**Personal Project Report: Namibia Hockey Union Mobile App Development**  
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**Introduction**

As a student new to mobile app development, this project was my first hands-on experience with Android app creation using Flutter and Kotlin. Initially, I had limited knowledge of these technologies but through this project developing an app for the Namibia Hockey Union ,I gained practical skills in cross-platform development, Firebase integration, and team collaboration.

**Key Learnings**

**1. Flutter & Dart Fundamentals**

* **Widget-Based UI:** Learned how Flutter uses widgets to build interfaces e.g., ListView, Card, TabBar.
* **State Management:** Understood the difference between Stateless and Stateful widgets to manage dynamic data.
* **Firebase Integration:** Successfully connected the app to Firestore for real-time data (teams, players, events) and implemented Firebase Authentication for user roles (admin/manager).

**2. Kotlin for Android**

Though we later switched to pure Flutter, my early exposure to Kotlin taught me.

* How platform channels work to bridge Flutter and native Android code.
* Basic Kotlin syntax for handling biometric authentication .

**3. Debugging & Problem-Solving**

* **Common Errors:** Learned to resolve dependency conflicts in (pubspec.yaml) and null-safety issues in Dart.
* **Testing:** Used the Android Emulator and physical devices to test UI responsiveness and Firebase functionality.

**4. Version Control & Collaboration**

* **Git/GitHub:** Our team used GitHub to merge code, resolve conflicts, and track progress. Initially challenging, but now I understand branching and pull requests.
* **Task Allocation:** Divided work into frontend , backend, and documentation roles.

**Challenges Faced**

1. **Learning Curve:**
   * Struggled with Dart's asynchronous for Firebase operations.
   * Initially confused about widget lifecycle management.
2. **Team Coordination:**
   * Merging code from different team members led to conflicts e.g., duplicate variable names.
   * Scheduling meetings was tough due to varying availability.

**How Challenges Were Overcome**

1. **Peer Learning:**
   * Teammates experienced with Flutter helped debug UI issues.
   * Pair-programmed to implement complex features like the role-based dashboard.
2. **Instructor Guidance:**
   * Asked for clarifications on Firestore security rules to protect sensitive data.
3. **Iterative Testing:**
   * Broke down features into smaller tasks e.g., "Implement player list first, then add search functionality".

**Teamwork Experience**

* **Strengths:**
  + Balanced skill sets some members focused on UI, others on logic.
  + Regular stand-up meetings kept everyone accountable.
* **Areas for Improvement:**
  + Should have used project management tools (Trello/Asana) earlier to track tasks.
  + Needed clearer documentation for shared components (e.g., how the TeamsTab expected data from Firestore).

**Conclusion**

This project transformed my understanding of mobile development from theory to practice. Key takeaways:

1. Flutter’s "write once, run anywhere" approach is powerful but requires careful design.
2. Teamwork is essential communication and clear role division make or break a project.
3. Debugging is a skill as important as coding.

I now feel confident to build basic apps and collaborate on larger projects. For future work, I’d like to explore advanced state management (Riverpod/Bloc) and CI/CD pipelines for app deployment.