ul>
	HMW still make elders feel respected and included even if we do less poster printing?	<ul style="list-style-type: none"> <li>➤ Formal roles with physical scrapbooks or legacy walls</li> <li>➤ Preview sessions for digital announcements at community centres</li> </ul>
<b>POV 3</b>	HMW construct common community walls or eco-aware building for public visuals and transmissions?	<ul style="list-style-type: none"> <li>➤ Rotating community pole kiosks with multiple notice sides</li> <li>➤ Green mural community walls made from moss and plants.</li> <li>➤ Billboards combining gardens and bulletin boards</li> <li>➤ Rotating story frames at local businesses</li> </ul>
	HMW partner with local authorities to make regulated poster areas easily accessible and socially acceptable?	<ul style="list-style-type: none"> <li>➤ Permit kits sold by stationery shops with municipal-approved stickers</li> <li>➤ Streamlined zoning and pre-approved design for community boards</li> </ul>
	HMW create active programs for display that are festive, aesthetic, and still minimise visual clutter?	<ul style="list-style-type: none"> <li>➤ Digital/physical scavenger hunts with QR codes linking to prizes</li> <li>➤ Rotating exhibits featuring local history and art</li> </ul>
	HMW make alternative solutions (digital and community screens) less expensive than posters as a traditional medium?	<ul style="list-style-type: none"> <li>➤ Sponsorships on refurbished public digital screens with local business sponsorship</li> <li>➤ Local radio and online bulletin board partnerships</li> </ul>

<b>POV 4</b>	HMW lighten the economic burden through the introduction of low-cost, reusable, or pooled-display technologies?	➤ Large re-usable canvas banners with rentable letter-size pockets for announcements
	HMW encourage families to transition into cost-saving, sustainable practices without letting social value deteriorate?	➤ Digital archive of family/ businesses' milestones preserving social respect digitally over temporary posters
<b>POV 5</b>	HMW normalize and celebrate sustainable choices so that families gain the same social standing without posters?	➤ Officially supported reusable fabric banners ➤ Shared celebration archway for milestone events.
	HMW come up with mutually agreed-on community guidelines that reduce the need to post flyers everywhere?	➤ Community-wide reusable celebration/mourning flags with symbolic markers for each home
	HMW plan recognition systems (digital screens, community screens, green boards) that will satisfy social expectations?	➤ Personalized street banner sponsorships for grand, official recognition displayed over main streets.

#### 4.2.4 Business Users

<b>POV No.</b>	<b>HMW Question</b>	<b>Solutions</b>
	HMW help businesses promote their store effectively without contributing to visual clutter?	➤ Rurban business directory app and physical kiosk with subscription model and QR code for clean, digital presence ➤ Standardized & rotating community display boards with uniform slots and rotation scheduling for fairness and order

<b>POV 1</b>	HMW create advertising materials that are easy to remove or biodegradable after use?	<ul style="list-style-type: none"> <li>➤ Standardized reusable zip-tie system for banners</li> <li>➤ Seed paper and plant-based polymer posters eco-friendly and biodegradable, turning litter into flowers</li> </ul>
	HMW encourage the community to respect and maintain public advertising spaces?	<ul style="list-style-type: none"> <li>➤ Certification with window decals and positive PR</li> <li>➤ Programs sponsoring youth groups to care for advertising spots, fostering responsibility and engagement</li> </ul>
<b>POV 2</b>	HMW make digital promotions more accessible and affordable for small-town audiences?	<ul style="list-style-type: none"> <li>➤ Solar-powered community digital notice boards for shared rotating ads</li> <li>➤ WhatsApp broadcast groups distributing flyers digitally</li> </ul>
	HMW combine physical and digital advertising so that older customers are not left out?	<ul style="list-style-type: none"> <li>➤ QR-enabled posters directing to offers with simple call options</li> <li>➤ Eco-friendly flyers carrying digital links or contact info</li> </ul>
	HMW educate rural customers to engage with digital ads easily?	<ul style="list-style-type: none"> <li>➤ Weekly local digital literacy sessions covering WhatsApp, QR scanning, audio ads</li> <li>➤ Voice-based digital campaigns sending recorded local language messages through IVR calls</li> </ul>
	HMW simplify the approval process for small businesses wanting to advertise responsibly?	<ul style="list-style-type: none"> <li>➤ One-click mobile permit app for instant auto-approval</li> <li>➤ Pre-approved poster templates downloadable by businesses</li> <li>➤ Co-operative licensing pooling posters under one permit</li> </ul>

<b>POV 3</b>		<ul style="list-style-type: none"> <li>➤ Kiosk-based instant licensing via purchase tokens</li> </ul>
	HMW create a transparent system that tracks approved advertising spaces and permits?	<ul style="list-style-type: none"> <li>➤ GIS-based online map of approved poster zones</li> <li>➤ Digital permit stickers with verification</li> <li>➤ Public display dashboards listing approved advertisements</li> </ul>
	HMW reduce illegal posterage by making legal processes easier and faster?	<ul style="list-style-type: none"> <li>➤ Monthly low-cost subscriptions for unlimited permitted eco-posters</li> <li>➤ Incentive program awarding priority approvals and discounts to compliant businesses</li> <li>➤ Legal wall sharing with rotating paid slots</li> </ul>
<b>POV 4</b>	HMW provide cost-effective advertising solutions that also reduce visual pollution?	<ul style="list-style-type: none"> <li>➤ Shared rotating digital billboards</li> <li>➤ Micro-ad corners inside local shops</li> <li>➤ Sticker ads on utility bills/receipts</li> <li>➤ Monthly poster subscription bundles with eco-friendly materials and maintenance</li> </ul>
	HMW reuse or recycle banners and posters to minimize waste?	<ul style="list-style-type: none"> <li>➤ Upcycled banners made into bags, mats</li> <li>➤ Rewritable banner cloths with erasable inks</li> <li>➤ Shredded posters repurposed as packaging</li> <li>➤ Deposit-return programs incentivizing recycling</li> </ul>



	HMW create alternatives that attract attention without requiring repeated physical materials?	<ul style="list-style-type: none"> <li>➤ Portable projection advertising</li> <li>➤ AR posters with interactive content</li> <li>➤ Street performances/live ads.</li> <li>➤ Eco-ad murals blending ads into art refreshed periodically</li> </ul>
<b>POV 5</b>	HMW enable businesses promote their stores while strengthening community aesthetics and ethics?	<ul style="list-style-type: none"> <li>➤ Branded public utility items (benches, bins, racks)</li> <li>➤ Sponsorships of community events with clean advertising</li> <li>➤ Interactive kiosks combining engagement and ads</li> </ul>
	HMW showcase businesses that adopt eco-friendly and ethical advertising methods?	<ul style="list-style-type: none"> <li>➤ Eco-friendly business badges / certificates awarded by local authorities.</li> <li>➤ Annual green business awards</li> <li>➤ Neighbourhood eco-maps highlighting responsible businesses</li> </ul>
	HMW motivate other business owners to adopt responsible advertising practices in public spaces?	<ul style="list-style-type: none"> <li>➤ Discounts on permits, free digital slots, and eco-material support</li> <li>➤ Poster reuse/exchange networks</li> <li>➤ Visual guideline kits for cohesive, low-clutter advertising</li> </ul>

#### 4.2.5 Print Business Owners

POV No.	HMW Question	Solutions
	HMW help poster printers diversify into digital/eco-friendly services without losing their current clientele?	<ul style="list-style-type: none"> <li>➤ Digital mock-ups, poster and digital bundles</li> <li>➤ Seed paper posters, local sourcing and take-down service</li> </ul>

<b>POV 1</b>		<ul style="list-style-type: none"> <li>➤ QR code enabled posters with managed landing pages</li> </ul>
	HMW provide affordable training or resources so printers can learn digital design and marketing skills?	<ul style="list-style-type: none"> <li>➤ Government grants for workforce upskilling</li> <li>➤ Funded training sessions by software providers</li> </ul>
	HMW create a phased transition plan that protects jobs while introducing modern advertising options?	<ul style="list-style-type: none"> <li>➤ Employees learn complementary skills</li> <li>➤ Small team are assigned for digital/eco innovation</li> <li>➤ Combine physical posters with digital campaigns</li> <li>➤ Manage community boards with municipality partnership</li> </ul>
<b>POV 2</b>	HMW establish clear, easy-to-follow municipal guidelines for legal poster placement?	<ul style="list-style-type: none"> <li>➤ Color-coded zoning map with Green (allowed), Amber (restricted), Red (prohibited) zones</li> <li>➤ Poster placement code visual guiding dos and don'ts</li> <li>➤ Standardized poster sizes and duration limits with legal specifications</li> </ul>
	HMW integrate a low-cost online permit system that saves time for both printers and clients?	<ul style="list-style-type: none"> <li>➤ Manage service providers to permit poster volume monthly</li> <li>➤ Fast-pass digital stamp system with QR codes</li> <li>➤ Permit procurement as a paid add-on service</li> </ul>
	HMW create a community board network where printers can place ads without penalty?	<ul style="list-style-type: none"> <li>➤ Curated community board network managed with municipality</li> <li>➤ Hybrid boards/LCD displays with digitized posters</li> </ul>

		<ul style="list-style-type: none"> <li>➤ Designated community poster wall as a focused posting area</li> </ul>
<b>POV 3</b>	<p>HMW convince customers that biodegradable or reusable materials are worth a small extra cost?</p>	<ul style="list-style-type: none"> <li>➤ Cost-Per-View framing presenting eco-cost as brand investment</li> <li>➤ Eco-Upgrade demo kits for tangible experience.</li> <li>➤ Community care narrative messaging</li> <li>➤ Tiered eco-impact menu with pricing options from recycled to seed paper</li> </ul>
	<p>HMW provide attractive design templates or incentives that highlight eco-friendly printing as a prestige option?</p>	<ul style="list-style-type: none"> <li>➤ Sustainable partner loyalty program</li> <li>➤ Eco-boost marketing bundle (free social media graphics)</li> <li>➤ Storytelling templates emphasizing nature and local aesthetics</li> </ul>
	<p>HMW collaborate with local governments to subsidize or certify green printing to boost customer confidence?</p>	<ul style="list-style-type: none"> <li>➤ Green publicity grant pool for subsidizing costs</li> <li>➤ Official eco-partner status endorsement</li> <li>➤ Co-host sustainable business workshops with local bodies</li> </ul>
	<p>HMW help printers secure off-season contracts such as community notice boards or indoor branding?</p>	<ul style="list-style-type: none"> <li>➤ Managed community board services for municipality</li> <li>➤ Indoor branding packages for local businesses</li> <li>➤ Corporate wayfinding and safety sign contracts</li> </ul>
	<p>HMW introduce subscription-based advertising packages that provide recurring income?</p>	<ul style="list-style-type: none"> <li>➤ Local business booster subscription with flyer and digital services</li> </ul>

<b>POV 4</b>		<ul style="list-style-type: none"> <li>➤ Event planner’s partner yearly subscription package</li> <li>➤ “Always-On Advertising” community board slots</li> </ul>
	HMW connect printers with schools, NGOs, and small businesses for regular low-volume work?	<ul style="list-style-type: none"> <li>➤ Essential kits tailored for schools, NGOs, small businesses</li> <li>➤ Official printer partnership with business associations</li> <li>➤ Workshops for nonprofits and SMBs</li> </ul>
<b>POV 5</b>	HMW provide micro-loans or government incentives to upgrade printing technology?	<ul style="list-style-type: none"> <li>➤ Green technology upgrade consortium applying for grants</li> <li>➤ Energy efficiency Debate programs</li> <li>➤ Technology modernization microloans</li> <li>➤ Rurban revitalization grants targeting visual pollution reduction</li> </ul>
	HMW create shared community digital display hubs where multiple printers can pool resources?	<ul style="list-style-type: none"> <li>➤ Digital advertising cooperative for shared digital boards</li> <li>➤ Partnership with business incubators</li> <li>➤ Hyperlocal news &amp; ad networks on smaller screens</li> <li>➤ Slot-based rental model for digital ad time sharing</li> </ul>
	HMW offer cooperative training programs so printers can collectively invest in and operate LED/digital boards?	<ul style="list-style-type: none"> <li>➤ Print technology training collective pooling resources</li> <li>➤ Vendor-supported “train-the-trainer” sessions</li> <li>➤ Shared apprenticeship model for digital technology</li> </ul>

#### 4.2.6 Government

POV No.	HMW Question	Solutions
POV 1	HMW help the Government monitor poster activity without increasing staff workload?	<ul style="list-style-type: none"> <li>➤ Solar-powered surveillance cameras with motion detection flagging suspicious activity</li> <li>➤ Time-lapse monitoring kiosks highlighting new posters</li> <li>➤ Community digital alerts through WhatsApp groups for rapid reporting.</li> </ul>
	HMW use technology to track and identify offenders effectively?	<ul style="list-style-type: none"> <li>➤ QR code-based permit system linking posters to permit info</li> <li>➤ Geofencing alerts on poster printer deliveries logging unauthorized postings</li> </ul>
	HMW enable the community to report unauthorized posters quickly and accurately?	<ul style="list-style-type: none"> <li>➤ Citizen reporting app auto-tagging location/time</li> <li>➤ Gamified community participation incentivizing verified reports</li> <li>➤ QR verification enabling residents to report illegal posters directly</li> </ul>
POV 2	HMW encourage or require posters to carry contact or business information?	<ul style="list-style-type: none"> <li>➤ Mandatory QR codes on posters linking to business information</li> <li>➤ Pre-approved poster stickers</li> <li>➤ Digital registration portal requiring online business/poster registration</li> </ul>
	HMW make enforcement easier by creating a system to track the origin of posters digitally?	<ul style="list-style-type: none"> <li>➤ Central database logging poster QR/serial numbers</li> </ul>

		<ul style="list-style-type: none"> <li>➤ Printer-linked accountability logging each print and client</li> <li>➤ Geo-tagged posters for location tracking</li> </ul>
	HMW design incentives for businesses to display traceable information on their ads?	<ul style="list-style-type: none"> <li>➤ Verified advertiser badges for transparency</li> <li>➤ Discounted permit fees for posters with contact info</li> <li>➤ Digital analytics access showing poster reach</li> </ul>
<b>POV 3</b>	HMW create transparent rules that reduce political interference in poster removal?	<ul style="list-style-type: none"> <li>➤ Public digital permit ledger for decisions</li> <li>➤ Standardized poster size and zone policies</li> <li>➤ Automated removal queues minimizing human discretion</li> </ul>
	HMW foster community support for enforcement so that it is unbiased?	<ul style="list-style-type: none"> <li>➤ Public awareness campaigns on visual pollution</li> <li>➤ Gamified community reporting for peer accountability</li> <li>➤ Monthly community meetings for feedback</li> </ul>
	HMW implement a system for monitoring and penalizing offenders to reduce bias?	<ul style="list-style-type: none"> <li>➤ Tiered penalty mechanisms</li> <li>➤ Public dashboard listing violations</li> <li>➤ Anonymous tip and verification channels supported by photo evidence</li> </ul>
	HMW leverage technology to reduce reliance on manual monitoring while increasing coverage?	<ul style="list-style-type: none"> <li>➤ AI-enabled smart surveillance cameras</li> <li>➤ Night vision drone patrols capturing images</li> </ul>

<b>POV 4</b>		<ul style="list-style-type: none"> <li>➤ Time-lapse camera networks flagging visual changes</li> <li>➤ IoT-enabled public walls with sensors</li> </ul>
	HMW design a digital reporting system for citizens to help the government?	<ul style="list-style-type: none"> <li>➤ Citizen reporting mobile app with automatic metadata</li> <li>➤ WhatsApp/Telegram bot-based photo reporting</li> <li>➤ Gamified neighbourhood watch programs</li> </ul>
	HMW prioritize high-risk areas automatically so staff can focus efforts efficiently?	<ul style="list-style-type: none"> <li>➤ AI-generated heat maps of poster activity</li> <li>➤ Dynamic patrol scheduling based on real-time data</li> <li>➤ Predictive analytics forecasting high-risk zones</li> <li>➤ Automated alert systems dispatching staff</li> </ul>
<b>POV 5</b>	HMW promote the adoption of digital or eco-friendly advertising solutions for small businesses?	<ul style="list-style-type: none"> <li>➤ Shared municipal digital boards with low fees</li> <li>➤ Eco &amp; digital advertising workshops</li> <li>➤ Tax incentives and permit fee reductions</li> <li>➤ Pilot projects with free trials</li> <li>➤ Partnerships with printers and tech firms</li> </ul>
	HMW incentivize local businesses to replace traditional posters with sustainable options?	<ul style="list-style-type: none"> <li>➤ Green advertising tax credit</li> <li>➤ Premium visibility for sustainable advertisers</li> <li>➤ Recognition and awards programs</li> <li>➤ Subsidized printer upgrades</li> </ul>

	<p>HMW create allocated poster zones or digital boards that allow legal, and aesthetic advertising?</p>	<ul style="list-style-type: none"> <li>➤ Designated poster walls with murals and eco material guidelines.</li> <li>➤ Interactive digital kiosks replacing many posters</li> <li>➤ Eco-friendly billboard corridors with consistent signage</li> <li>➤ Community-curated ad spaces ensuring social acceptability</li> </ul>
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### 4.3 Value Proposition Analysis

From the solutions mentioned in Section 4.2, certain ideas were selected and integrated for further development of prototypes that is explained in chapter VI.

The early concept of **Biodegradable / Reusable Poster Program** reduced environmental waste and encouraged organized poster use through biodegradable and reusable designs. However, it did not address adhesive residue or complete wall cleanliness—leading to the creation of **EcoPeel**, which introduced a residue-free, peelable adhesive for truly clean and sustainable poster application. This was also inspired from ideas such as biodegradable/reusable poster programs, eco-friendly materials, and easy-clean wall solutions.

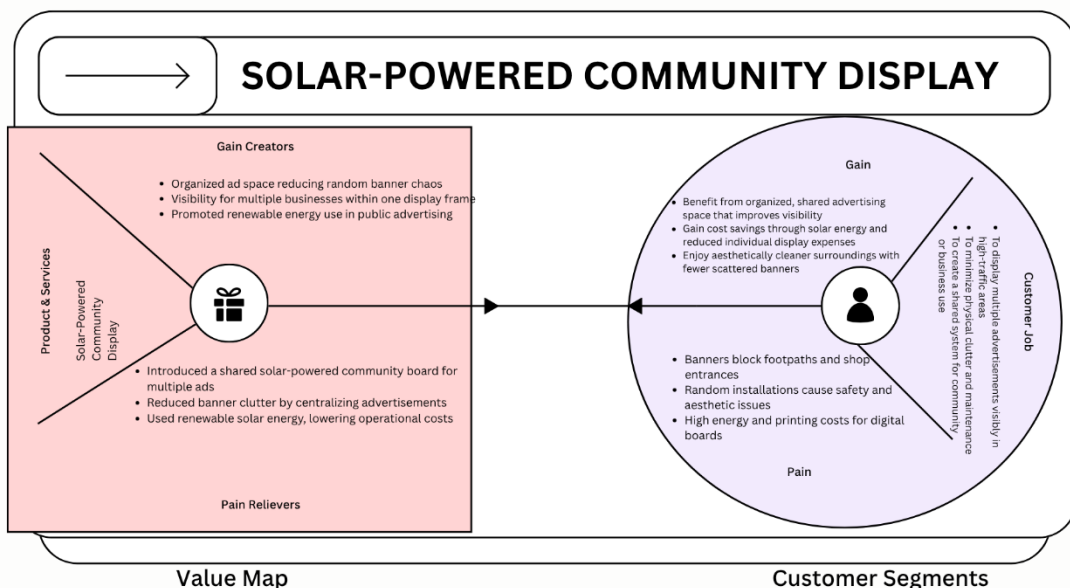
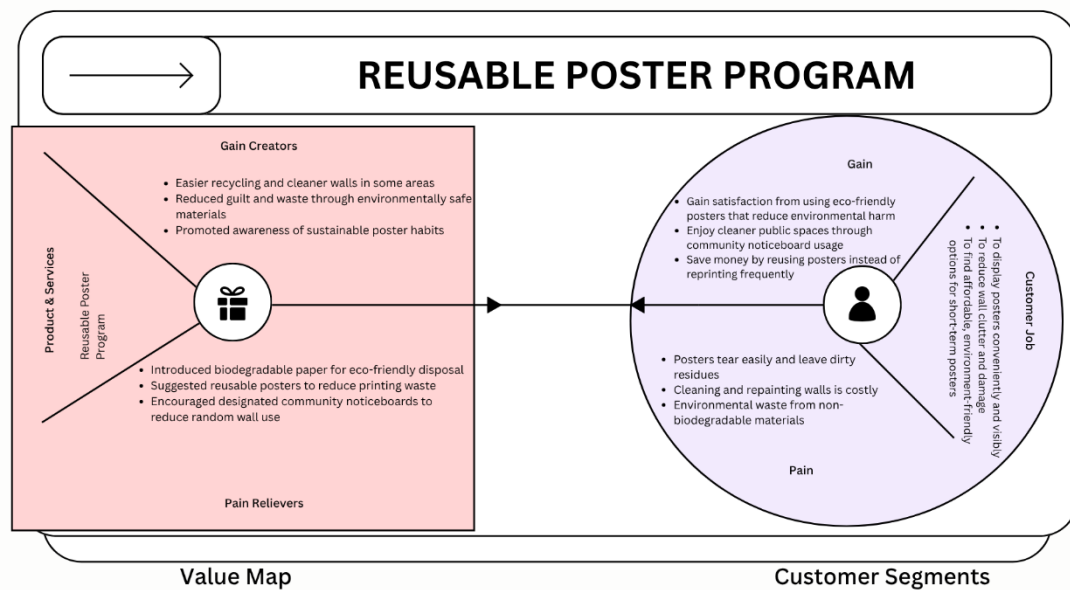
The early idea of **Solar-Powered Community Display** introduced the concept of a shared, solar-powered advertising system that promoted organization and sustainability. However, its static design lacked weather protection, vandal resistance, and long-term durability. These limitations inspired the refined **Vertical Scrolling Board (VSB)** with rotating banners, toughened glass protection, and modular components for sustained, clean, and eco-friendly advertising. It aims to reduce clutter by consolidating multiple ads into a single, rotating, solar-powered display system.

The ideas were chosen based on the following parameters:

- Feasibility
- Compatibility with legal and municipal frameworks
- Visual appeal and community acceptance
- Scalability



### 4.3.1 Value Proposition Diagrams



### 4.3.2 Value Proposition Matrices

#### 4.3.2.1 Biodegradable / Reusable Poster Program

Customer Need / Job	Biodegradable Paper	Reusable Poster Design	Community Noticeboard Concept
Display posters for events or announcements visibly	✓	✓	
Reduce wall damage and clutter		✓	✓

Lower cleaning and repainting costs			✓
Use environment-friendly materials	✓	✓	
Reduce waste generation	✓	✓	
Prevent unauthorized placements			✓
Ensure posters are easy to remove or replace		✓	

#### 4.3.2.2 Solar-Powered Community Display

<b>Customer Need / Job</b>	<b>Shared Display Space</b>	<b>Solar Power Source</b>	<b>Static Community Billboard</b>
Advertise multiple businesses visibly in public	✓		✓
Reduce clutter and visual pollution	✓		✓
Avoid blocking footpaths or shop entrances	✓		
Lower electricity or operational costs		✓	
Promote renewable energy use		✓	
Provide organized, communal ad spaces	✓		✓
Ensure continuous visibility and durability			
Resist weather and vandalism			

## CHAPTER V: PROTOTYPE

The fourth stage of the Design Thinking process is the prototype phase, during which intangible ideas are transformed into reality. Selected concepts from the Ideate phase are converted into conceptual and low-fidelity representations in to resemble real-world implementation. Visualizing and communicating how the solution may function in real-world situations is the goal rather than creating a finished product. Prototypes enable early validation, stakeholder input, and development before real implementation, bridging the gap between concept and testing.

### 5.1 Methodology

- **Objective:** Each prototype's goal was summarized and connected to stakeholder insights such as rural acceptability, eco-friendly materials, and aesthetic cleanliness.
- **Concept Sketching & Material Mapping:** To see the functioning model, initial sketches were created
- **Digital Visualization:** To convey functional concepts without the need for physical representations, 3D models and mechanism drawings were created utilizing software
- **Feasibility Rationalization:** To guarantee practical, scalable, and locally accessible designs, materials, expenses, and environmental effects were evaluated.

There was no attempt at practical production; instead, two prototypes were simply intended to be conceptual and visual models. They are the primary tools of communication used to illustrate the usefulness of the concepts.

### 5.2 Prototype 1: Eco Peel Poster Adhesive

#### 5.2.1 Concept

EcoPeel Adhesive Poster is a concept that aims to change the prevailing practice of using non-biodegradable, permanent posters for the promotion of a sustainable, detachable one. The adhesive is made from a water-based microsphere adhesive which is sourced from nature-derived starch and glycerine, and applied to biodegradable poster paper. The product allows posters to be put up and taken down easily, without leaving adhesive residues. The main point of this idea is to reduce the overflow of the street walls while giving an ecological and safe way of communication that also helps the local economy.

### 5.2.2 Advantages

The EcoPeel system provides multiple advantages that make it appealing for small-scale communication needs.

- The cost of the adhesive applied to a single A2 sized poster is likely less than ₹ 2.00 per poster. Thus, it is affordable for local vendors, small businesses, and community groups.
- Their environmental impact is as good as their economic performance. In contrast to vinyl or plastic flex, which remain as non-biodegradable wastes, the EcoPeel posters break down naturally, thus saving a lot of space in the landfill. Besides that, they become contributors to cleaner cities since the posters can be removed in a clean way when they are no longer needed.

### 5.2.3 Working Mechanism

The adhesive layer, made of acrylic copolymer microspheres in a water base, ensures proper adherence to painted, metal, or glass surfaces. The adhesive is applied with a roller or brush, shade-dried for 10–15 minutes, and easily removed without damaging surfaces or leaving stains.

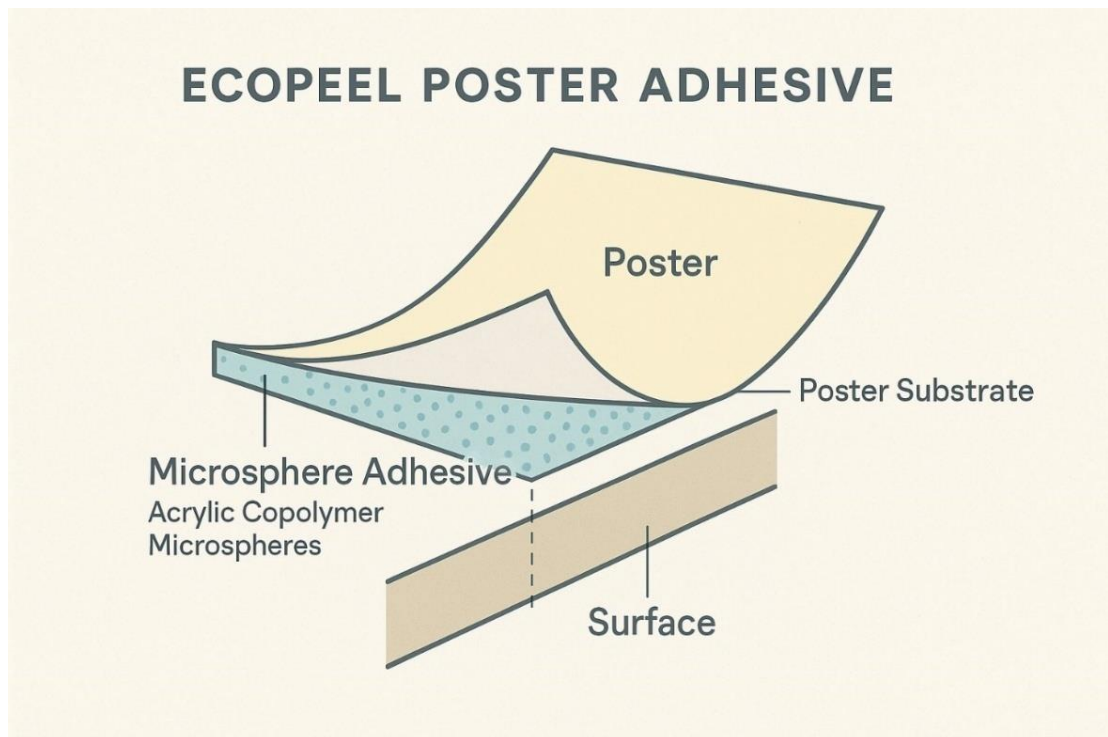
### 5.2.4 Prototype Materials

Component	Material	Purpose
Base Polymer	Acrylic copolymer emulsion (microsphere grade)	Low-tack adhesion
Tackifier	Gum resin ester (naturally sourced)	Outdoor weather stabilization
Solvent	Distilled water	Carrier medium
Plasticizer	Glycerine (food-grade)	Flexibility and softness
Additive	Natural starch / cellulose	Biodegradability and bulk
Preservative	Trace eco-friendly bio-cide/ Fungicide	Biological degradation prevention
Substrate	Recyclable poster paper	Eco-friendly base

**Note:** All materials are non-toxic, biodegradable, and locally manufacturable.

### 5.2.5 Procedure

- The first step in creating the EcoPeel adhesive prototype is to make sure the acrylic microsphere adhesive is safe and mild enough for low-tack use. Next, lightly apply adhesive to each poster's edges using a roller or brush, being careful to keep the application even and smooth. The posters must then be laid out to dry in the shade for 10–15 minutes, while the water-based adhesive forms its characteristic tacky surface.
- Allow it to dry, then test the adhesive on various surfaces, like painted walls, metal, and glass. This will ensure its compatibility with common surfaces in public areas. After 24 to 48 hours, peel off the poster to check if its removal is clean and residue-free, ensuring that the adhesive performs according to intentions for easy poster reusability and protection of surfaces.



### 5.2.6 Limitations

While conceptually strong, the EcoPeel prototype faces several limitations that prevent it from being a standalone solution. The most critical issue is legality. Even if the poster material is biodegradable, where people paste it still matters. Placing posters on private walls without consent remains defacement, and using public structures without authorization violates local regulations. Besides, aesthetic control also becomes a problem. This means the EcoPeel system doesn't inherently solve the issue of placement.

### **5.2.7 Suggestions and Feedback**

For the EcoPeel concept, the refinements primarily focused on improving its usability and environmental durability. Based on suggestions, the team proposed using slightly thicker biodegradable paper for better handling and multiple reuse cycles. The adhesive's properties were also refined conceptually to balance strength and peel ability, ensuring that the posters would remain intact on various indoor and semi-outdoor surfaces while still leaving no residue. The idea was further strengthened by emphasizing its potential use in educational campuses, noticeboards, and small businesses, where sustainability and reusability are highly valued.

## **5.3 Prototype 2: Vertical Scrolling Board (VSB)**

### **5.3.1 Concept**

The Vertical Scrolling Board (VSB) is a device that shows a newer and more complex method of solving the problem in the centre. It is a solar-powered mechanical display system that rotates automatically several printed posters on a single frame.

VSB made of galvanized steel or treated hardwood for the structural part, and recyclable HDPE or polycarbonate sheets for the display surfaces, works with a 12V low-RPM DC motor that gets its power from a 20–50W solar panel and 12V battery.

### **5.3.2 Advantages**

The VSB offers strong practical and environmental benefits.

- The reliability of this device is due to its simple low-maintenance electromechanical design that makes it very consistent with minimal technical staff. The effectiveness of this method is really impressive—just one VSB unit is capable of doing the work of several traditional banners and at the same time allowing the timed or scheduled ad rotation.
- The vertical and rotating movement is a natural eye-catcher and is perfect for open spaces like markets, roundabouts, or festival grounds. The source and shape of VSB are quite strong, thus resisting various weather conditions.
- VSB is modular in its maintenance as parts such as the motor, rollers, or sheets can be replaced separately, thus keeping the system viable for the longer period of time and lessening the time for the operations stop. Being fully solar-powered, it does not have any running energy costs and supports Tamil Nadu's renewable energy goals.

- The VSB is a tool for aesthetic coherence. A single organized board can be used for community notices, government campaigns, and local advertisements in rotation, thus maintaining order and cleanliness.
- One of the main advantages of VSB is that it eliminates the need for random banner installations by consolidating several advertisements in one organized display, thus also reducing visual clutter and enabling continuous operation for more than eight hours a day. This solution is in line with the increasing demand for energy-efficient, community-driven advertising systems.

### **5.3.3 Working Mechanism**

The Vertical Scrolling Board (VSB) has a photovoltaic panel on the top of the apparatus, which changes the solar energy into electric energy that is directed by a charge controller to a 12 V battery. The controller delivers the power steadily from the battery and protects it against overcharging and other electrical faults, thus allowing VSB to operate even in low-sun periods.

Electricity stored in the battery is used to turn a low-speed 12 V DC motor which, by a simple gearbox or belt drive, upper and lower rollers thus bands are wound on and unwound from them. The upper roller is used for unwinding the band slowly and gently while the lower roller rolls it up; a synchronization mechanism (dual-roller coupling or geared drive) assures that both sides are moving at the same speed to avoid the stretching, wrinkling or slippage of the band. The banner plays on a two-faced spool system so that one side of the image can be displayed or both sides can be shown consecutively without any interruption.

Moreover, the electrical installations are done using proper insulation and routing of the wires into a locked service compartment to protect the components from the vandalism, moisture and mechanical damage. The user control panel contains a manual ON/OFF switch, and mode selection (e.g., continuous rotation, timed rotation, or step/hold) buttons thus the operators can establish the working hours of the display without needing complicated controls. Safety interlocks and fuse protection elements are also incorporated in the electric circuit to keep the equipment safe from overloads.

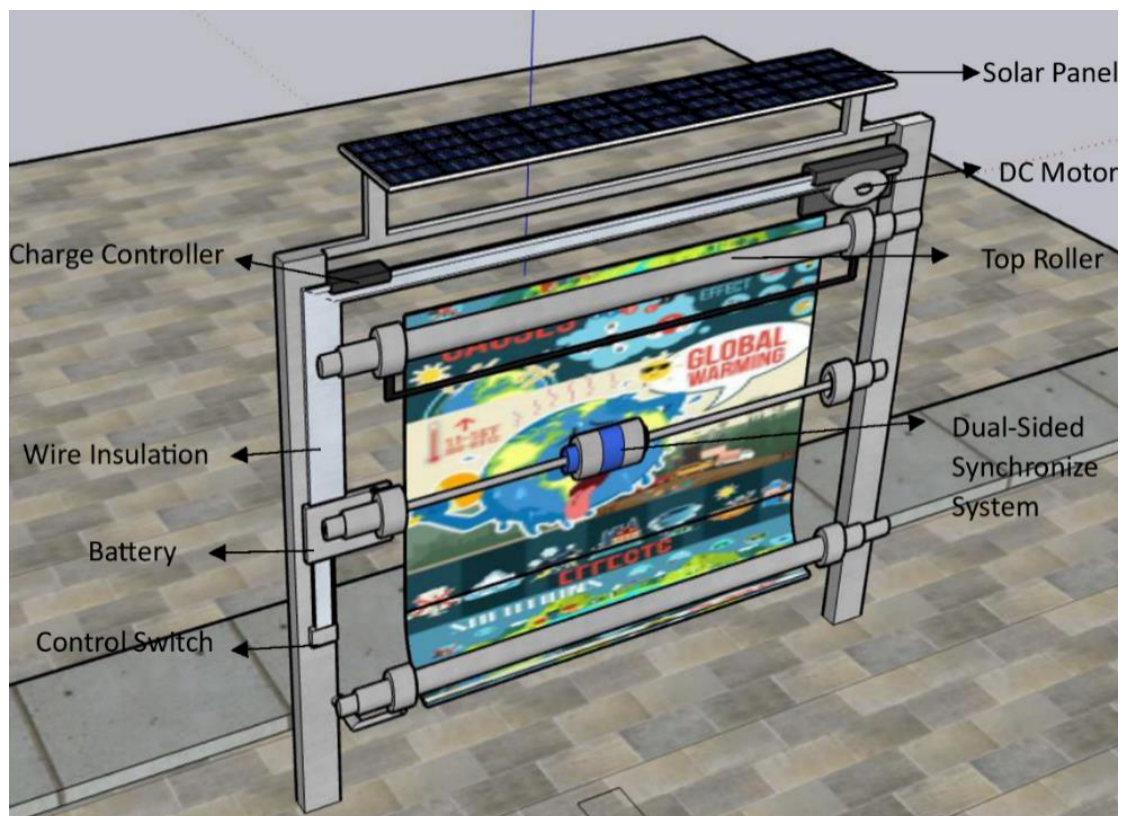
The frame of the VSB is composed of modular elements that can be resized to meet the requirements of different locations. The frame of galvanized steel and banner guides

made of recyclable HDPE or polycarbonate makes VSB modular and durable. In general, the system is planned as low in maintenance, solar independent in its operation, and capable of constant use by the public in outdoor areas.

#### 5.3.4 Prototype Materials

Component	Material	Purpose
Frame Structure	Galvanized steel / treated hardwood	Strength, rust resistance, aesthetic integration
Rollers	PVC pipes	Semi-automatic banner rotation
Display Sheet	PVC/Vinyl sheets	Affordable
Bearings	Sealed ball bearings	Smooth motion
Motor	12V Low RPM DC Motor	Controlled rotation
Power	20–50W solar panel and 12V battery	Sustainable energy source

**Note:** All materials are recyclable, weather-resistant, and suited for Indian outdoor conditions.





### **5.3.5 Limitations**

Despite its innovation, the VSB faces some realistic constraints. Cost is the first issue that comes to mind. The setup is going to cost some money upfront with the solar panel, battery, motor, and frame. So it might be quite a hefty sum. Since a single board can only replace two or three banners, there might be at least five boards necessary in a small locality, thus the cost of the early stage of deployment will be high.

### **5.3.6 Suggestions and Feedback**

For the Vertical Scrolling Board (VSB), the refinements concentrated on making the design more practical, cost-efficient, and adaptable to semi-urban and community environments. Instead of large-scale mechanical systems, simpler automation methods were suggested to make maintenance easier and cost-effective. Material options recyclable HDPE or polycarbonate sheets were suggested to replace PVC and vinyl sheets for durability and Aluminium/PVC rollers ensuring smooth banner rolling, while the overall structure was envisioned to be modular so that damaged parts could be replaced independently. The conceptual refinements reinforced VSB's role as a centralized, solar-powered banner display system, ideal for markets, community entrances, or public events — providing cleaner, more organized alternatives to scattered banners.

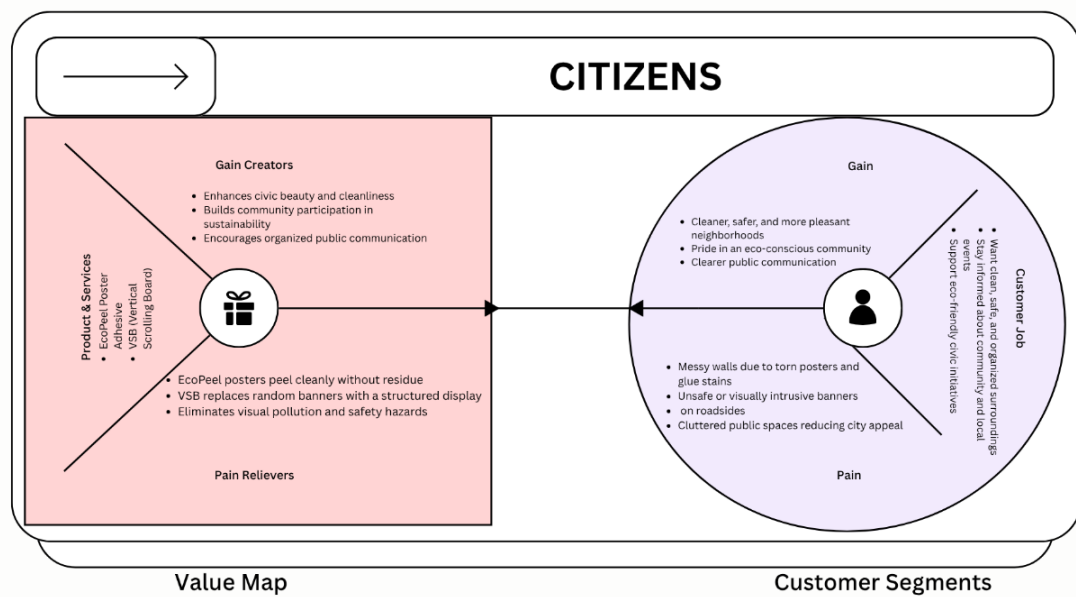
## **5.4 Feasibility**

Visually polluted rural areas in Tamil Nadu can benefit from the meaningful contributions of both prototypes. The EcoPeel Poster acts as a community-friendly means of communication in villages through biodegradable educational campaigns and short-term announcements. One may consider it as an affordable option if a municipal permit system is in place. On the other hand, the Vertical Scrolling Board is a trendy, environment-friendly, and technologically sustainable solution that can be utilized in main roads, markets, and urban intersections areas. Although it may have a higher installation cost, it provides a long-term, professional, and controlled advertising solution for the public. When these two mechanisms are intertwined under the supervision of the government, they constitute a comprehensive model for less polluted, more aesthetic, and eco-friendly communication spaces. In essence, since these two systems coexist, there is a reminder of the equilibrium between urban communication needs and the rural aesthetic that is conserved, thus, rural Tamil Nadu being able to expand further without losing its visual harmony.

## 5.5 Value Proposition Analysis

For the solutions given, value proposition diagrams and matrices for each stakeholder group was drawn, highlighting how each proposed solution addresses their specific needs and pain points. A sample value proposition diagram and value proposition diagram is placed to show a clear visual and analytical view of the prototypes introduced. This ensures that prototype concepts are directly grounded in the expectations and realities of the people most impacted by visual pollution and its solutions.

### 5.5.1 Sample Value Proposition Diagram – Citizens



### 5.5.2 Sample Value Proposition Matrix - Citizens

Product Feature	Reduces clutter/visual pollution	Supports ethical, legal advertising	Affordable and accessible	Preserves aesthetics and cleanliness	Encourages eco-conscious behaviour	Creates business/community opportunities
EcoPeel – Peelable eco-glue (micro-sphere adhesive)	✓		✓		✓	
EcoPeel – Recyclable		✓		✓		✓

poster material						
EcoPeel – QR-coded government approval system	✓		✓		✓	
EcoPeel – Collection & recycling by Self Help Groups (SHGs)		✓		✓		✓
VSB – Solar-powered rotating digital board	✓		✓		✓	
VSB – Pre-booking slots for posters		✓		✓		✓
VSB – Minimal cost for display time	✓		✓		✓	
VSB – Maintained by municipality		✓		✓		✓

## CHAPTER VI: TESTING

The testing phase is the last phase in the Design Thinking project which validates the ideas and solutions put forth in, namely the Vertical Scrolling Board (VSB) and EcoPeel Poster System. By using input received from students and university staff, this stage attempted to assess the ideas' overall impact, reliability, and feasibility. Examinations of usability, clarity, practicality, and eco-aesthetic value were the primary purposes of the testing.

### 6.1 Methodology

- **Participants:** Two faculty members from the School of Computing and five university students from diverse backgrounds were approached.
- **Approach:** A short presentation was conducted, showcasing the prototypes digitally via slides.
- **Feedback Tools:** Opinions were collected through informal conversation.
- **Criteria for Evaluation:** Each prototype was assessed by participants based on its appearance, sustainability, creativeness, clarity, and simplicity of maintenance.

### 6.2 Feedback

#### 6.2.1 Faculty Feedback (2 Staff):

The faculty appreciated the thoughtfulness and creativity behind the EcoPeel and Vertical Scrolling Board (VSB) prototypes. Both ideas demonstrated strong environmental awareness and design sensitivity — EcoPeel promoting sustainability through biodegradable materials and clean removability, and VSB attempting to organize banner displays in a visually cohesive way. The prototypes reflected genuine effort to combine aesthetics with practicality, and were recognized as steps toward more responsible outdoor advertising practices.

However, the expert review also highlighted a key limitation: neither prototype could effectively control the issue of unregulated poster placement. While EcoPeel reduced wall damage, it still allowed users to paste posters in unapproved areas, and the VSB system, though structured, required high setup and maintenance costs that limited its reach. The feedback emphasized that without a traceable and regulated framework, even well-designed physical solutions would fail to ensure compliance. This observation ultimately inspired the team to develop a more comprehensive Designated Poster

Zone and QR-based monitoring system, integrating municipal oversight with community participation to create a sustainable, enforceable model.

### 6.2.2 Student Feedback (5 Students):

Students were quite positive and enthusiastic about the EcoPeel adhesive prototype and considered it very close to their daily life experiences. A lot of them pointed out that poster residues and wall damage are the most common problems in hostels and notice-board areas, which made the product both a convenient and a significant one. The prototype was seen as a very small but very influential move to a lifestyle of sustainability in the education and community environment.

Another product, The Vertical Scrolling Board (VSB), got also some good remarks from the students because of its design that looked both futuristic and aesthetic. They said it was an innovative idea that could change traditional public information advertising. Some of them even went further to say that the VSB could become a hybrid or digital noticeboard, especially in the locality centre or campus where many functions are conducted simultaneously. Though they saw it as something with great potential, they also pointed out that the large-scale installation of it might only be possible in well-organized, crowded places because of the high cost and maintenance.

### 6.3 Prototype Evaluation

Both the prototypes demonstrate different sets of qualities and defects. The EcoPeel poster system is characterized by low price, adaptability, and simple manufacturing, and the VSB is distinguished by solidness, automatization, and aesthetic harmony. EcoPeel is fit for short-term, local communication, and VSB is fit for long-term, community-level advertising. The table below summarizes their comparative performance across the evaluation parameters:

Parameter	EcoPeel Poster	Vertical Scrolling Board (VSB)
Cost Effectiveness	Affordable and can be made locally	High upfront cost, low running cost
Reliability	Fair; limited lifespan	Good; stable functioning
Efficiency	Work done by hand	Machine-controlled scrolling and rotation
Visibility	Limited by viewer's focus	Very accessible to the public

Scalability	Can be scaled without any problem	Dependent on cost and infrastructure for scaling
Maintainability	Easy but frequent handling	Well-planned, periodic maintenance
Weather Resistance	Not suitable for outdoors	Durable due to product design
Mobility	Can easily be carried from one place to another	Permanently fixed

#### 6.4 Proposed Public Advertising Regulation System

Municipality can introduce a designated Display System to public advertising to bring safety, order, and accountability. This system will separate the use of posters from that of banners and it will also ensure that both are utilized in a way that beautifies the community.

Banners under this program will only be allowed on Vertical Scrolling Boards (VSBs) that are installed and managed by the municipality. These boards will serve local businesses for commercial advertisements, especially for local shops and businesses. It will be located only in the designated banner zones so that no obstruction or accidents can arise from them. In case of ceremonies or sudden personal events, no use of banners will be made but only temporary posters for the short period of visibility.

Posters are allowed to be displayed in officially designated poster zones only. Citizens, businesses, and organizations are obliged to utilize EcoPeel posters as these can be removed from the surface without leaving any residue and can be reused, thus ensuring both are clean and sustainable. Each poster will have a QR code issued by the municipality that includes information about the poster owner, the approval number, and the expiration date. The QR code scanning serves as a way of checking whether the poster is authorized and still in force. Presence of posters with no QR codes or posting beyond the expiration date will be considered as illegal and liable for fines.

To raise the sense of public obligation, the municipality can institute a reward and penalty system. The people who spot and report posters put up in unauthorized places or expired posters, will gain small rewards such as civic points, coupons, or a mention, whereas offenders will be fined. Besides that, the ones who put up posters are also

obliged to take them down after their expiration date, thus ensuring from beginning to end the presence of a sense of accountability.

The program restructures outdoor advertising as well as bringing traceability to it. In addition, it allows citizens and shop owners to be empowered and at the same time responsible for the cleanliness of public spaces as well as the correct utilization of these spaces in terms of visual balance. Eventually, it leads to a self-regulating system where ethics, aesthetics, and civic responsibility jointly act to put an end to the visual pollution problem in a sustainable way.

## **CHAPTER VII: CONCLUSION**

### **7.1 Overview**

The “Reimagining Public Advertising: A Design Thinking Approach to Visual Cleanliness” initiative utilized the Design Thinking methodology to tackle the increasing concern of use of posters and banners within rural and semi-urban spaces. The investigation demonstrated the ability of human-centered design to reconcile communication of culture and environmental stewardship to bring forth practical and sustainable results.

### **7.2 Important Insights**

Empathize and Define stages revealed the diversity of stakeholders' views, including those of citizens, shopkeepers, newsvendors, and officials. Since posters are communicative and culturally significant symbols, their unchecked proliferation creates visual clutter and dilutes aesthetic content of the area.

### **7.3 Prototyping Results**

Under Ideation and Prototyping, the team proposed two sustainable solutions: the Eco-Peel Poster System, which advocates reusable and residue-free communication, and the Vertical Scrolling Board (VSB), which centralizes banners into a clean, orderly display. They both maintained the cultural essence of information sharing but kept it both ecological and orderly.

### **7.4 Testing and Validation**

Experiments by the students and faculty verified the viability, creativity, and acceptability of these alternatives. Response showed the capacity of cleaner alternatives to substitute poster habits without interfering with locals' communication habits, aesthetics, and civic responsibility.

### **7.5 Reflection and Closing Comments**

The project reaffirmed the idea that Design Thinking is empathy in action, a methodology converting comprehension into innovation. In resolving environmental requirements and human values, the team re-imagined public spaces as balanced ecosystems where communication, culture, and sustainability coexist. Ultimately, the project conveys a clear message: thoughtful design can turn everyday problem like excess posters on walls into opportunities for cleaner, smarter, and more beautiful communities.



## **7.6 Future Scope**

To enhance effectiveness and sustainability in the management of public advertising, a number of key directions are suggested for future development.

The current system should be expanded to offer QR code permits for all public displays. This will, with the addition of digital monitoring and rewards for community reporting, ensure stricter enforcement, better traceability of advertisements, and further encourage citizens to take part in maintaining cleanliness in public areas.

Both EcoPeel and VSB solutions could be improved by adding automated poster/banner removal features. By engaging local businesses in maintenance and operation, these systems will have the added benefit of new economic opportunities, making upkeep easier while encouraging broader community-wide adoption.

There is a need for more studies that focus on scalability, reduction in costs, and adaptability of the found solutions in various urban and rural contexts. Research should focus on technical performance, community acceptance, and long-term affordability to ensure successful implementation at larger scales.

These future efforts will build a strong, responsive public advertising framework that balances sustainable innovation with community needs and regulatory oversight.

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## APPENDICES

- Empathize Phase Questionnaire  
[https://drive.google.com/file/d/1cLHBHmg2oXk-mIAIP4xnCgWKC8RzgILfH/view?usp=drive\\_link](https://drive.google.com/file/d/1cLHBHmg2oXk-mIAIP4xnCgWKC8RzgILfH/view?usp=drive_link)
- Capture Grids  
[https://drive.google.com/file/d/1QP-ucJwGnvAvkMrU68Wd15a-8wWDALnM/view?usp=drive\\_link](https://drive.google.com/file/d/1QP-ucJwGnvAvkMrU68Wd15a-8wWDALnM/view?usp=drive_link)
- Value Proposition Diagrams  
[https://drive.google.com/drive/folders/1w9ZfmUQCWJ6mwt-xoIWjvv\\_J2Iqx-SARQ?usp=drive\\_link](https://drive.google.com/drive/folders/1w9ZfmUQCWJ6mwt-xoIWjvv_J2Iqx-SARQ?usp=drive_link)
- Value Proposition Matrices  
[https://drive.google.com/file/d/1HywXYsgNQhdSFD6knVscqtuC-HN8HPcx/view?usp=drive\\_link](https://drive.google.com/file/d/1HywXYsgNQhdSFD6knVscqtuC-HN8HPcx/view?usp=drive_link)
- Prototype Models  
[https://drive.google.com/drive/folders/1ay3DfEOp-MAYVV55I2\\_43AFIK6KzCqk6M?usp=drive\\_link](https://drive.google.com/drive/folders/1ay3DfEOp-MAYVV55I2_43AFIK6KzCqk6M?usp=drive_link)
- Ideate Phase  
[https://drive.google.com/file/d/1KcZgZpmKPQsXx2jgmcVM68Pp7k7A-Pd\\_/view?usp=drive\\_link](https://drive.google.com/file/d/1KcZgZpmKPQsXx2jgmcVM68Pp7k7A-Pd_/view?usp=drive_link)