# Solution Report: Shire of Chittering Resident App

## Executive Summary

The Shire of Chittering, in collaboration with North Metro TAFE, is embarking on the development of a mobile application aimed at enhancing resident engagement and streamlining essential services. This report outlines two potential solutions: a native mobile app using Flutter and a Progressive Web App (PWA). Both solutions prioritize secure payment processing, real-time balance access, payment confirmation, and a push notification system. The report delves into business requirements, existing infrastructure, gap analysis, proposed solutions, impact analysis, and concludes with a recommendation for implementation.

## Project Overview

This project aims to develop a mobile application for the Shire of Chittering, led by CEO Melinda Prinsloo. The application will bridge the gap between the Shire and its residents by improving communication, information access, and streamlining service delivery.

**Project Focus:**

Our team will design and develop the app based on the core functionalities identified collaboratively with the Shire:

* Secure payment processing for various services
* Real-time access to account balances
* Payment confirmation receipts
* Robust push notification system for critical updates and alerts

**Project Deliverable:**

The final deliverable will be a user-friendly mobile application that empowers residents to conveniently manage their accounts, stay informed, and easily access essential services offered by the Shire.

## Business Requirements

**3.1. High-Level Objectives/Use Cases**

**Enhanced Communication:** Deliver timely and targeted information to residents through push notifications, fire alerts, and easy access to council announcements.

**Improved Service Access:** Empower residents to conveniently manage their accounts, view rate balances, process payments, and submit directly within the app.

**Use Cases:**

A resident receives a push notification about a planned and permitted fire in their neighbourhood and or any fires that can affect them.

Another resident logs in to the app to view their current rates balance and make a secure payment online.

**3.2. Relation to Strategic Plan**

The development of this mobile application aligns with potential strategic goals of the Shire of Chittering, as outlined in their 2022-2032 Strategic Community Plan:

**Connected Communities:** The app facilitates a direct communication channel between the Shire and residents, fostering a more informed and engaged community.

**Safe and Healthy Community:** Push notifications for critical updates (e.g., fire alerts) contribute to a safer and healthier community.

**3.3. Existing Website, Application, or Hardware Configuration**

**Existing Website:** The Shire of Chittering currently has a website, which utilizes Spark CMS deployed with CouncilConnect by Market Creations, a local company.

**Existing Application (Limited Functionalit**y): A basic prototype of the resident mobile application already exists and is yet to be deployed. It includes functionalities for displaying fire danger ratings and submitting problem reports. However, it lacks payment processing, account access, and push notifications. This prototype can serve as a foundation for further development.

## Gap Analysis/Opportunities

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| **Strengths**   * **Improved Communication:** The app facilitates direct communication with residents through push notifications, news updates, and easy access to council announcements. * **Enhanced Service Access:** Residents can conveniently manage accounts, view balances, process payments, and potentially submit requests (with future expansion). * **Reduced administrative burden:** Residents inquiries are streamlined through the app removing the need for a good proportion of administrative work by the shire’s staff. * **Leveraging Existing Systems:** Potential integration with BPOINT can streamline development and data flow. | **Weaknesses**   * **Development and Maintenance Costs:** Building and maintaining the app requires investment in development, resources, and ongoing updates. * **Data Security Concerns**: Robust security measures are essential to protect resident data privacy and prevent cyber threats. * **Reliance on External Systems**: Integration success depends on BPOINT and any other technical components collaboration and technical feasibility. * **Limited technical expertise**: Lack of technical expertise within the shire could potentially affect the app maintenance. |
| **Opportunities**   * **Improved Operational Efficiency:** The app can potentially reduce the need for phone inquiries and in-person visits, freeing up Shire staff time. * **Data-Driven Decision Making:** App usage analytics can provide valuable insights into resident needs and preferences to inform future initiatives. * **Enhanced Transparency and Accountability:** The app promotes transparency by providing residents with easy access to information and secure payment options. * **Future Expansion Potential:** The app's flexible architecture allows for adding features like pet registration. | **Threats**   * **Resident Adoption and Usage:** Encouraging residents to download and actively use the app requires a well-developed communication strategy. * **Technological Advancements**: The app needs to be adaptable to keep pace with evolving mobile technologies and resident expectations. * **Cybersecurity Threats:** The app needs robust security measures to mitigate data breaches and protect resident privacy. |

## Proposed Solutions

This report outlines two potential solutions for developing the Shire of Chittering's resident mobile application:

### Solution 1: Native Mobile App with Secure Integrations (Flutter)

**Technology Stack**: Flutter (cross-platform development framework), secure back-end server with database, BPOINT integration for payments, push notification service.

**Implementation:** User-friendly UI design, API development for BPOINT and potentially SynergySoft integration, push notification integration, robust security measures, thorough testing, and deployment.

**Benefits:** Faster development compared to separate native apps, cost-effective, high-performance, and responsive UI, easy maintenance.

**Drawbacks:** Learning curve for developers unfamiliar with Flutter.

This solution prioritizes speed, cost-effectiveness, and a high-quality user experience. It allows for seamless integration with BPOINT and potentially the Shire's existing systems.

### Solution 2: Progressive Web App (PWA)

**Technology Stack:** Web app development framework (React), service worker for offline functionality and push notifications, secure back-end server with database, BPOINT integration for payments.

**Implementation:** Responsive web app development, service worker integration, API development for BPOINT and potentially SynergySoft integration, push notification integration, deployment to Shire's web server and promotion.

**Benefits:** Most cost-effective solution, wider reach across devices without app store downloads, improved user experience with offline capabilities and push notifications, easy updates through the web.

**Drawbacks:** Limited functionality compared to native apps; offline functionality might be limited.

The PWA offers a cost-effective and widely accessible solution. However, it might have limitations in functionality compared to a native app.

## Payment Systems

Let us explore and compare two potential options for integrating payment processing into the Shire of Chittering Resident App: BPoint and Stripe. Payment systems play a critical role in facilitating secure transactions and enhancing user experience within mobile applications. BPoint is a well-established payment gateway known for its reliability, security, and familiarity, making it a practical choice for organizations already using the system. On the other hand, Stripe offers a broader international reach, innovative features, and developer-friendly tools, making it appealing for organizations seeking advanced payment solutions. Through this comparison, we aim to determine the most suitable payment solution that aligns with the Shire's objectives and requirements for the resident app.

**BPoint:**

**Advantages:**

**Integration:** BPoint integration can streamline development and data flow, reducing implementation time and effort, as the Shire is already familiar with the system.

**Security:** BPoint is known for its robust security measures, ensuring that residents' payment information remains secure during transactions, thereby building trust and confidence among users.

**Familiarity:** Integration with BPoint provides continuity and consistency in payment processing methods, making it easier for users to adapt to the new platform if they are already familiar with BPoint from the Shire's website.

**Cost-Effectiveness:** Depending on pricing structures and transaction fees, BPoint may offer a cost-effective solution for payment processing, especially because the Shire has an existing contract or agreement with the provider.

**Disadvantages:**

**Limited Flexibility:** BPoint may have limitations in terms of supported payment methods or customization options compared to other systems like Stripe, restricting the Shire's ability to provide a diverse range of payment options to residents.

**Stripe:**

**Advantages:**

**Global Reach:** Stripe supports payments in multiple currencies and countries, making it suitable for organizations with international users or customers, aligning well with the Shire's goal of reaching a broad audience.

**Developer-Friendly:** Stripe offers comprehensive documentation, developer tools, and APIs that simplify the integration process, reducing development time and effort.

**Innovative Features:** Regular updates and new features from Stripe ensure that the Shire can leverage cutting-edge payment solutions to enhance user experience and stay competitive.

**User Experience:** Stripe provides a smooth and intuitive payment experience for users, supporting various payment methods and digital wallets, enhancing user satisfaction and encouraging adoption of the app for payments.

**Scalability:** Designed to scale with businesses as they grow, Stripe accommodates increasing transaction volumes without compromising performance, making it suitable for the Shire's future expansion plans.

**Disadvantages:**

**Potentially Higher Costs:** While Stripe's pricing is competitive, it may have higher transaction fees compared to other systems, impacting the Shire's budget, especially with significant transaction volumes.

**Data Localization:** Storing payment data in Stripe's servers may raise concerns about data localization and compliance with local regulations, requiring additional measures to address.

## Impact Analysis

### The Business (Shire of Chittering):

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| Factor | Flutter App | PWA |
| Cost: | Moderate | Low |
| Development Time: | Moderate | Low |
| Reach: | Limited to app store users (Android & iOS) | Wider reach across all devices and platforms |
| User Experience: | Native app experience with high performance and responsiveness | App-like experience with potential limitations compared to native apps |
| Offline Functionality: | Can be developed for limited offline functionality | Can be developed for some offline functionality (cached data) |
| Maintenance: | Requires ongoing maintenance for app updates | Updates delivered through the web, reducing maintenance burden |
| Integration: | Seamless integration with BPOINT and potentially SynergySoft | Requires secure API development for BPOINT and potentially SynergySoft integration |

### The Team's Ability to Implement:

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| Factor | Flutter App | PWA |
| Development Skills: | Requires developers familiar with Flutter and back-end technologies | Requires developers familiar with web development frameworks and back-end technologies |
| Learning Curve: | Learning curve for developers unfamiliar with Flutter | Lower learning curve for developers familiar with web technologies |
| Development Time: | Moderate development time | Faster development time compared to a native app |
| Testing: | Requires thorough testing on various devices and operating systems | Requires testing across different browsers and devices |

### Effectiveness of the Project:

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| Factor | Flutter App | PWA |
| Meeting Core Functionalities: | High potential to deliver all core functionalities effectively | May have limitations depending on the complexity of functionalities |
| Time to Market: | Faster development compared to separate native apps | Fastest time to market |
| User Adoption: | App store visibility might affect adoption | Wider potential reach due to no app store download requirement |
| Scalability: | Can be easily scaled for future feature additions | Scalability might require more effort compared to a native app |

### Industry Standards and Practices:

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| Factor | Flutter App | PWA |
| Mobile App Development: | Flutter is a growing framework with increasing adoption | PWAs are a recognized approach for mobile-first web experiences |
| Security: | Both solutions can be implemented with robust security measures | Both solutions can be implemented with secure coding practices and data encryption |
| Offline Functionality: | While not standard, some native apps offer offline features | PWAs are increasingly incorporating offline functionality for improved user experience |

## Conclusion with Recommendation

### 7.1. Conclusion

After thorough analysis, it is recommended that the Shire of Chittering proceed with the development of a native mobile app using Flutter. While both solutions offer advantages, the Flutter app provides a more seamless user experience, faster development time, and easier integration with existing systems like BPOINT. Additionally, the native app approach aligns better with the Shire's objectives for enhanced communication and service accessibility. With proper implementation and ongoing support, the Flutter app can effectively meet the Shire's needs and contribute to improved resident engagement and service delivery.

### 7.2. Recommendation

Given the specific needs and context of the Shire of Chittering, BPoint emerges as the preferred payment solution over Stripe. BPoint offers a familiar, secure, and cost-effective payment gateway that aligns seamlessly with the Shire's existing infrastructure and objectives for the resident app. Its integration potential with the Shire's systems, along with its reliability and familiarity, make it a practical choice. While Stripe offers global reach and innovative features, its potential higher costs and data localization considerations pose challenges that may outweigh its benefits in this context. Therefore, the adoption of BPoint is recommended to ensure a smooth and efficient payment experience for residents, ultimately enhancing engagement and service delivery.

## 8. Supervisor Sign-Off