UrbanNa: Urban Issue Reporter Proposal

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Abstract: UrbanNa is a crowdsourced urban issue reporting platform that enables citizens to document infrastructure problems using geotagged photos and severity ratings, while providing city officials with actionable insights through interactive dashboards. The platform employs a lightweight machine learning model to validate reported severity levels and creates visual representations of issue concentrations across urban areas. Through innovative gamification features including badges, XP, and community impact scores, UrbanNa drives sustained citizen engagement and fosters a sense of community responsibility. By bridging the communication gap between residents and local authorities, UrbanNa streamlines the identification, prioritization, and resolution of urban infrastructure problems, ultimately leading to more responsive governance and improved quality of urban life.

Goal: UrbanNa aims to simplify and accelerate the process of reporting and resolving urban infrastructure issues by creating a centralized platform where citizens can easily document problems while providing officials with the data needed to make informed decisions about resource allocation. Specifically, the system will help users identify and report issues like potholes, broken streetlights, fallen trees, and other urban infrastructure problems, track the status of their reports, and visualize problem patterns across their community.

Current Practice: Currently, urban issue reporting relies primarily on fragmented systems such as:

1. Phone-based services that often involve long wait times and lack visual documentation
2. Department-specific reporting channels that confuse citizens about where to direct specific issues
3. Email or paper-based systems with limited tracking capabilities
4. Separate channels for reporting different types of problems but no one integrated place to do so

These approaches suffer from siloed information, inconsistent follow-up, lack of transparency in the resolution process, and the absence of actionable data analytics to guide resource allocation. Without a unified system, officials struggle to prioritize issues effectively, while citizens become frustrated by unclear communication and seemingly ignored reports.

Novelty: UrbanNa introduces several innovations to urban issue reporting:

1. **Severity Validation Model**: Unlike existing platforms that take severity ratings at face value, our machine learning component analyzes submitted images to verify if the reported severity matches visual evidence, improving data reliability.
2. **Dual-Dashboard Approach**: We provide citizens with the same category distribution and heat map visualizations that officials see, creating transparency and shared understanding of community priorities.
3. **Gamification System**: UrbanNa incorporates engagement mechanics including badges, XP, and community impact scores that reward active participation and create intrinsic motivation for ongoing civic engagement.
4. **Unified Analytics**: By consolidating reports across all infrastructure categories, our platform enables cross-departmental insights and resource coordination that current siloed systems cannot deliver.

Rather than simply digitizing the existing 311 process, UrbanNa transforms urban issue reporting into a collaborative data ecosystem that benefits both citizens and officials through shared insights, transparent resolution tracking, and rewarding engagement mechanics.

Effects: If successful, UrbanNa will benefit multiple stakeholders:

1. **Citizens** will experience faster issue resolution, greater transparency in government operations, increased agency in improving their communities, and the satisfaction of recognition through the gamification system.
2. **City Officials** will gain data-driven insights for resource allocation, improved ability to identify recurring problem patterns, and better citizen satisfaction through more responsive governance.
3. **Urban Planners** will access valuable historical data to identify systemic infrastructure weaknesses that require longer-term solutions.
4. **Communities** will benefit from safer infrastructure, decreased hazards, and stronger civic engagement driven by the platform's social and gamified elements.

The aggregated data from UrbanNa will enable cities to shift from purely reactive maintenance to more proactive infrastructure management, potentially reducing long-term costs while improving service delivery. Additionally, the gamification system will help maintain user engagement over time, ensuring a consistent flow of reports rather than the initial surge followed by drop-off that plagues many civic applications.

Technical Approach: UrbanNa will be implemented as a mobile application with responsive design, built on the following technical stack:

1. **Frontend**: A cross-platform framework (e.g., Flutter, React Native) in order to reach more users
2. **Backend**: Node.js with Express
3. **Database**: A NoSQL database (e.g., MongoDB)
4. **Machine Learning**: Simple ML model to validate images according to severity
5. **Github** for Version Control

Risks: The most significant technical risk is developing an effective machine learning model for severity validation within our 9-week timeframe. Training a model that can accurately assess diverse infrastructure issues across varying lighting conditions, weather, and image qualities presents a substantial challenge.

To mitigate this, we will start with a simplified model focused on binary classification (valid infrastructure issue vs. non-infrastructure content) rather than attempting full severity validation immediately. Then we will pursue a phased approach, initially launching with basic image validation and adding more sophisticated severity assessment in later iterations.