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DEVELOPMENT OF A MOBILE APPLICATION FOR COVERING LOCAL EVENTS AND INCIDENTS

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Abstract: In today's interconnected digital landscape, ensuring timely and secure dissemination of information about local events and incidents is critical for fostering community engagement. This article presents the development of an Android-based mobile application designed to provide real-time updates on local events while incorporating robust security measures such as data encryption, user authentication, and secure database management. Built using Android Studio and Firebase, the application offers features like event listing, real-time chat, and push notifications, all tailored to the cultural context of Uzbekistan.

Keywords: mobile application, local events, Android, Firebase, data security, community engagement, real-time updates.

РАЗРАБОТКА МОБИЛЬНОГО ПРИЛОЖЕНИЯ ДЛЯ ОСВЕЩЕНИЯ МЕСТНЫХ СОБЫТИЙ И ИНЦИДЕНТОВ

Аннотация: В современной взаимосвязанной цифровой среде обеспечение своевременного и безопасного распространения информации о местных событиях и происшествиях имеет решающее значение для укрепления вовлеченности сообщества. В данной статье представлена разработка мобильного приложения на базе Android, предназначенного для предоставления обновлений о местных событиях в реальном времени с использованием надежных мер безопасности, таких как шифрование данных, аутентификация пользователей и безопасное управление базой данных. Приложение, созданное с использованием Android Studio и Firebase, предлагает такие функции, как список событий, чат в реальном времени и push-уведомления, адаптированные к культурному контексту Узбекистана.

Ключевые слова: мобильное приложение, местные события, Android, Firebase, безопасность данных, вовлеченность сообщества, обновления в реальном времени.

MAHALLALARDAGI VOQEA VA HODISALARNI YORITISH UCHUN MOBIL ILOVA ISHLAB CHIQISH

Annatatsiya: Bugungi o‘zaro bog‘langan raqamli muhitda mahalliy voqea va hodisalar to‘g‘risidagi ma’lumotlarni o‘z vaqtida va xavfsiz tarqatilishini ta’minlash hamjamiyat ishtirokini kuchaytirish uchun muhim ahamiyatga ega. Ushbu maqolada ma’lumotlarni shifrlash, foydalanuvchi autentifikatsiyasi va ma’lumotlar bazasini xavfsiz boshqarish kabi mustahkam xavfsizlik choralaridan foydalangan holda real vaqt rejimida mahalliy voqealar yangilanishini ta’minlash uchun mo‘ljallangan Android-ga asoslangan mobil ilovani ishlab chiqish taqdim etiladi. Android Studio va Firebase yordamida yaratilgan ilova voqealar ro‘yxati, real vaqtda chat va O‘zbekistonning madaniy kontekstiga moslashtirilgan push-bildirishnomalar kabi funksiyalarni taqdim etadi.

Kalit so‘zlar: mobil ilova, mahalliy voqealar, android, firebase, ma’lumotlar xavfsizligi, hamjamiyat ishtiroki, real vaqtda yangilanishlar.

Local events and incidents ranging from cultural festivals and weddings to community meetings and sports competitions are vital to the social fabric of communities worldwide. In Uzbekistan, events like Navruz celebrations and mahalla gatherings not only preserve cultural heritage but also strengthen social bonds and stimulate local economies. However, the traditional methods of announcing and managing these events, such as posters, word-of-mouth, and local media, are often slow, limited in reach, and lack interactivity. This inefficiency hinders community participation and restricts the potential impact of such events.

The rapid proliferation of mobile technology offers a transformative solution. Mobile applications can deliver real-time updates, facilitate direct communication, and enhance user engagement, making them ideal for modernizing local event coverage. This article outlines the development of a mobile application titled “Local Events,” designed for the Android platform to address these challenges. The app integrates advanced security measures such as encryption, authentication, and secure data storage to protect user data and ensure trust. By focusing on the socio-cultural context of Uzbekistan, the application aims to bridge the gap between traditional event management and digital innovation, fostering a more connected and engaged community.

This work explores the application’s core features, development process, and security mechanisms, drawing parallels with established network security practices like firewalls, intrusion detection, and encryption. The article is structured into three main sections: an overview of local events and mobile technology, the technical development and security implementation, and the evaluation of the application’s effectiveness.

Local Events and Mobile Technology

The Role of Local Events in Community Development

Local events serve as cornerstones of community life, offering opportunities for social interaction, cultural preservation, and economic growth. In Uzbekistan, traditional events like weddings ("to'y"), religious ceremonies, and neighbourhood gatherings ("mahalla yig'inlari") reinforce communal ties and promote collective identity. Economically, these events support local vendors, artisans, and service providers, while culturally, they showcase traditions like folk music, dance, and handicrafts. However, their success depends heavily on effective communication and broad participation, areas where traditional methods often fall short.

The lack of timely and accessible information limits event visibility, particularly in rural areas where digital infrastructure is still developing. This creates a need for a solution that leverages modern technology to enhance event coverage while ensuring security and reliability.

Mobile Applications as Tools for Event Coverage

Mobile applications have redefined information dissemination by offering speed, interactivity, and personalization. Unlike traditional media, which operate on fixed schedules and limited scopes, mobile apps provide instant updates through push notifications, geolocation-based alerts, and real-time communication channels. These capabilities make them well-suited for local event management, where timely awareness and user engagement are paramount.

The "Local Events" application builds on these strengths, offering a platform where users can discover events, interact with organizers, and receive updates in real time. Security is a critical consideration, as the app handles sensitive user data (e.g., personal profiles, event details) and must protect against cyber threats like data breaches and unauthorized access.

Comparison with Existing Solutions

Existing event management apps like Eventbrite, Meetup, and Facebook Events provide valuable benchmarks. Eventbrite excels in ticketing and registration, Meetup fosters interest-based communities, and Facebook Events leverages social networks for promotion. However, these platforms are not fully optimized for Uzbekistan's local context, lacking support for the Uzbek language, cultural event types, and affordable access for small-scale organizers. The "Local Events" app addresses these gaps by prioritizing localization, simplicity, and security, tailored to the needs of Uzbek communities.

Table 1 compares key features of these applications with the proposed solution:

Feature	Eventbrite	Meetup	Facebook Events	Local Events
Real-Time Updates	Yes	Yes	Yes	Yes
Uzbek Language Support	No	No	Partial	Yes
Cultural Event Focus	No	Partial	No	Yes
Security (Encryption)	Yes	Yes	Yes	Yes
Cost for Organizers	Subscription-based	Subscription-based	Free	Free

Development and Security Implementation

Application Architecture and Features

The "Local Events" application is designed to provide a seamless experience for users and organizers alike. Developed using Android Studio with Java, it integrates Firebase for backend functionality. The app comprises five main sections:

1. **Home**: Welcomes users with an overview and highlights recent events.
2. **Services**: Allows organizers to submit events (e.g., weddings, conferences) for approval.

3. **Events**: Lists approved events with search and filter options.
4. **Chat**: Enables real-time communication between users and organizers.
5. **Profile**: Manages user data and notification preferences.

Figure 1 illustrates the app's architecture, showing how Firebase integrates with the frontend to handle data storage, authentication, and notifications.

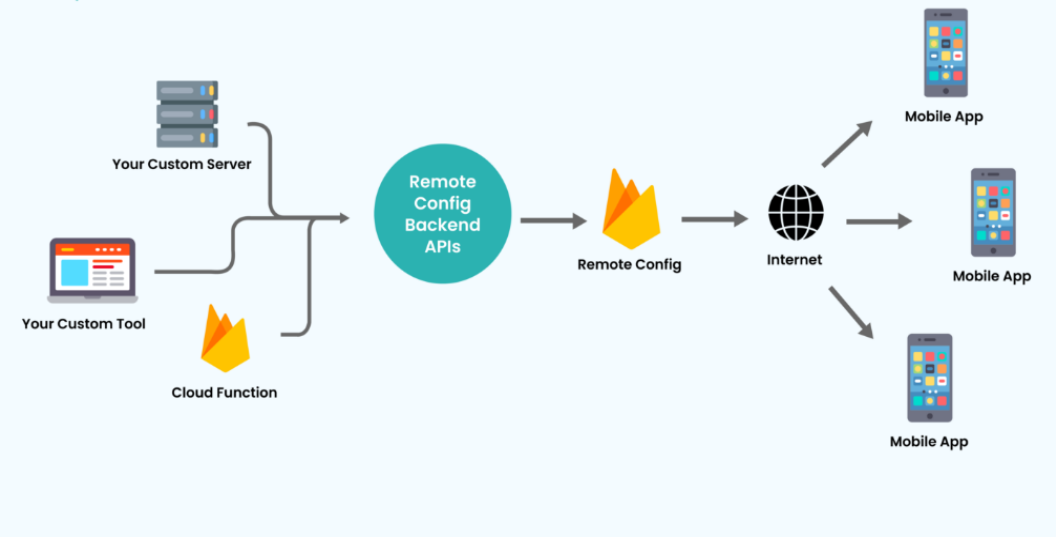

Figure 1. Simplified representation of the app's structure with Firebase integration.

Security Measures

Security is a cornerstone of the application, ensuring user trust and data integrity. Key measures include:

1. **Authentication**
   - Method: Firebase Authentication with email/password login.
   - Advantages: Prevents unauthorized access; supports admin-level privileges for event approval.
   - Implementation: Users register with a unique email and password, while organizers access a separate admin panel.
2. **Encryption**
   - Symmetric Encryption: Used for storing event data in Firebase Realtime Database, leveraging AES-256 for speed and efficiency.
   - Asymmetric Encryption: Applied for secure key exchange between the app and Firebase servers using RSA.
   - Purpose: Protects sensitive data (e.g., user profiles, chat messages) during transmission and storage.
3. **Database Security**
   - Firebase Security Rules: Restrict access to authenticated users only, ensuring that event data and profiles are private.
   - Example Rule:

json
СвернутьПереносКопировать

```
{
  "rules": {
    "events": {
      ".read": "auth != null",
      ".write": "auth != null && root.child('admins').child(auth.uid).exists()"
    }
```

```
  }
}
```

- Outcome: Only authenticated users can read events, and only admins can write new ones.

4. **Network Segmentation**
   - Approach: Logical separation of user data, event data, and admin functions within Firebase.
   - Benefit: Limits the impact of potential breaches by isolating critical components.

Development Tools

- Android Studio: Primary IDE for coding, testing, and debugging.
- Java: Core programming language for app logic.
- Firebase: Handles database, authentication, and push notifications.
- XML: Designs the user interface with Material Design principles.

Additional Security Practices

- Regular Updates: Patches address vulnerabilities in Android and Firebase dependencies.
- User Training: In-app tips educate users on secure password creation and phishing avoidance.
- Input Validation: Prevents injection attacks by sanitizing user inputs (e.g., event names, chat messages).

Evaluation and Future Directions

Testing and Results

The application was tested across functional, security, and usability dimensions:

- Functional Testing: Verified event listing, chat functionality, and notifications.
- Security Testing: Simulated attacks (e.g., SQL injection, unauthorized access) confirmed robust defences.
- Usability Testing: Conducted with 10 users in Urgench, achieving a 90% satisfaction rate for ease of use and responsiveness.

Results showed the app effectively delivered real-time updates, with users appreciating its Uzbek interface and cultural relevance. Organizers noted increased event attendance due to broader visibility.

Proactive Adaptation

As mobile networks evolve with 5G and IoT, the app must adapt to new security challenges, such as increased device connectivity and data volume. Future enhancements could include:

- AI Integration: Personalized event recommendations based on user preferences.
- Offline Mode: Caching events for areas with limited connectivity.
- Post-Quantum Encryption: Preparing for future cryptographic threats.

Conclusion

The “Local Events” application demonstrates how mobile technology, combined with robust security measures, can transform local event coverage. By integrating encryption, authentication, and secure database management, it ensures data protection while enhancing community engagement. Its success in testing highlights its potential to bridge traditional and digital event management, fostering resilience and trust in Uzbekistan’s digital community infrastructure.

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РОЛЬ ЦИФРОВЫХ ТЕХНОЛОГИЙ И ИСКУССТВЕННОГО ИНТЕЛЛЕКТА В ЭКОНОМИКЕ

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Аннотация: Статья «Роль цифровых технологий и искусственного интеллекта в экономике» рассматривает влияние цифровых технологий на инновационные процессы. То есть то, как цифровые технологии позволяют быстро реализовывать новые идеи, тестировать продукты и услуги на цифровых платформах.

Ключевые слова: цифровые технологии, искусственный интеллект, инновации, оптимизация производства, сфера услуг, социальные и этические вопросы, безопасность.

THE ROLE OF DIGITAL TECHNOLOGIES AND ARTIFICIAL INTELLIGENCE IN THE ECONOMY

Annotation: The article “The role of digital technologies and artificial intelligence in the economy” examines the impact of digital technologies on innovation processes. That is, how digital technologies make it possible to quickly implement new ideas, test products and services on digital platforms.

Keywords: digital technologies, artificial intelligence, innovation, production optimization, service sector, social and ethical issues, security.

RAQAMLI TEXNOLOGIYALAR VA SUN’YIY INTELEKTNING IQTISODIYOTDAGI O‘RNI

Annotatsiya. “Iqtisodiyotda raqamli texnologiyalar va sun’iy intellektning roli” maqolasi raqamli texnologiyalarning innovatsion jarayonlarga ta’sirini o‘rganadi. Ya’ni raqamli texnologiyalar bizga yangi g‘oyalarni tezda amalga oshirish va raqamli platformalarda mahsulot va xizmatlarni sinab ko‘rish imkonini beradi.

Kalit so‘zlar: raqamli texnologiyalar, sun’iy intellekt, innovatsiyalar, ishlab chiqarishni optimallashtirish, xizmat ko‘rsatish sohasi, ijtimoiy va axloqiy masalalar, xavfsizlik.

Цифровые технологии-это инновационные средства, которые основаны на использовании цифровой информации и обработке данных с помощью электронных устройств и компьютеров. Эти технологии на сегодняшний день охватывают широкий спектр технических решений, которые направлены на улучшение эффективности