A Governance Framework for Native Module Development in Enterprise React Native Applications

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Abstract:

Banks, wealth managers and payment providers now deliver much of their customer-facing service through cross-platform mobile applications built with React Native. As these applications mature, engineering teams repeatedly face the same decision: should a feature be built as a native module in Kotlin or Swift, or stay in the shared JavaScript layer? In most organisations this decision is made inconsistently, often based on individual habit or delivery pressure. The result is duplicated code, concentrated specialist knowledge, rising maintenance costs and, in regulated financial services, avoidable security and compliance exposure.

This paper proposes a practical governance framework for making that decision consistently. It defines four criteria: performance sensitivity, security and compliance requirements, platform capability access, and long-term maintainability. These are combined into a simple 0–12 scoring model that teams can apply within an existing architecture review. A security override recognises that capabilities such as biometric payment approval and secure-enclave key storage generally justify native implementation on their own. The paper also presents a three-layer reference architecture, a lightweight module register and a standing review and deprecation process. Three illustrations drawn from wealth management and financial services, namely biometric payment approval, a design token system and portfolio chart rendering, show the model applied in full.

The paper is a practitioner contribution based on more than fifteen years of experience in banking and fintech mobile delivery, and its evidence is experiential rather than empirical. It states its limitations openly, including scoring subjectivity and the potential misuse of the security override.

Keywords:

Digital banking, FinTech, mobile application governance, React Native, native modules, security and compliance, software architecture.