

# Pankaj Singhal

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## Summary

- **6+ years of experience** in designing and developing **Large Scale Distributed & Concurrent Systems**
- Solid foundation in designing a messaging app with **100M+ users (10M+ DAU & 1B+ messages/day)**
- Solid foundation in designing payments backend with **1M+ transactions/day**

## Experience

### Hike Messenger

Delhi

Sr. Software Developer

May 2014 - Present

- Working in **core backend team** of hike **responsible for entire end-to-end backend of messaging for 100+ million users**. Have headed & **architected several projects from scratch** from the initial days of hike. Have also **scaled & re-architected** several parts of the systems in my tenure to **handle exponential growth** seen by hike both in terms of **messaging and number of users**
- **Lead the Architecture and Implementation** of the following features' **end-to-end backend**
  - **Hike Payments** - **Hike wallet**, integrating merchants like **Hike Recharge, Zomato**, etc, **Blue packets** - a fun way of micro-payments, integrating with **Payment Gateways**, automating **reconciliation & settlement**, security & CS front-end & tooling
  - **File Transfer** - with **pause/resume** via **chunk uploading**. Further improved the user experience by **super fast uploading** of existing content via **MD5**
  - **Secondary Message Store** - Brought this concept for **mass campaigns to optimise storage**. A Redis backed storage layer to deliver campaigns and other low priority messages
  - **DX Framework** - A **zookeeper** based **Rule Engine** for schedule messages/system packets delivery to the user at D0,D1,DX, etc. at runtime. Rules included specifying device details, new user/returning user checks, upgrade, etc. This empowered PMs in **feature rollouts & experiments**
  - **Natasha** - A Bot which provides **services like wiki info, hike caller, weather info, fake call**, etc & to a partner to chit-chat when you're bored.
  - **User Signup & Onboarding** - **OTP & Missed call** based number verification system for user on-boarding
  - **Reward Campaigns** - for user growth which provided **2X increase in DAU**. The campaigns included rewarding both users by inviting someone on hike, or by performing certain actions (like engaging with other users). **Integrated** with 3rd party recharge partners like **PayTM, Oxigen**
  - **Pre-activation Service** - to perform **experiments/monitor & attribute user behaviour before signup**
  - **Multidevice support** - for **Hike Web**
  - **App Migration** - **Secure & Seamless Migration** from old to new Hike app
  - **Message Tracking Framework** - for **message reliability**. Working closely with the Data Analysts & Product managers & continuously monitoring & solving user issues around messaging
- **Live Database Migrations** - Did the following live DB migrations efficiently with data checks and **Zero downtime**
  - **Address Book** - Migrated from **Mysql to HBase** & subsequently from **HBase to Big Table (BT)** along with a redis based cache layer
  - **Timeline's stories** - Migrated from **HBase to BT**
  - **Offline Message Store** - Migrated from **MongoDB to HBase** during live messaging. Users were migrated in batches. This could handle **2X load** of the original cluster
- **Service Integrations**
  - **Push Notification Service (PNS)** - Integrated with **APNS(iOS)/FCM(Android)** for proactively reaching client for message delivery & keeping the **end-to-end messaging latency low**
  - **Cloudinary CDN** - **Improved client latencies** significantly by **serving images and videos through CDN**. Earlier implementation included serving through app servers via S3. Also adapted **network based video quality streaming via CDN** to improve overall user experience
- **Micro-Services Architecture**
  - Lead efforts in moving from **monolith to micro-services** based architecture. **Exposed lot of micro-services** such as block, friends, Send-Mqtt, Prey, Addressbook **on thrift** to align with service oriented architecture across teams. **Converted redundant code to libs** across micro-services.

- Developed a platform which allows the development of custom IVR(Interactive Voice Response) using drag-n-drop. It is also equipped with a scheduler for OBD(Out Bound Calls).

## Skills

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<b>Languages</b>	Java, Python, C, Shell, Android(Basic)
<b>Databases</b>	MySQL, MongoDB, Redis, HBase, Big Table
<b>Frameworks</b>	Spring, Hibernate, Django, Flask
<b>Technologies</b>	Netty, MQTT, HTTP, Zookeeper, WebSocket, Thrift, REST, Kafka
<b>Cloud</b>	Amazon Stack (EC2, S3, SNS, SQS), GCP Stack (Compute Engine, Big Query, GCS), Firebase (FCM)

## Awards

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- Won **Uber hackathon** by integrating their APIs in hike & providing an **MVP of Uber's services within hike**
- Won **Hike hikeathon** by making an MVP of one of the most requested feature - **Number Migration**