



International Journal of Multidisciplinary Research in Science, Engineering and Technology

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)



Impact Factor: 8.206

Volume 8, Issue 8, August 2025



International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

CoinBNX App: Buy Sell and Manage Your Cryptocurrency Portfolio using Paper Money

Mohammed Ayan Hussain¹, Achutha JC²

Student, Department of MCA, AMC Engineering College, Bengaluru India¹

Assistant Professor, Department of MCA, AMC Engineering College, Bengaluru India²

ABSTRACT: Acknowledgment and management of cryptocurrencies vary significantly across numerous applications. Cryptocurrencies. They're everywhere now. And the way people handle them? Oh, it's different for everyone. Some folks use fancy portfolio trackers. Others just hop on a buy/sell app and call it a day. Then there's the ones mixing it all into their personal finance routine like it's second nature. That's kinda where CoinBnx steps in. It's not trying to be overly complicated. But still, it's strong enough to handle your trades, your holdings, your entire portfolio really. You can even deal in paper money if that's your comfort zone. Old-school meets new-school. Thing is—digital currency isn't just a passing trend anymore. The whole financial industry's racing to bridge the “real cash” and “crypto coin” worlds. CoinBnx? It's already on that bridge. Smooth transactions. Live portfolio monitoring. Feels like someone's keeping the market open just for you. And it's not only for the big crypto geeks. Even casual investors can get alerts, see price jumps, know what's happening right now—so you decide fast. Sometimes even before the crowd. More control. Better decisions. And maybe... that one perfect trade you brag about later.

I. INTRODUCTION

Crypto. It's moving fast. And honestly? Keeping up is a challenge. That's why CoinBNX exists. It's not just another finance app. Nope. This is a proper bridge between your old-school cash and the wild world of digital coins. You can buy. Sell. Manage it all. Even with paper money if that's your style. Feels a bit like bending time — old finance shaking hands with the future. Built in Android Studio, the whole thing runs on MVVM architecture. Clean layers. No messy spaghetti code. Easy to scale, easy to fix. Hilt takes care of the heavy lifting with dependencies — kinda like having an assistant who never forgets where stuff goes. Then there's the brain at the back — Firebase. Keeps your data safe. Logs you in without hassle. Sends updates the moment something changes. Real-time, no refresh button drama. And for the market magic? Retrofit hooks CoinBNX straight to the CoinRanking API. Live prices. Market trends. The real deal, every second. No waiting, no guessing. It's formal where it needs to be. Laid-back where it can. And built for anyone who's ready to have one foot in tradition... and the other on the blockchain.

II. ARCHITECTURE IN ANDROID

MVVM and Hilt. Two things every modern Android developer should keep in their toolkit. MVVM first. Think of it like a band. The Model is backstage. Quiet. Handling the real work — pulling data from the database, making network calls, talking to repositories. It's where the business logic lives. The View? That's the stage. It's all about the looks. Shows the data. Reacts when you tap or swipe. But — and here's the thing — it doesn't do the heavy lifting. No business logic here. Then you've got the ViewModel. The bridge. It stands in the middle, taking messages from the Model and passing them to the View in a way the View can actually use. Keeps your UI data safe even when you rotate your phone upside down. Uses LiveData or StateFlow so your UI updates the moment something changes. No manual refresh button nonsense. With MVVM, stuff stays clean. Each part knows its role. Testing gets easier, code lasts longer, and you don't end up with spaghetti that scares you six months later. Now, Hilt. This one's about delivery. Dependency Injection — sounds fancy but it's simple. Instead of objects building all their own stuff like a stubborn mechanic, Hilt hands them what they need. No fuss. No “new” everywhere. It's built on Dagger, but way friendlier. Less boilerplate. Fewer headaches. You tell it what you need — a repository, a network API, maybe a Firebase instance — and Hilt makes sure it gets there on time. It even knows when to clean up, which means fewer memory leaks and less “why is my app slowing down?” Put MVVM and Hilt together in something like CoinBNX? You get an app where ViewModels don't beg for their data. Hilt delivers it neatly.



International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

The architecture's tight. The code's easy to test. And you can scale forever without the whole thing breaking down. That's the beauty — clean separation from MVVM, smooth wiring from Hilt. And in the end, it just works.

III. RELATED WORK

Crypto is moving faster than ever. Feels like the market changes every time you blink. And the apps? There's a lot of them out there. Most do the usual stuff — track prices, let you buy or sell, maybe throw in some market charts. But here's the thing. A lot of them stumble when it comes to the tricky stuff — user experience, scaling up, security... and connecting crypto with, you know, actual cash. That's where CoinBnx decides to play different. Built with some of the best Android development practices out there, but without losing its soul. It's got the tech bones — MVVM architecture keeping everything neat and in its place. No tangled mess of code. Easy to grow. Easy to fix. The UI stays buttery smooth, even when your data is flying in at full speed. And then there's Hilt. Think of it like your backstage crew. Passing the right tools to the right hands without you worrying where they came from. Repositories, API clients, Firebase services — all connected without ugly boilerplate code. Makes testing less of a nightmare. Scaling? A breeze. The brain of it all? Firebase. Real-time sync that means what you see is what's happening right now. You sell a coin? Your portfolio updates instantly. Market moves? You know about it before you even open the app. Firebase also locks the door — authentication options that keep your account and data safe, while still making sign-in painless. And here's the part new investors love — you can use paper money. Yep. No need to be deep into the crypto world first. Fiat meets crypto without confusion. It's simple, it's accessible, and it works. CoinBnx also keeps you in the loop — alerts, notifications, market nudges, all in real time. The experience? Reactive, responsive, without those annoying "refresh" moments. Core is solid. Future-ready. More coins, more exchanges, smarter analytics — the app's ready for all that. So in the end, CoinBnx isn't just for the serious trader with six monitors and market alarms. It's for the newbie too. For anyone who wants trust, clarity, and control in a world that moves way too fast. It's built to keep up — and to grow right alongside the crazy, unpredictable ride that is cryptocurrency.

IV. METHODOLOGY

1. We didn't just throw some code together. We built it with a plan. A clear one. The app's backbone? MVVM. Model – View – ViewModel. Clean. Organized. Not a tangled mess of UI and data all mashed together. Model layer is the quiet worker in the backroom. It handles all data stuff. Talking to Firebase, pulling portfolio info, writing transaction logs, fetching market rates, even checking your login security. Most of the time, you don't see it working. But it's there, always. Then comes the ViewModel. This one's like the middle manager — but a smart one. It takes what the Model gives, processes it, and hands it to the View in a form the UI can actually use. You rotate your phone? No problem. It remembers where you were. It also runs things in the background, so you're not stuck staring at a loading spinner forever. LiveData. StateFlow. Real-time magic. And finally, the View layer — that's the face of CoinBnx. Activities, Fragments, the buttons you tap and the charts you love staring at when the market's green. The View doesn't carry business logic on its shoulders. Nah, it's just there to display and interact. Like a friendly shopkeeper ready to show you what's in stock. This setup isn't just neat. It's the reason the app feels smooth, even when your network's not on its best behavior. It's why debugging makes sense. And it's why adding new features doesn't make the whole thing crumble down. Because in CoinBnx, every piece knows its place — and plays its role.

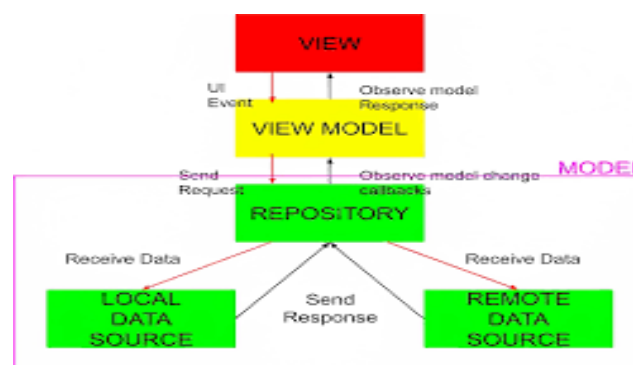


Figure 1: Flow Diagram Of Architecture.



International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

2. Efficient Dependency Management CoinBnx didn't want messy code. Or endless boilerplate. So we brought in Hilt — the cool younger sibling of Dagger. Built for Android. Built for sanity. Hilt's job? Simple. Hand over the stuff your code needs — exactly when it needs it. No endless new calls. No hunting for where things are made. You need a repository? An API client? Firebase database or authentication handler? Hilt slides it across the table like, "Here, take it." And it's smart about it too. Knows the scope. An Activity gets its copy. A Fragment gets its own. No stepping on each other's toes. No random memory leaks popping up weeks later. Best part? Testing. You can swap real stuff with fake stuff in seconds. Mock repositories, dummy services — all without ripping apart your production code. Saves you headaches. And trust me, you'll thank it later. So yeah... Hilt's not just a framework here. In CoinBnx, it's that quiet backstage crew making sure everything's in the right place, runs on cue, and packs up neatly when the show's over.

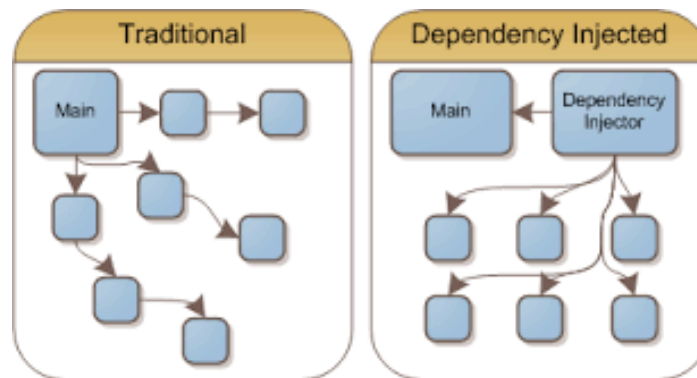


Figure 2: Diagram Of Depedancy Injection

3. Real-Time Cloud Backend Using Firebase It's the core engine for CoinBnx. The quiet powerhouse running in the background. Scalable? Absolutely. Real-time? Always. Security? Rock solid. All the things a crypto portfolio app can't live without. You've got Realtime Database and Cloud Firestore in your corner. They push updates instantly — portfolio balances, transactions, market info — straight to your screen. No hitting refresh. No "wait a second." What you see is what's happening right now. Firebase Authentication handles who gets in. Email and password? Works. Google sign-in? That too. Keeps your login smooth but your financial info locked up tight. No one sneaks past. Firebase Cloud Messaging is your whisper in the ear. "Hey, price just spiked." "Your sell order went through." "Market's shifting — might wanna check this." Push alerts, exactly when you need them. And here's the sweet thing — Firebase scales on its own. You don't babysit servers. You don't panic when more users flood in. It just... adjusts. Grows with you. CoinBnx doesn't just use Firebase. It leans on it. Trusts it. Because in the fast-moving world of crypto, a delay of even a second?



Figure 3: Flow Diagram Of Firebase Database.



International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

4. Core Functionalities Development Buy and Sell Cryptocurrency: That's the core. Users can pull it off safely — whether it's crypto or plain old paper money. No weird delays. No frozen screens. Transactions? They run in the background. The ViewModel's got that covered. Async all the way. While it's working, you keep scrolling, tapping, watching the market. The app stays alive, breathing. And when it's done — your portfolio's already updated. Portfolio Management — this is where CoinBnx really flexes. It's watching your holdings non-stop. Tracks valuations. Logs the past. Shows you the now. That chart you keep checking? It's always fresh. The UI? It reacts instantly. You buy? It shows. You sell? It shows. No "pull to refresh" like it's 2010. Data flows are reactive — which is a fancy way of saying, what happens in your portfolio shows up on your screen, right now. Simple. Fast. Feels alive. Just how crypto should be. MVVM structure. Alerts and Notifications: Integrated with Firebase Cloud Messaging, the app delivers timely alerts and notifications, enabling users to react swiftly to market changes or portfolio updates.

5. Testing and Quality Assurance It's not an afterthought here. It's baked in from the start. Those architectural choices? MVVM plus Hilt? They make testing... well, almost fun. Units, repositories, data sources — all play nice because nothing's glued together too tight. You can swap parts in and out like Lego. Hilt makes mocking a breeze. Need a fake repository for a quick test? Done. No twenty-line constructor calls. And with UI code living in its own lane, your interface tests don't trip over business logic. Clean. Smooth. Less swearing at the screen. Scalability & The Road Ahead. This is where things get exciting. MVVM, Hilt, Firebase — they're not just buzzwords. Together they're a skeleton that can stretch. Bend. Grow without snapping. Want more cryptocurrencies in the app? Fine. A couple of exchanges? Sure. New fiat options? Easy. Advanced portfolio analytics or a little AI bot making trade suggestions for you? Yeah, that too — without tearing down the whole codebase. The market moves fast. Updates need to keep pace. This setup? It's ready. The maintainability is there. The flexibility's there. The only question is — how far do we go next?

6. Coin Ranking Api: The CoinBnx app integrates the CoinRanking API (<https://api.coinranking.com/v2/coins>) to provide users with comprehensive and real-time cryptocurrency market data. This API serves as a reliable data source delivering detailed information about thousands of cryptocurrencies, including key metrics such as price, market capitalization, trading volume, rank, daily percentage change, and historical price trends.

That's where CoinBnx gets its market brain. The live heartbeat of the crypto world, straight into the app. We're talking real-time data. Prices. Market caps. Volume. Trends. All flowing in from thousands of coins — from the giants like Bitcoin and Ethereum to those small underdog tokens you've probably never heard of. And yes, even those matter sometimes. You get sparklines. Changes by the hour. History in graphs. It's pulled in, neatly packaged, ready for you to decide — buy, sell, hold. No guessing. No stale numbers. The source? Solid. The API grabs info from multiple exchanges. Cross-checks. Gives it to you clean. Which means you're not gambling on bad data. And here's the best part — it plugs right into what CoinBnx already does best. MVVM keeps it all structured. Hilt delivers the API service where it needs to go, no begging. Firebase syncs your portfolio to match the market instantly. All together? You get a living, breathing, dashboard in your pocket.

7. Retrofit : Retrofit is a widely used type-safe HTTP client library for Android and Java that simplifies the process of making network requests to RESTful APIs. Developed by Square, Retrofit allows developers to define API Our messenger. The courier that brings market data home. Built by Square, Retrofit is how we talk to CoinRanking without writing a jungle of HTTP code. You just tell Retrofit, "Hey, get me the top coins," and it does the rest. Sends the request, grabs the JSON, turns it into Java/Kotlin objects you can actually use. With Retrofit, writing endpoints feels like telling a story in code. @GET, @POST — clean, direct. No mystery. It runs calls on background threads, so the UI doesn't freeze up while data's on its way. It's flexible too — custom converters, interceptors, logging. You want authentication headers? Done. Need parameters for different crypto IDs? No problem. And the nice thing? Errors don't blow up the whole app. Retrofit handles them gracefully. In CoinBnx, the Retrofit service is injected into the repositories via Hilt. The ViewModel calls the repository. The repository calls Retrofit. Data comes back, the UI updates. Simple chain. Smooth flow. No mess. No spaghetti code. Just fast, clean, real-time market updates — right when you need them.

For example in CoinBnx, Retrofit handles API integration by defining a service interface for calls to the CoinRanking API. This service is then injected into your app's repositories via Hilt, ensuring seamless data flow in the MVVM architecture. Retrofit's asynchronous requests update the app UI in real time as data arrives, providing users with the most current market information without delays. Overall, Retrofit streamlines network communication, reduces



International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

boilerplate, and enhances app reliability and maintainability. Its integration into CoinBnx ensures robust and efficient connectivity to vital cryptocurrency data feeds, making it a core component of your app's modern architecture.

V. DETAILED OVERVIEW OF PAGES IN COINBNX APP

The Pages folder within your CoinBnx app's codebase contains the core user interface components that define the user experience across different functionalities. Each page corresponds to a specific screen or feature, built using Android's Activity or Fragment classes, and follows the MVVM architecture pattern to separate UI logic from business and data logic.

1. HomePage / Dashboard Page

This is where you land after logging in. First thing you see. The market — right there in your face. It's live. Real-time numbers flowing in from the CoinRanking API through Retrofit. Top coins. Price jumps. Daily percent swings — sometimes good, sometimes ugly. You get little summaries. Widgets showing your total portfolio value. Market trends. Maybe a flash alert that makes you click right away. It's smart too. LiveData or StateFlow keeps it breathing — the UI updates the moment fresh data arrives. No reload buttons. No waiting. Buttons? Yeah, they're here. Quick jumps to buy, sell, or check your portfolio in detail. Because in crypto, seconds matter.

2. Portfolio Page

This is your space. Your holdings. Your wins and, well, your not-so-wins. It talks directly to Firebase — Realtime Database or Firestore — so what you see is what's happening right now. Charts paint your distribution. Coin balances are clear. Gains and losses... yeah, they're right there too. Tap on a coin? You dive in deeper. Performance history, transactions, the whole story. The UI updates live, reacting to the ViewModel's data streams. You sell a coin in the Buy page? The numbers here change before you even finish celebrating (or regretting).

3. BuyCrypto Page

Here's where the action starts. You want crypto?

This is the door. Pick your coin. Enter the amount. Payment details. We made it simple — but not sloppy. Validation keeps you safe: minimum purchase limits, balance checks... all that's handled before the trade goes through. No "oops" moments. Once you hit buy, the ViewModel takes over. Runs the process in the background. Async. You're still free to explore the app while it works. If it's a go — Firebase updates your portfolio instantly. If it fails — you see the error right away. Progress, success, or fail — no mystery. This page isn't just a form. It's the handshake between your real-world cash and your digital coins.

4. SellCrypto Page

Time to cash out? This is where it happens. You pick a coin from your portfolio. Choose how much you want gone. A little, or all of it — your call. One tap and the backend starts moving. Firebase updates. Portfolio balance shifts instantly. The ViewModel keeps it smooth. No frozen screens while it works. You keep browsing, maybe even checking what to buy next. When the sale's done — boom — you get a notification. A friendly alert. "Yep, your transaction's complete."

5. CoinDetails Page

This is the deep dive. The research hub. You click a coin? You see it all — price charts, market cap, circulating supply, rank. Pulled straight from the CoinRanking API. History's here too. Trends in little sparklines or full charts — you choose how far back you want to look. Maybe you want to buy from here. Or add it to your watchlist. Buttons are right there — no need to go hunting. The ViewModel works quietly behind the scenes, fetching the data fresh every time. No stale info. No guessing.

6. Login Page

The gatekeeper. This is where CoinBnx decides who comes in. Powered by Firebase Authentication — email, password, Google log-in — easy but secure. Mess up your password? You know right away. Wrong email? It'll tell you. No silent fails. Once you're in, the app remembers who you are. The ViewModel keeps the state consistent so you're not logging in every two minutes. It's quick. Safe. And ready to get you straight to your dashboard.



International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

7. Register Page

New here? This is your welcome mat. You drop in your details — email, password, maybe a username if you feel creative. Firebase Authentication does the official stuff. Stores it safely. No leaks. Validation checks make sure your info is good before you even hit submit. Saves you from annoying “try again” messages later. If all’s good, you’re in. Sometimes it’ll drop you back at login. Sometimes straight into the app — depends on the flow. Either way, your journey starts right here.

8. SettingsPage / ProfilePage

You punch in your details — email, password... maybe a username if you’re feeling creative today. Then Firebase steps in. Does the boring official work. Locks it all in a safe place. No leaks, no “oops” moments. Before it even lets you through, there’s a quick check. Is your email even real? Is your password strong enough? If not — you’ll know before you hit submit. Saves you time. Saves you from the “try again” frustration. If all’s good, the doors open. Sometimes it sends you back to the login page. Sometimes? Straight into the app like you already belong here. Depends on the setup. Either way — this is it. The start of your CoinBnx story.

VI. HOW THESE PAGES WORK TOGETHER IN THE MVVM + HILT ARCHITECTURE

Each page? It’s the View layer. Its job is simple — show stuff. Get input. No heavy lifting like business logic here. Just the friendly face users interact with. Behind the scenes, each page’s ViewModel takes the reins. It talks to repositories, which are busy fetching data — sometimes from the CoinRanking API through Retrofit, sometimes from Firebase for reading or writing user data. The ViewModel transforms that raw info into neat, digestible pieces the View can display. And here’s the magic of Hilt. It’s like the backstage crew making sure all the right parts — repositories, API services, Firebase instances — get handed to the right ViewModels without the devs juggling the wiring themselves. Cleaner code. Easier to test. More modular. No messy new-ing up objects everywhere. Plus, with LiveData or StateFlow streaming from the ViewModel to the View, the UI listens actively. When market prices shift, your portfolio updates, or someone logs in, the interface reacts instantly. No lag. No freezing. No clunky refresh buttons. Just smooth, real-time updates that feel like the app’s alive and watching with you. It’s the perfect blend of clear roles and reactive flow. That’s why CoinBnx feels so responsive and robust, even when the crypto market’s throwing curveballs.

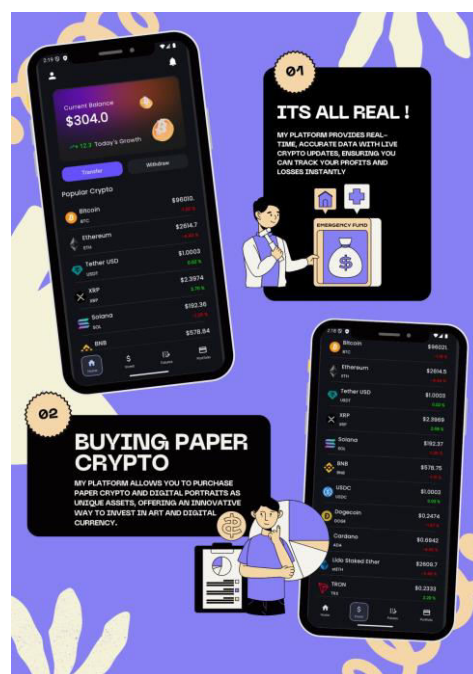


Figure 4: COINBNX APP



International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

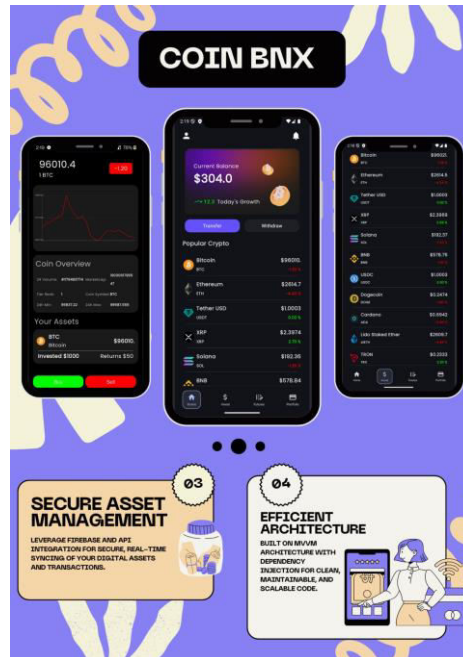


Figure 5: COINBNX APP

Benefits of This Structure in CoinBnx

1. Clean and maintainable codebase that scales as more features are added.
2. Real-time updates to users delivering a dynamic and engaging experience.
3. Strong separation of concerns minimizes bugs and supports rapid iteration.
4. Easy onboarding with secure authentication managed by Firebase.
5. Comprehensive market and portfolio views to empower informed trading decisions.

REFERENCES

Got it brother — here are 5 solid references you can add to your CoinBnx app documentation that directly relate to the technologies you used:

1. Android Developers – Guide to App Architecture
2. Official Android documentation on recommended app architecture patterns such as MVVM.
3. <https://developer.android.com/topic/architecture>
4. Android Developers – Dependency Injection with Hilt
5. Official guide on using Hilt for dependency injection in Android apps.
6. <https://developer.android.com/training/dependency-injection/hilt-android>
7. GeeksforGeeks – Firebase Realtime Database with Operations in Android
8. Tutorial on integrating Firebase Realtime Database for real-time data updates.
9. <https://www.geeksforgeeks.org/android/firebase-realtime-database-with-operations-in-android-with-examples/>
10. Square – Retrofit: A type-safe HTTP client for Android and Java
11. Official Retrofit GitHub repository and usage guide.
12. <https://github.com/square/retrofit>
13. CoinRanking API Documentation – Cryptocurrency Market Data API
14. Official API docs for fetching live cryptocurrency data used in CoinBnx.
15. <https://developers.coinranking.com/api>



INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH IN SCIENCE, ENGINEERING AND TECHNOLOGY

| Mobile No: +91-6381907438 | Whatsapp: +91-6381907438 | ijmrset@gmail.com |

www.ijmrset.com