



WhatsApp-clone Real-Time & Offline Serverless Messaging Mobile & Web Apps using AWS Amplify & AppSync

HCMC, 06 June 2019
HaNoi, 14 June 2019

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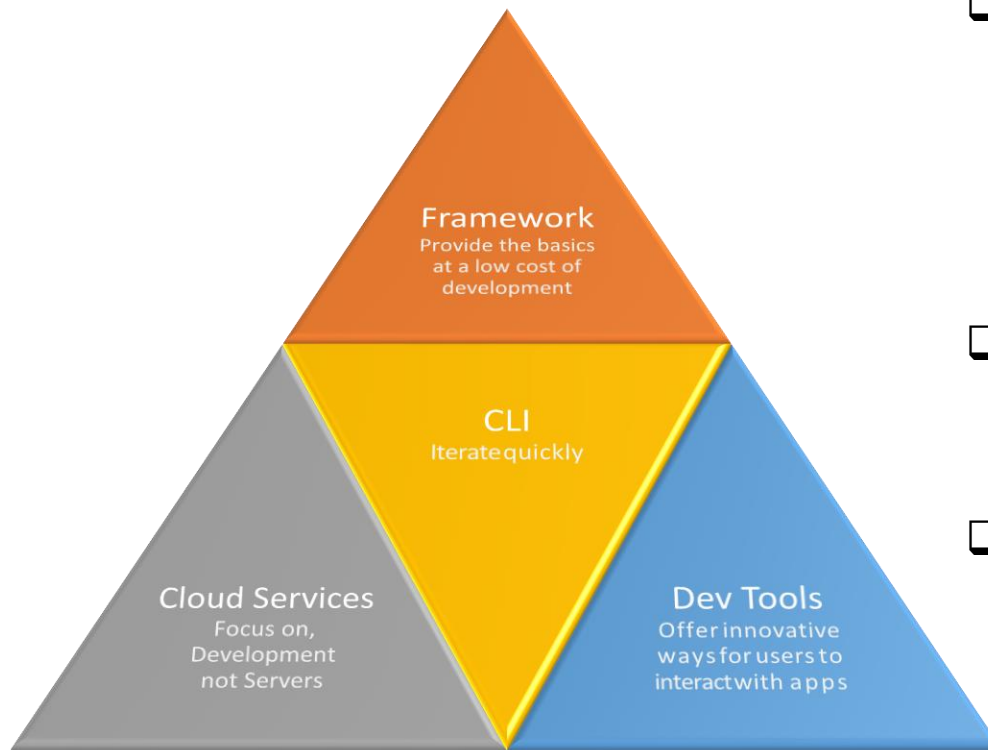
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1.1. The Mobile & Web Apps Challenges



1.2. To solve the Challenges, Developers need to



☐ Cloud Services ... No Servers ~ Serverless

- ❖ **1. Security Challenge:** Amplify & Cognito → AuthN/Z, User Mngt.
- ❖ **2. Right Data Challenge:** AppSync & GraphQL
 - Network friendly (less calls / more data / just right)
 - Instantaneous, with Real-time feedback

☐ CLI & Supported Services

- ❖ Authentication, API, Database, Lambda functions
- ❖ Analytics, Hosting, Storage, Notification, AR/VR

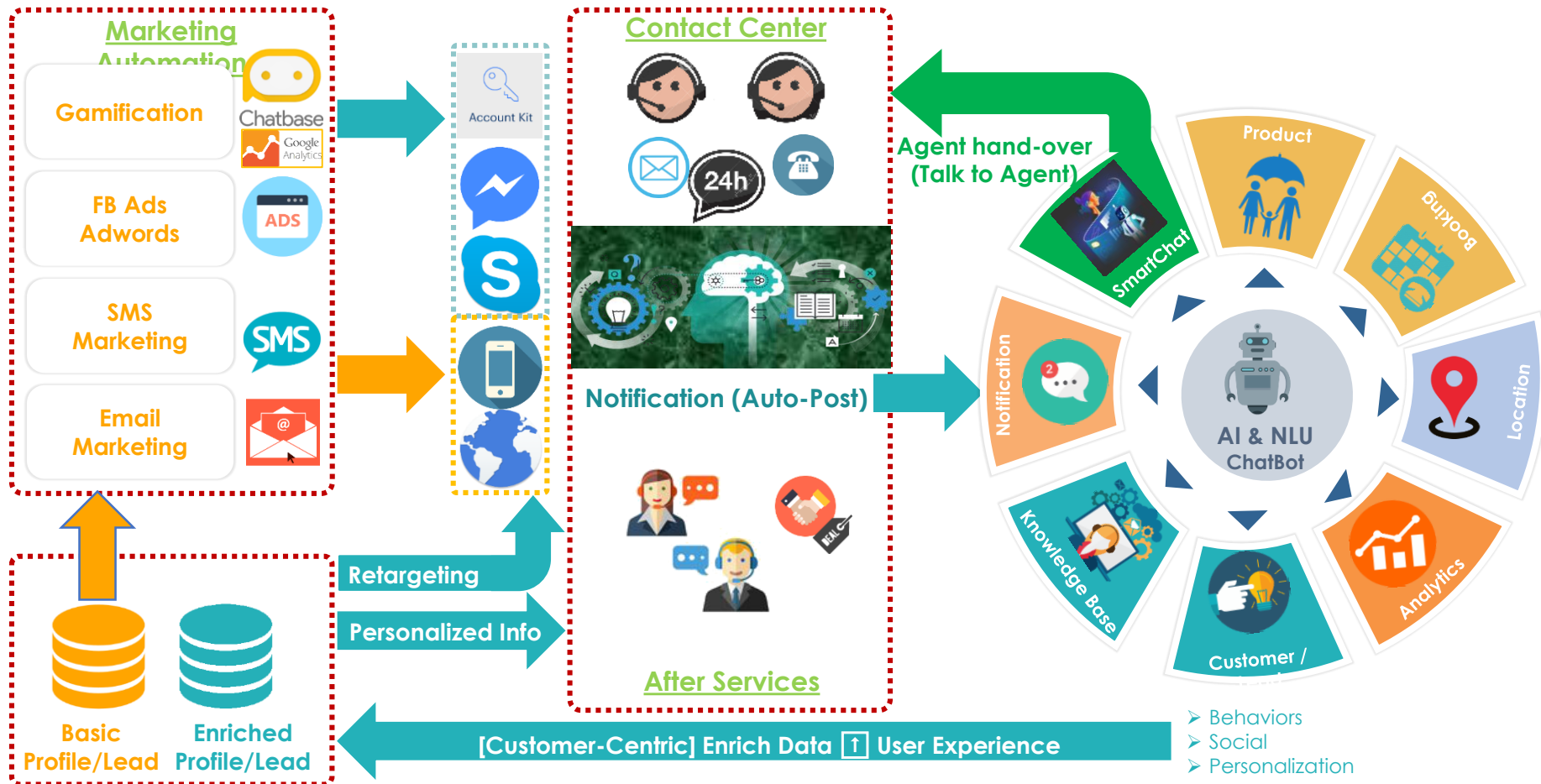
☐ Framework

- ❖ Easily integrate your Backend with iOS, Android, Web, and React-Native Frontends
- ❖ **3. Screen & Mobility Challenge**
AWS AppSync + PWA built-in Offline capabilities

☐ Developer Tools

- ❖ Continuous Delivery and Hosting Service → Amplify Console
- ❖ Full Managed Testing Service for iOS & Android → Device Farm
- ❖ <http://oceansoft.io/blog/aws/2019/06/03/Modern-Mobile-Web-App-using-AWS-Amplify-AppSync.html>

2.1. [Business Needs] Customer Service & SmartChat



2.2. SmartChat WhatsApp-clone - Product Features

Security & User Management: 1

Sign Up, Sign In, Settings

1. **Sign Up:** Email, Google, FB, LinkedIn
2. **Sign In:** Email, Google, FB, LinkedIn
3. **Profile Settings**
4. **User Preferences**
5. **Integrate SmartChat & Chatbot4Website**

2 Small-Talk & FAQ

1. **Text Message**
2. **Emoticon Support**
3. **DnD Question & Answer**
4. **ElasticSearch** a specific Conversation
5. **Omni-Channel:** Auto-Sync Web/Mobile

3 Conversation

New Chat, Group Chat

1. **Chat Listings**
2. **New Chat**
3. **New Group Chat**
4. **Group Detail**
5. **Push Notification & Email Alerts**

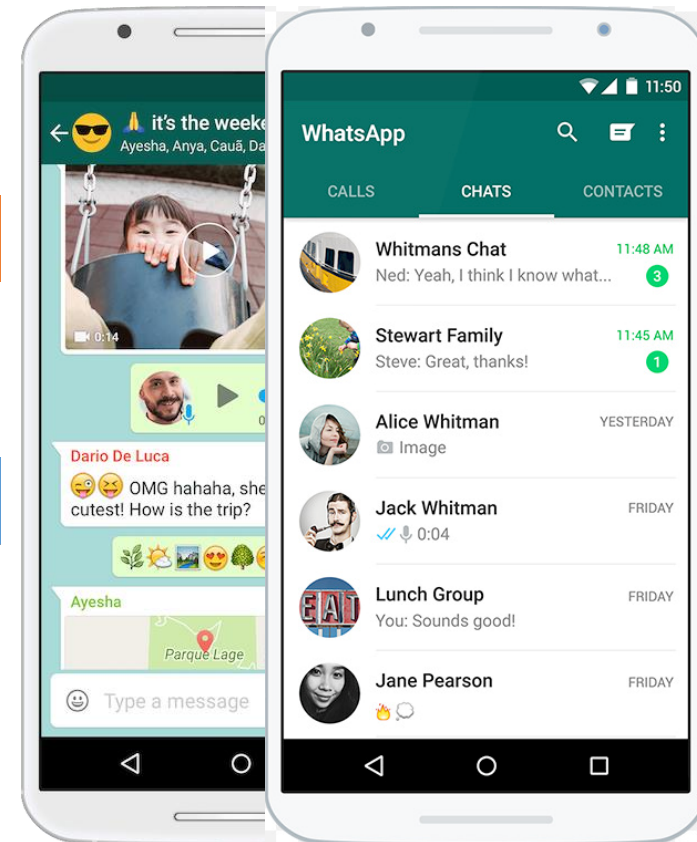
4 Rich Messaging:

Maps, Images, Audio, Video, Files

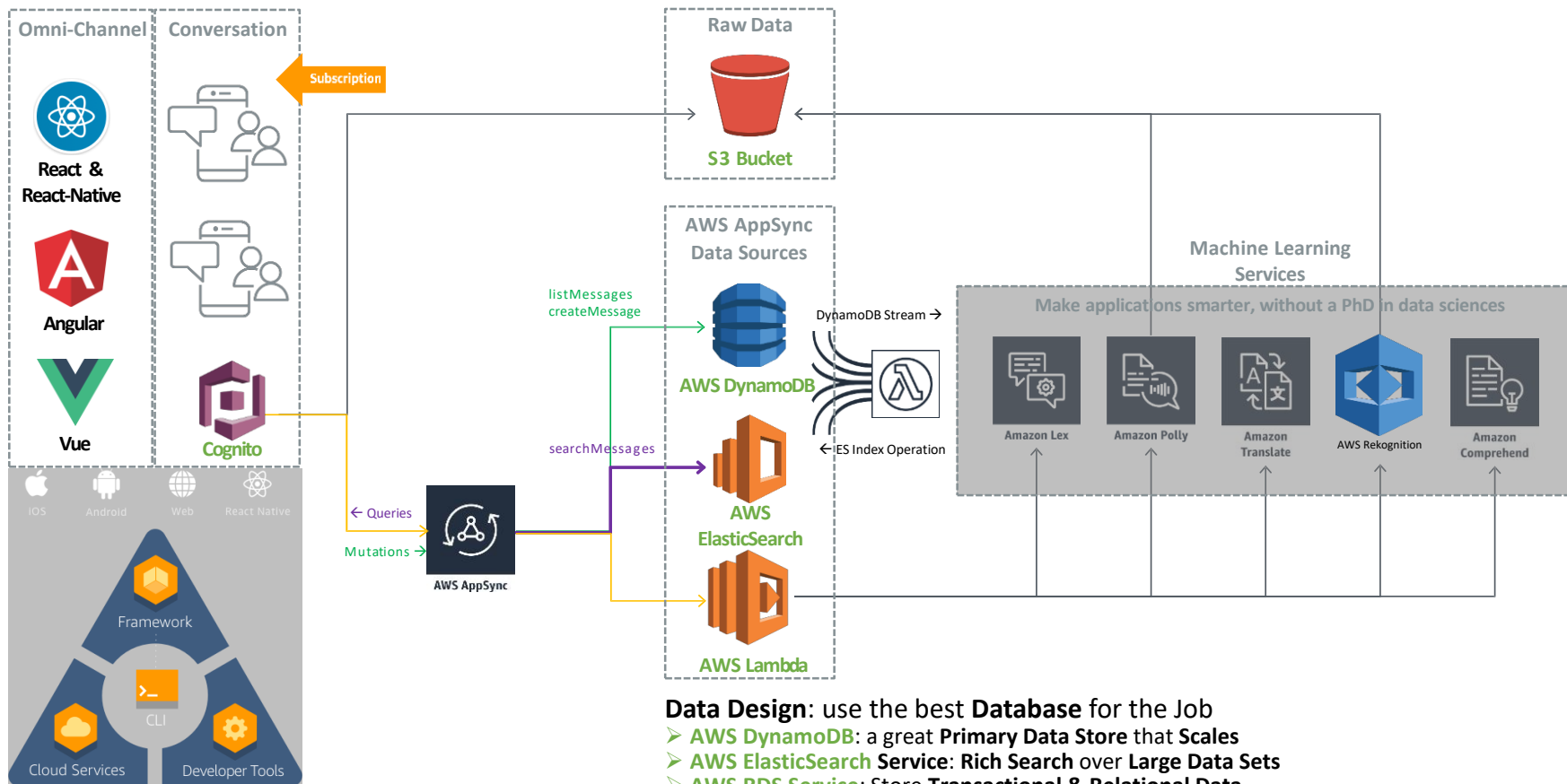
1. **GEO Location / Maps Sharing**
2. **Image Sharing, Gif**
3. **Audio Sharing & Speech to Text**
4. **Video Sharing**
5. **Files & Document Sharing**

5 Business Features

1. **Company/Business Profile** > Be Seen
2. **Quick Replies** > Message+ Work-
3. **Labels** > Stay Organized
4. **Admin Dashboard & BI**
5. **Chatbot for Website**



3. High-Level Architecture & AWS Technology



3.1. [SECURITY] Cognito > Sign-Up/In, Access Control

❑ AWS Amplify CLI Toolchain

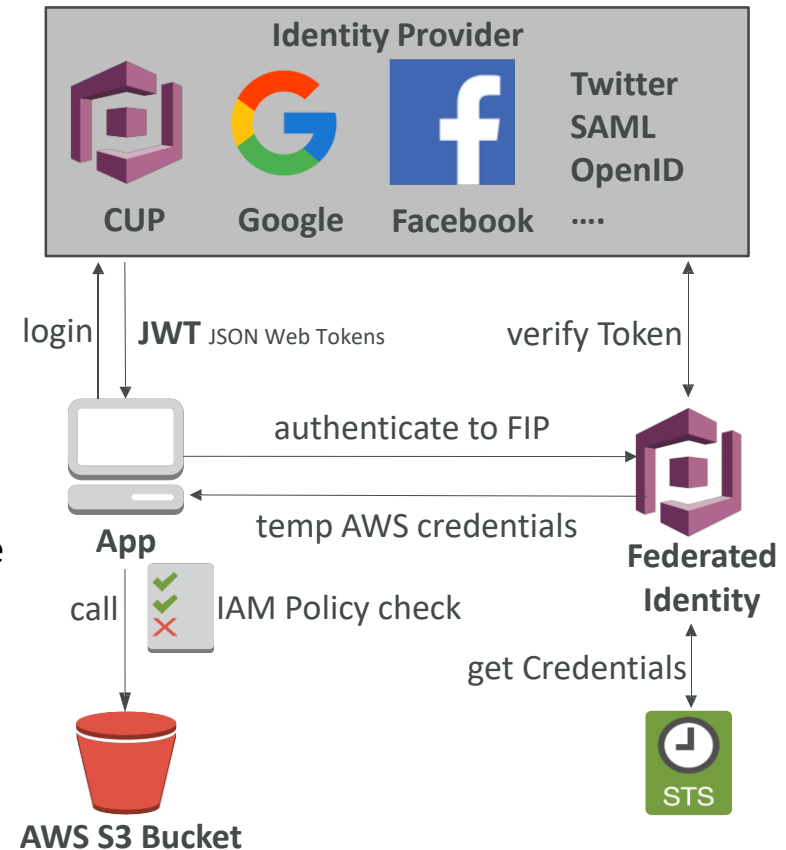
- ❖ Provision **Serverless** Backend resources
- ❖ Use **Auth** module to easily interact
- ❖ Wrap App in Authenticator to require sign-in
- ❖ Uses **Customizable Pre-Built UI Components**

❑ [CUP] Cognito User Pools:

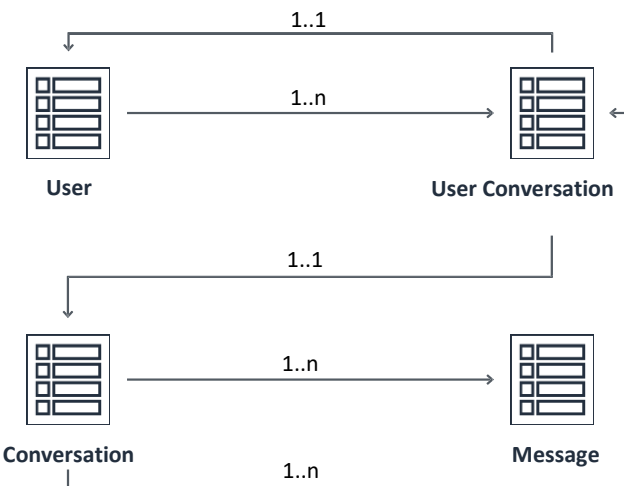
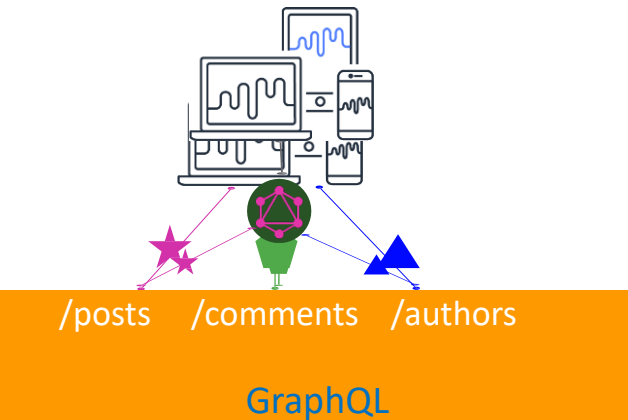
- ❖ Serverless Database of Users for Web & Mobile Apps
- ❖ Simple Login: Username (or Email) / Password combination, verify Emails / Phone-Numbers and add MFA
- ❖ Federated Identities: Facebook, Google, SAML 2.0 ...

❑ [FIP] Cognito Federated Identity Pools

- ❖ Provide direct access to AWS Resources from the Client Side
- ❖ **How:**
 - Log-in to Federated Identity Provider – or remain anonymous
 - Get temporary AWS Credentials back from the Federated Identity Pool
 - Credentials come with a pre-defined IAM Policy stating their Permissions
- ❖ **Example:**
 - Provide (temporary) access to write to S3 Bucket using Facebook Login
- ❖ **Integrate with Cognito User Pools** as an Identity Provider



3.2. [RIGHT DATA] AWS AppSync & GraphQL



❑ **GraphQL** data language
declarative & self-documenting style

- ❖ **Query** - read-only fetch
- ❖ **Mutation** - write, followed by a fetch
- ❖ **Subscription** - long-lived connection for receiving data

❑ Define & deploy **DynamoDB** tables based on **Schema**

- ❖ `@searchable @model @auth @aws_subscribe @connection`
- ❖ mutations queries subscriptions

❑ **DynamoDB** operations map really well to **GraphQL**

- ❖ **Mutation.create/update/delete <Type>**
DynamoDB PutItem/UpdateItem/DeleteItem
- ❖ **Query.get/list<Type>**
DynamoDB Scan or Query

❑ Creates **AppSync API & Resolvers**
AppSync as GraphQL façade

- ❖ **DynamoDB Resolvers**
- ❖ **AWS Lambda Resolvers**
- ❖ **Amazon Elasticsearch Service Resolvers**

3.2. [Screen & Mobility] AppSync + PWA built-in Offline

❑ Network Friendly - Batch Requests

- ❖ Data fetch when component is mounted & **fetchMore**
- ❖ **Cache** lookup for quick User Feedback

❑ Instantaneous - using **Subscriptions**

❑ Responsive from several well-known frameworks available

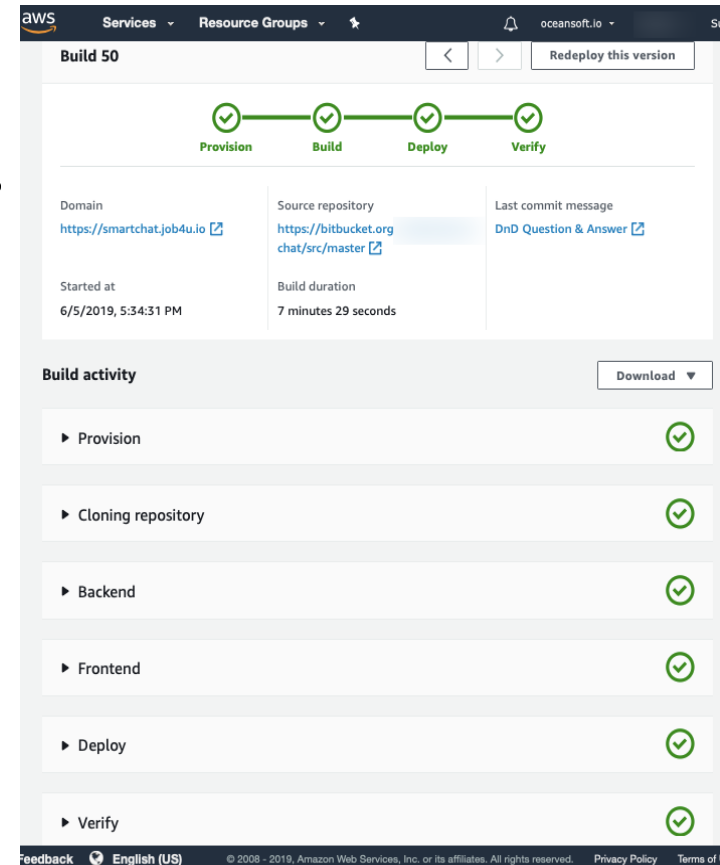
❑ Always Available:

- ❖ Use **Rehydrated** Component to rehydrate **Cache** from **Storage**
- ❖ Use **fetchPolicy** to control usage 'cache-and-network'
- ❖ AWS AppSync SDK: If No Connection, then Store Action; On Reconnection, Send Action

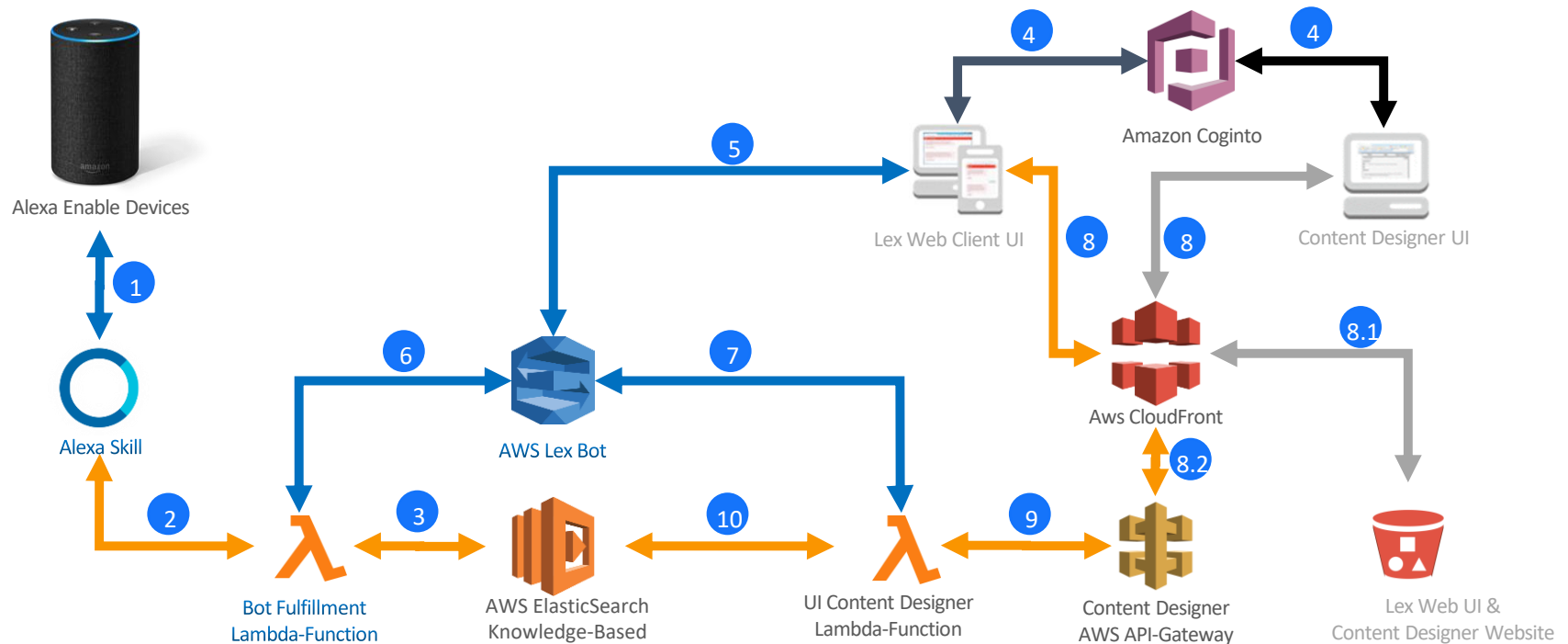
❑ Offline Data Rendering

- ❖ Provide Optimistic Response **optimisticResponse**:
`{ createMessage: {...} }`
- ❖ Useful & required when Offline or slow network
- ❖ Provide all fields present in the returned selection set

⚡ CI/CD using **AWS Amplify Console**



[Reference] FAQ Bot with AWS Lex & Alexa



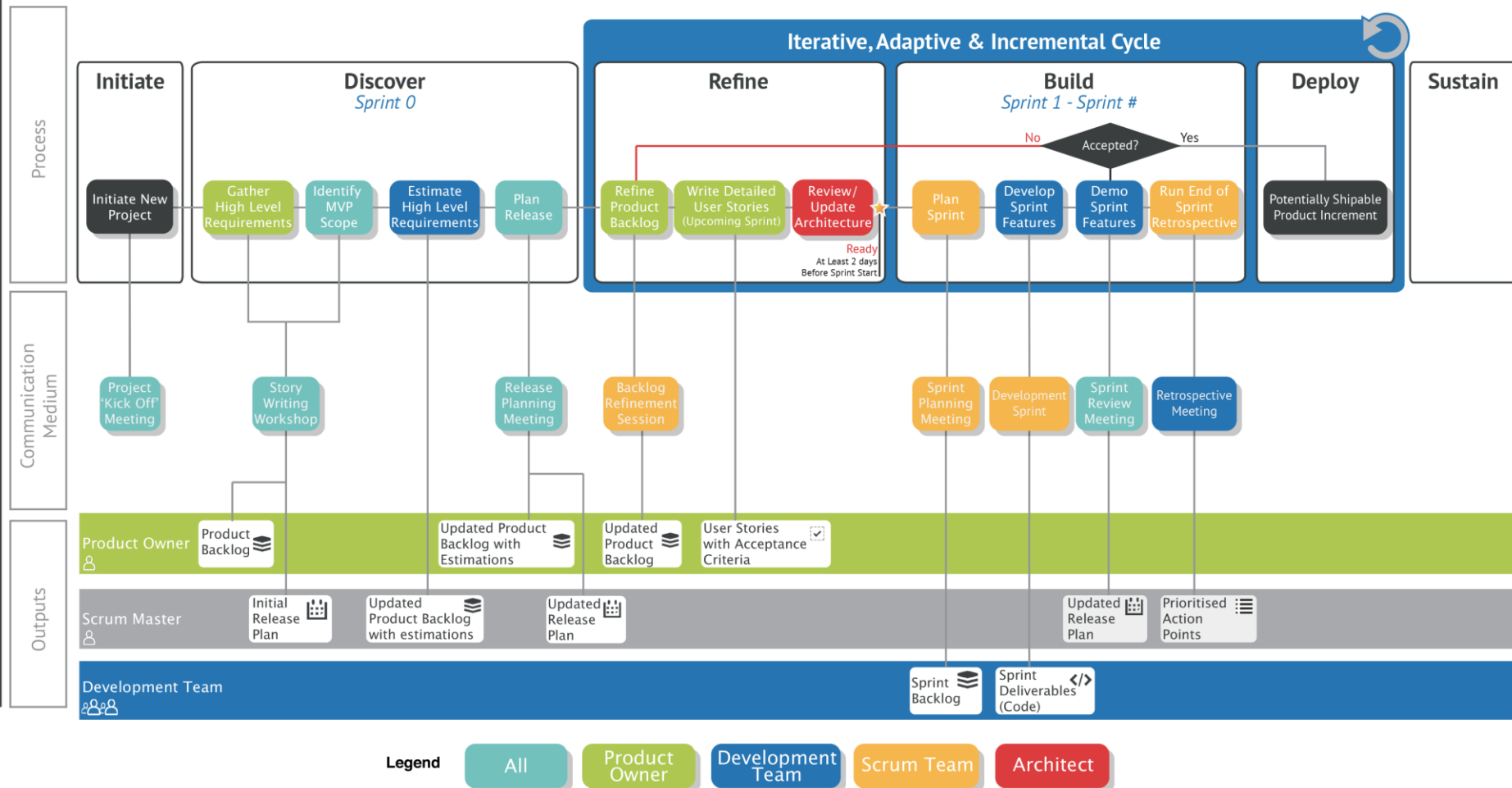
- ❑ Answer questions on any topic based on data
- ❑ Self trained Question & Answer application → Leverages FAQs

4.1. [MVP/MLP] Deliverables & Estimation (2 MM)

#	Features	Description	Est. (days)
1	[CM] Amplify CLI & Amplify Console	<ul style="list-style-type: none"> • amplify-category-api / auth / storage / analytics / notifications • amplify-codegen • amplify-frontend-javascript / android / ios 	2 * 3.0
2	Auth Screens	<ul style="list-style-type: none"> • Sign Up, Sign In, Logout, Forgot Password, Confirm Sign Up, Settings 	2 * 1.5
3	New Chat & New Chat Group	<ul style="list-style-type: none"> • New Chat & New Chat Confirm • New Group, New Group Confirm, Group Details 	2 * 2.5
4	Chat List	<ul style="list-style-type: none"> • Chat List 	2 * 1.0
5	Chat Room	<ul style="list-style-type: none"> • Chat Room: Header, Message Box, Message List • Chat Room Content: Text, Image, Audio, Video, File • Chat Room Quick-Replies: Send & Answer Quick-Replies • GEO-Location GMaps, Emoji, Speech-to-Text, Text-to-Speech 	2 * 5
6	DnD Drag-Drop Question & Answer	<ul style="list-style-type: none"> • SmallTalk & FAQ • Quick Replies • Multimedia: Text, Image, Audio, Video, File 	2 * 4.5
7	Integration & DevOps	<ul style="list-style-type: none"> • Chatbot for Website, Job4U.io (React), Job4U Mobile App (React Native) 	2 * 2.5


4.2. Agile Software Delivery Framework


Engagement and Business Readiness





M1. AuthN/Z Customizable Pre-Built UI-Component


1:50 PM


SmartChat

 OceanSoft

 OceanSoft.io@gmail.com






Password strength: **Strong**

☒ I agree to the Terms & Conditions.


SIGN UP


Already have a SmartChat account? [Log in!](#)

6:56 PM


SmartChat

Confirm Sign Up

 oceansoft.io@gmail.com


 Confirmation Code...


Lost your code? [Resend Code](#)


CONFIRM

[< Back to Log in](#)

1:49 PM


SmartChat

 OceanSoft.io@gmail.com



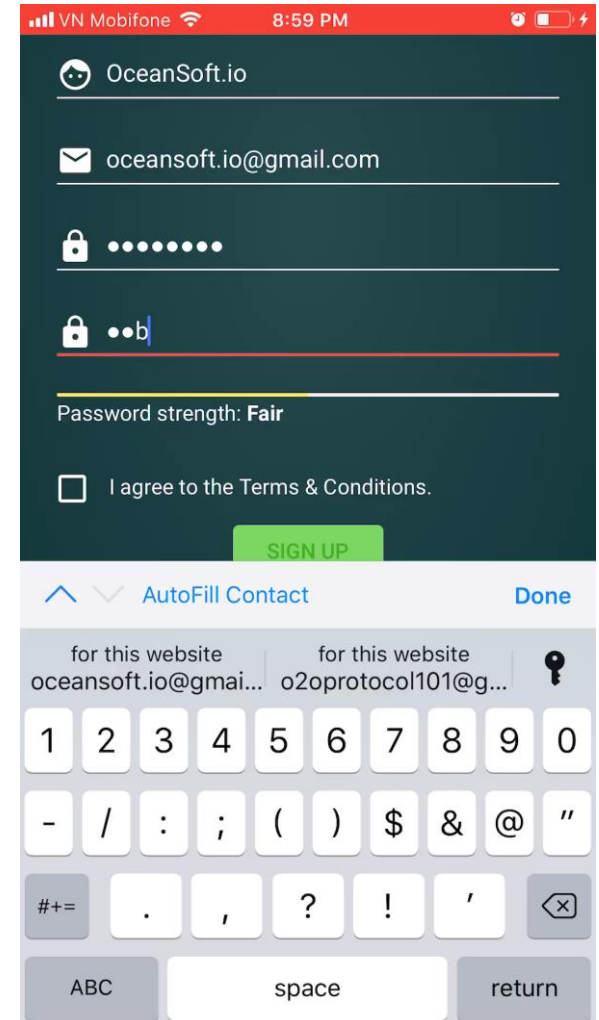
Forget your password? [Reset password](#)

LOG IN

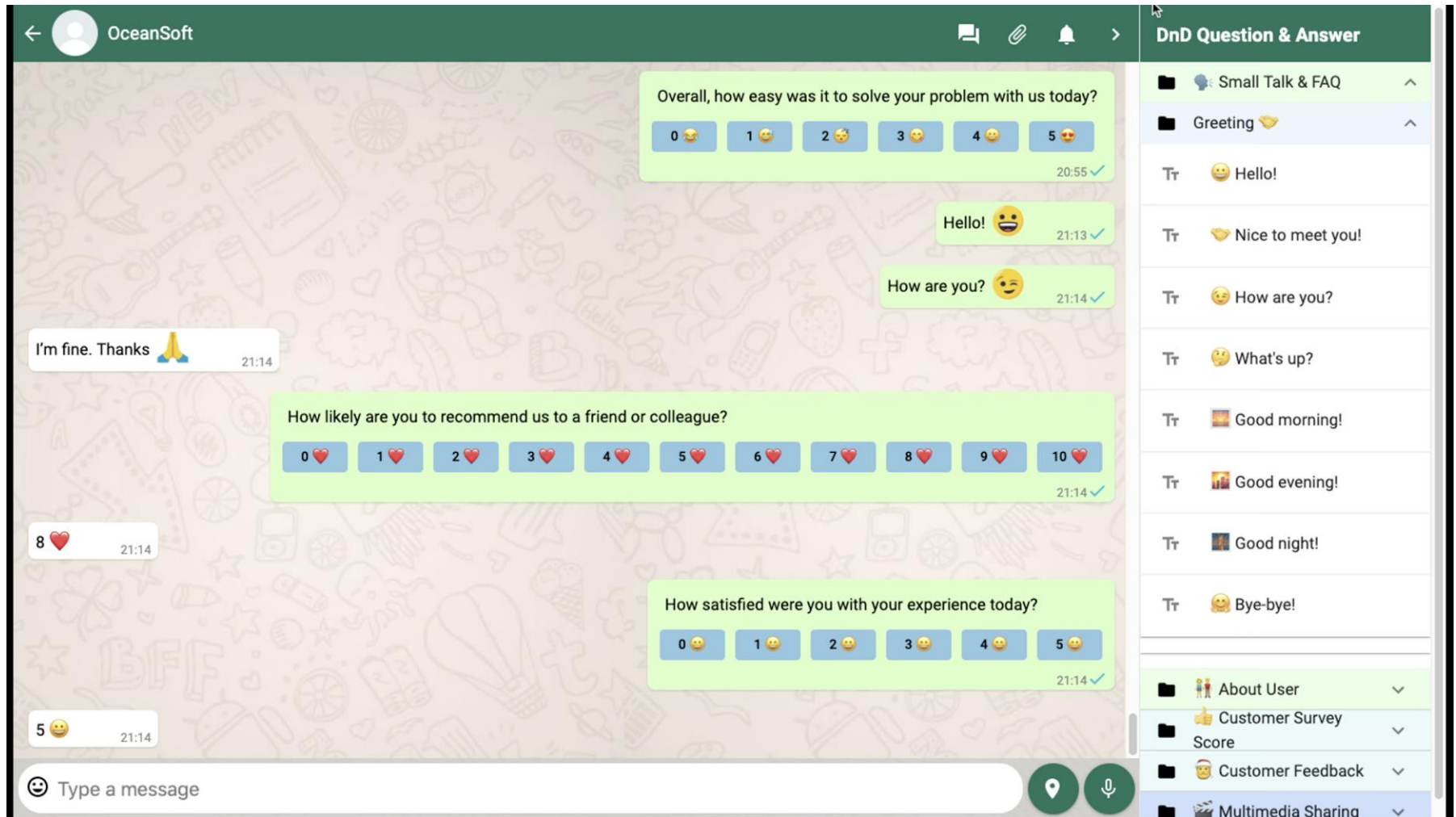
Don't have a SmartChat account? [Sign up!](#)

M2. Chat Room & Multimedia Sharing

- ❑ AuthN/Z: Sign Up, Sign In, Settings
- ❑ Chats Listing, New Chat & Chat Group
- ❑ Chat Room
 - 1. Text, Emoji
 - 2. Location Sharing
 - 3. Image, Audio, Video
 - 4. Text to Speech & Speech to Text
 - 5. Quick Reply
- ❑ DnD Question & Answer
 - 1. Small Talk & FAQ
 - 2. Survey
 - 3. Multimedia Sharing
- ❑ Others: Offline, Read Status



M3. DnD Question & Answer





Thank You!

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❑ Smart Chat:

- ❖ Live Demo: <https://smartchat.job4u.io>
- ❖ <https://devops.oceansoft.io/1.Product-Portfolio/5.WhatsApp-like-SmartChat/index.html>

❑ Chatbot for Website

- ❖ <https://devops.oceansoft.io/1.Product-Portfolio/7.ChatBot-for-Website/index.html>
- ❖ Live Demo: <https://chatbot.oceansoft.io>

❑ Amazon AWS re:Invent 2018

- ❖ <https://www.youtube.com/watch?v=0H5F0PI2-SU>
Real Time/Offline & AI/ML Capabilities in Modern Serverless Apps (MOB310)

❑ Open Sources

- ❖ <https://github.com/vbosstech/WhatsApp-Chat-Server>
- ❖ <https://github.com/vbosstech/WhatsApp-Chat-Client-React>

❑ OceanSoft

- ❖ <https://devops.oceansoft.io>
- ❖ <https://job4u.io>