**PipAR: A QR Code-Based Augmented Reality Pipe Mapping Mobile Application**

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**EXECUTIVE SUMMARY**

PipAR is an innovative QR code-based augmented reality (AR) pipe mapping mobile application designed to address the challenges faced by homeowners, construction professionals, and maintenance personnel. By leveraging AR technology, PipAR simplifies the identification of water pipe locations, reducing the need for invasive inspections and minimizing property damage. Users can scan a QR code placed at the entrance of a house to dynamically access and visualize the pipe layout, overlaying it on walls, floors, and ceilings in real time. This cost-effective solution empowers users with efficient maintenance tools and sustainable practices.

With its unique approach, PipAR eliminates guesswork during inspections, reduces unnecessary repairs, and promotes eco-friendly practices. The application’s integration of modern technologies ensures its adaptability to future advancements, providing users with a long-term solution for pipe mapping and maintenance needs. PipAR is set to revolutionize the way water pipe layouts are accessed and visualized, empowering communities and professionals with a user-friendly, accessible, and efficient tool.

**COMPANY OVERVIEW**

**COMPANY PROFILE**



Figure 1. Company Logo

QWERTY Solutions is a forward-thinking technology company focused on creating practical solutions to everyday challenges. One of its key ventures is PipAR, a mobile application designed to revolutionize water pipe mapping through the use of augmented reality. By integrating cutting-edge technologies like QR codes and AR, QWERTY Solutions aims to deliver accessible and innovative solutions for homeowners and professionals alike.

**HISTORY AND BACKGROUND**

The idea for QWERTY Solutions was born from the collective vision of three technology enthusiasts, each bringing their unique expertise to tackle real-world problems. The team’s commitment to innovation and user-centric design is evident in its flagship product, PipAR, which addresses a critical gap in property maintenance solutions. By combining advanced technologies with an intuitive interface, the company ensures that its products remain accessible and beneficial to users from all walks of life.

**MISSION**

To empower communities and professionals with innovative, technology-driven solutions that simplify everyday challenges and promote sustainable practices.

**VISION**

To be a global leader in user-centric technology solutions, setting new standards for innovation and sustainability.

**GOAL**

To create accessible and efficient technological tools that address pressing community needs while fostering environmental responsibility.

**EMPLOYEE PROFILE**

QWERTY Solutions thrives on the expertise of its founding members, who bring diverse skills and a shared vision for transforming everyday challenges into opportunities for growth and innovation.

Position Name Duties and Responsibilities Founder/CEO **Jamir Hernandez** oversees strategic direction, growth, and product development for QWERTY Solutions and PipAR. Co-Founder/CTO **Sean Amorante** leads technological innovation, ensuring the integration of cutting-edge solutions into the company’s products. Co-Founder/CMO **Christian Abiog**, develops and implements marketing strategies to promote PipAR, focusing on user engagement and brand growth.

**PRODUCT OVERVIEW**

**INTRODUCTION**

PipAR is a QR code-based augmented reality pipe mapping application that addresses the common challenges of identifying water pipe layouts in properties. Designed for homeowners, construction professionals, and maintenance personnel, PipAR provides a user-friendly platform to dynamically access and visualize water pipe layouts. By scanning a QR code at a property’s entrance, users can interact with a real-time, AR-powered overlay of the pipe system, enabling efficient maintenance and inspection processes.

**PROBLEM STATEMENT**

Water leakage and pipe-related issues are prevalent challenges that often result in unnecessary property damage, high repair costs, and time-consuming troubleshooting. Many properties lack accessible and up-to-date plumbing layouts, leaving homeowners and professionals to rely on outdated blueprints or guesswork. Current solutions fail to integrate modern technology, making them impractical for real-time application. These limitations have created a pressing need for a modern, intuitive, and efficient solution to streamline the maintenance of water pipe systems.

**SOLUTION**

PipAR offers an innovative solution by integrating QR code technology with augmented reality to dynamically visualize water pipe layouts. Users can scan a QR code to access real-time overlays of pipe systems on their property, eliminating the need for invasive inspections. The application also supports offline access, ensuring usability even in areas with limited connectivity. With features like layout updates and interactive navigation, PipAR empowers users to efficiently manage pipe-related issues with minimal disruption and cost.

**MARKET ANALYSIS**

**Product Market Boundaries and Structure**

PipAR operates within the intersection of construction technology, property management solutions, and augmented reality (AR) tools. The boundaries of this market include applications and services that aim to streamline maintenance, property visualization, and troubleshooting for residential and commercial infrastructures. The market structure can be categorized into:

* Primary Solutions: AR-based mapping and visualization tools for pipe layouts.
* Secondary Solutions: Plumbing management software, traditional blueprints, and manual inspection services.
* Adjacent Technologies: Smart home integrations and IoT-enabled devices for maintenance.

**End-Users**

**PipAR caters to two distinct but interconnected groups:**

1. Primary Users: Homeowners, maintenance personnel, and real estate developers who directly benefit from its functionality.
2. Investors (Engineers and Contractors): They serve as both users and business partners, as they implement PipAR within their projects for increased efficiency and profitability. This creates a symbiotic relationship, wherein their adoption of PipAR enhances their service offerings to clients while reducing operational costs.

**Industry**

The industry context for PipAR is construction and property management in the Philippines, characterized by rapid urbanization and increasing demand for efficient, sustainable, and tech-driven solutions.

**Key trends influencing this industry include:**

* Growth of Smart Homes: Rising interest in integrated technology solutions for homes and properties.
* Sustainability Goals: Preference for solutions that reduce waste and promote efficient resource usage.
* Construction Technology Adoption: Increasing adoption of AR and digital tools in the construction sector.

**Local Opportunities:**

* Housing Market: The Philippine housing backlog remains a significant issue, with government and private developers continuously building residential units.
* Infrastructure Modernization: With increasing infrastructure projects, the demand for innovative maintenance tools is growing.
* Rising Awareness of AR: While still an emerging technology in the Philippines, AR has gained traction due to its use in gaming and education, paving the way for its adoption in practical applications like PipAR.

**Key Competitors**

Although PipAR offers a unique value proposition, competition arises from:

1. Traditional Solutions:
   * Paper blueprints or digital diagrams.
   * Manual inspection and troubleshooting methods.
2. Emerging Technologies:
   * Plumbing-focused management apps with less emphasis on AR.
   * Smart home platforms offering IoT integration (e.g., sensors for pipe leaks).

Differentiators of PipAR:

* Real-time AR visualization via QR codes.
* Offline access and the ability to update layouts dynamically.
* Cost-effectiveness and environmental responsibility.

**Market Size Estimation**

Philippine Market Overview: The Philippines is experiencing steady growth in its construction and property management sectors due to rapid urbanization and increasing investments in housing and infrastructure.

* Residential Construction Industry Value (2023): PHP 700 billion, with annual growth rates of ~5%.
* Maintenance/Repairs Expenditure: PHP 60-80 billion annually, as residential and commercial properties continue to age and require upkeep.

**Potential Target Market for PipAR:**

1. Residential New Constructions:
   * Approximately 200,000 new residential units are built annually.
   * Targeting 10% adoption (~20,000 units), PipAR could generate PHP 4,000 per unit, resulting in PHP 80 million in potential revenue annually.
2. Retrofitting Existing Homes:
   * An estimated 15 million homes exist in the Philippines.
   * Targeting 3% adoption (~450,000 homes) at PHP 3,000 per unit, the retrofitting market could generate PHP 1.35 billion in potential revenue.
3. Commercial and Infrastructure Projects:
   * With the ongoing "Build, Build, Build" program and private infrastructure investments, approximately 30,000 commercial buildings and infrastructure projects are initiated annually.
   * PipAR can target 5% adoption (~1,500 projects) at PHP 50,000 per project, adding PHP 75 million annually.

**Projected Adoption by Contractors/Engineers:**

* The Philippines has over 10,000 active engineering firms and contractors.
* Assuming a 20% adoption rate (~2,000 firms), PipAR's annual subscription or licensing fees (e.g., PHP 25,000 per firm) could generate PHP 50 million annually.

Revenue Potential for Investors: Combining the residential, commercial, and engineering firm markets, PipAR's total addressable market (TAM) exceeds PHP 1.55 billion annually. With a gradual adoption rate starting at 5-10%, PipAR can realistically capture PHP 77.5 million to PHP 155 million annually within the first few years, with significant room for growth.

**Key Revenue Drivers:**

1. One-Time Setup Fees: For new installations or retrofits.
2. Subscription Model: Monthly or annual fees for contractors, engineering firms, and property managers.
3. Premium Features: Offering advanced analytics, cloud storage, and integration with IoT sensors.

By positioning itself as a cost-effective and innovative solution, PipAR has strong potential to disrupt traditional methods and carve out a sizable market share in the growing construction and property management industries in the Philippines.

**BUSINESS MODEL**

The business model for PipAR is designed to ensure accessibility and sustainability while delivering value to users. Revenue streams include:

* App Subscriptions: Tiered pricing plans for homeowners and professionals.
* One-Time QR Code Purchases: Affordable and customizable QR codes for property integration.
* Premium Features: Additional tools like layout customization and cloud backups.

**VALUE PROPOSITION**

"Your vision, realized through intelligent IT solutions, driven by QWERTY Solutions."

At QWERTY Solutions, we bridge technology and business by providing tailored IT solutions that simplify complex processes, drive efficiency, and boost productivity. With a focus on adaptability, customer-centric design, and secure, cutting-edge technologies, we empower businesses to scale and thrive in a digital world. Whether it’s through software development, cloud integration, or data management, QWERTY Solutions is committed to helping clients achieve their unique goals through tech that works for them.

**BUDGET ANALYSIS**

**Development Costs**

* App Development and Design: PHP 20,000 - PHP 30,000
* Database and Hosting Services: PHP 5,000 - PHP 10,000

**Marketing and Advertising Costs**

* Digital Advertising: PHP 10,000 - PHP 20,000
* Community Engagement: PHP 5,000

**Operational Costs**

* Customer Support Services: PHP 5,000
* Licensing and Legal Fees: PHP 3,000 - PHP 5,000

**Miscellaneous Costs**

* Contingency Fund: PHP 1,000 - PHP 5,000

**PRODUCTION PROCESS**

Planning and Feature Design The development process focuses on simplicity and functionality to ensure a seamless user experience. Key features include:

* QR Code Integration: For easy access to pipe layouts.
* Augmented Reality Visualization: To dynamically overlay pipe systems in real-time.
* Offline Access and Layout Updates: To enhance usability and adaptability.

**CONCLUSIONS**

PipAR represents a groundbreaking solution to the challenges of pipe mapping and maintenance. By integrating QR code and AR technologies, the application provides a user-friendly and efficient platform for visualizing water pipe layouts. With its focus on accessibility, sustainability, and future-proof design, PipAR has the potential to transform the way pipe systems are managed, empowering communities and professionals alike.