**Introduction**

In today’s banking world, personalization isn’t just a buzzword, it’s the ticket to real customer engagement and solid business growth. Banks like FNB are all-in on machine learning, aiming to make their services smarter and more relevant. Recommender systems are at the heart of this shift. These tools sift through customer data to predict and suggest products that actually fit each person’s needs and habits. It’s about smarter offers, happier customers, and, not to sugarcoat it, better business results.

This report zeroes in on building a recommendation system tailored for FNB. We cover the full process: data wrangling, feature selection, model training, and a deep dive into performance. It's not just about getting the correct solution but also whether it delivers real value. We also examine practical deployment issues: can the system scale up, is it compliant with regulations, and does it deliver a smooth user experience? All things considered, the goal is a solution that’s ready for real-world action.

Of course, there are limits. The available data set isn’t perfect, there’s no live user interaction to learn from, and this system isn’t plugged into FNB’s actual operations yet. Even so, the findings here offer a solid foundation for any financial institution looking to up their digital game and keep pace with fast-changing customer expectations. In short: innovate or risk falling behind.

**Improvement on User Engagement**

Bringing a recommender system into FNB’s digital platforms isn’t just a tech upgrade, it's a strategic move that could seriously boost customer engagement. Instead of the usual random approach, customers would see offers and services actually tailored to how they bank, what they spend on, and what they need next. It’s smarter, more focused, and, honestly, just more helpful. The platform would analyze through transaction history, personal preferences, and then serve up financial products that actually make sense for each user. No more analyzing through irrelevant offers just targeted recommendations that save everyone time and drive real value.

Plus, as customers interact more (and the system keeps learning), recommendations get sharper and more on-point. That not only makes the experience smoother but also strengthens the relationship between customers and the bank. Over time, this sort of personalization can keep people coming back, boosting loyalty and repeat business. It’s a win-win customers feel understood, and FNB gets more meaningful engagement.