

Whitepaper

# Experience Hyper-personalized **Banking, Powered by AI**



A Complete Guide for Banks to  
Unlock Customer Centricity  
through Hyper-personalization.

# Context

When was the last time you walked into a bank and wondered why it can't tailor its financial products to suit your preferences - just the way Netflix does, for instance? How often did you feel overwhelmed and frustrated by the one-size-catch-all marketing emails and cold calls by banks and financial institutions? I bet many banking customers feel the same way.

In today's digital era, buoyed by Netflix and Starbucks, customer expectations have evolved significantly across industries, including the banking domain. Customers now demand personalized experiences that cater to their unique needs and preferences. This shift in customer expectations, evolution of technology, and rising competition from FinTech firms is prompting banks to adopt hyper-personalization as a strategy to deliver exceptional customer experiences. Hyper-personalization leverages advanced technologies and data analytics to create tailored experiences for each customer.

**This whitepaper explores the concept of hyper-personalization in banking – its benefits, challenges, and best practices for successful implementation.**

A study by Forrester Consulting revealed that more than half of all decision makers readily admit that Hyper-Personalization is critical to driving improved customer engagement, loyalty, and reputation. A significant number also see it as a key building block to break down internal siloes and ensure real-time insights.

## Understanding Hyper-Personalization & Key Banking Use Cases

Hyper-personalization goes beyond the traditional methods by utilizing advanced technologies and data science to create bespoke experiences for each customer. It involves collecting and analyzing vast amounts of structured and unstructured customer data to gain insights into their preferences, behaviors, and needs. These insights are then used to deliver personalized recommendations, offers, and communication through various channels. Some of the most common use cases by banks are outlined below:

## **Personalized product recommendations based on spending patterns:**




Banks can analyze customer spending patterns to offer personalized product recommendations. For example, if a customer frequently spends on travel, the bank can offer travel rewards, credit cards or travel insurance products.

## **Tailored financial advice and goal-based planning:**



By analyzing customer financial data, banks can provide tailored financial advice and goal-based planning. For instance, if a customer has a specific savings goal, the bank can suggest suitable investment options to help achieve this.

## **Customized communication channels and messaging:**



Banks can personalize communication channels and messaging based on customer preferences. For example, a bank can mail relevant offers and updates to a customer, if they prefer email communication.


## **Other use cases:**

- Spend analytics: Insights on historical spends
- Spend predictions: Insights on tentative spends over upcoming weeks/months
- Deposit analytics: Insights on historical deposits
- Deposits predictions: Insights on expected (tentative) deposits
- Cash flow at account level: Insights on cashflow to keep customers aware of accounts' tentative statuses.
- Prediction of net cashflow across accounts: Insights on customers' summarized net cash flow
- Communicating personalized insights through various channels based on customer preferences

# Benefits of Hyper-personalization in Banking

Implementing hyper-personalization in banking can lead to several benefits for both customers and banks:

## Enhanced customer experience and satisfaction:



By delivering personalized experiences that cater to individual needs and preferences, banks can significantly enhance customer satisfaction. Customers feel valued when their unique requirements are met, leading to increased loyalty and advocacy. Banks can also become financial advisors through personalized financial planning and recommendations.


## Increased cross-selling and upselling opportunities:



By understanding customers' financial needs and behaviors, banks can identify cross-selling and upselling opportunities.

Hyper-personalization enables banks to offer relevant products and services at the right time, increasing the likelihood of conversions.

## Improved customer retention and loyalty:



Hyper-personalization helps build stronger relationships with customers, leading to improved retention rates. When customers receive tailored recommendations and offers that align with their financial goals, they are more likely to stay with the bank in the long term.

## Competitive advantage in a crowded market:



In today's competitive banking landscape, hyper-personalization can be a key differentiator. Banks that can deliver personalized experiences that exceed customer expectations have a competitive edge over their peers.

The Big Five American Banks have benefited from hyper-personalization in the areas of customer engagement, personalized assistance, fraud detection, and bespoke financial services. Many regional and digital banks strive to differentiate themselves through hyper-personalization.



# Challenges and Considerations

**Implementing hyper-personalization in banking comes with its own set of challenges and considerations:**

## **Data privacy and security concerns:**

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Collecting and analyzing vast amounts of customer data raises concerns around data privacy and security. Banks must ensure that they comply with relevant regulations and implement robust security measures to protect customer data.

## **Data quality and accuracy:**

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Hyper-personalization relies heavily on accurate and high-quality data. Banks need to invest in data management processes and technologies to ensure the integrity and accuracy of customer data.

## **Regulatory compliance and legal implications:**

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Hyper-personalization involves collecting and utilizing customer data, which may have legal and regulatory implications. Banks must ensure compliance with data protection regulations and obtain appropriate consent from customers.

## **Complexity in building machine learning models**

to bring in accurate predictions, recommendations and forecasting.



# Key Technologies Enabling Hyper-Personalization

**Several technologies play a crucial role in enabling hyper-personalization, especially in the banking industry, ranging from AI/ML to Natural Language Processing (NLP).**

## **Artificial Intelligence (AI) and Machine Learning (ML):**

AI and ML algorithms analyze vast amounts of customer data to identify patterns, preferences, and behaviors. Based on the insights leveraged, these algorithms can then make personalized recommendations and offers.

By leveraging AI and ML technologies in banking, users can be grouped based on their purchase and spend behaviors, and their future expenses and deposits can be predicted.

This can be further broken down into the types of users, and their accounts and behaviors, where different types of algorithms can be used to have a close look on the spends/ deposits pattern – thus predicting the next ‘n’ number of days as per the requirements and the data in hand.

Common ML algorithms that power AI-enabled hyper-personalized insights are ARIMA, SARIMA, SARIMAX, XGBOOST, and FBProphet. The results from using these algorithms are compared and the best-fit models are chosen. Also, the size and number of models used are optimized to fit any type/number of banking customers.

## **RASA**

Today, AI-based assistance in the form of bots, is playing a pivotal role in ensuring a great customer experience for banks. In this direction, RASA is a framework that allows the creation of custom chatbots or AI assistants and can be easily integrated with websites and other social media platforms. NLP enables RASA to interpret user conversations and provide respective responses to their queries. RASA comprises two major components – NLU and CORE.

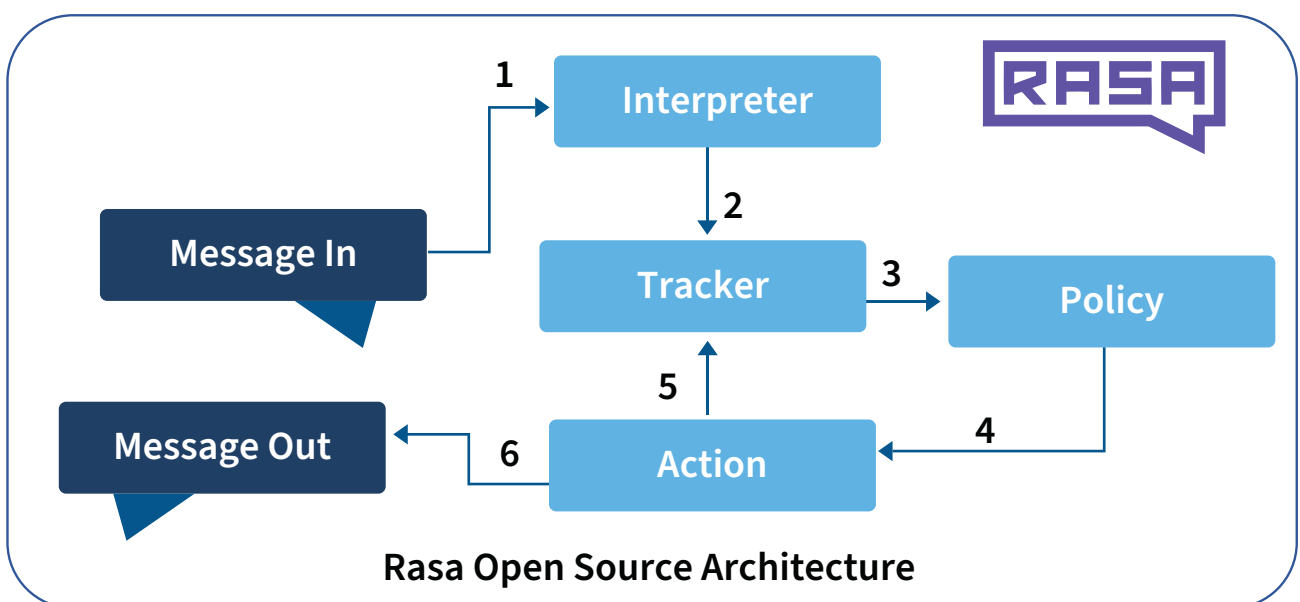
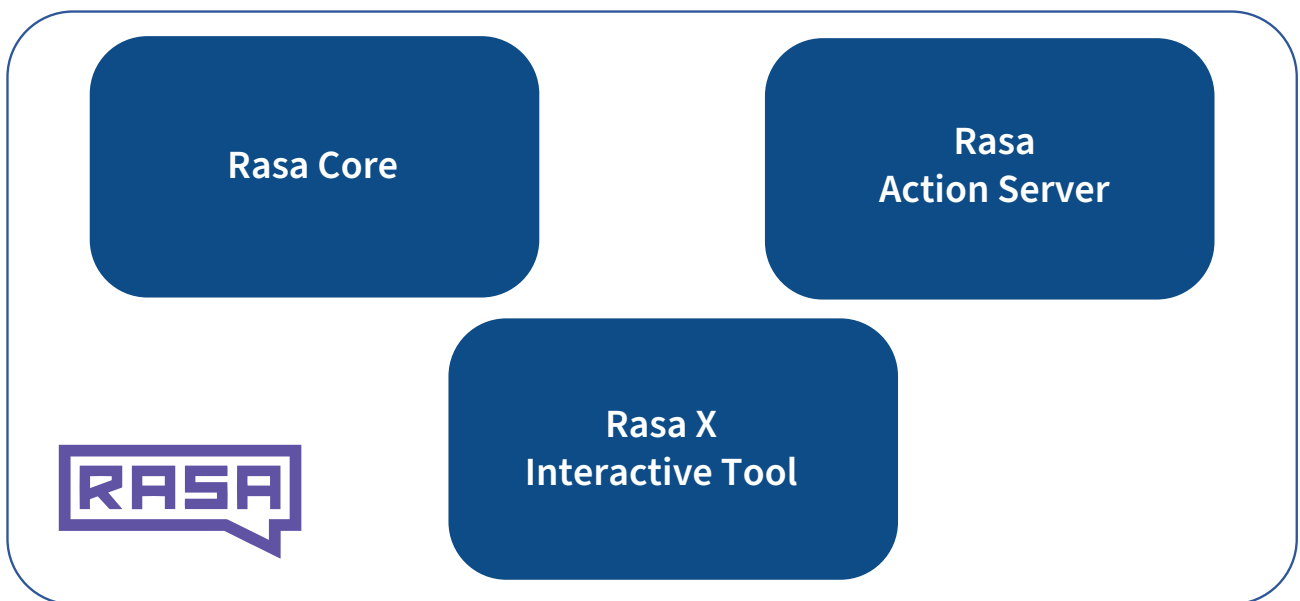
### **What is NLU?**

NLU stands for Natural Language Understanding. It involves transforming human language into machine readable format and is a branch of NLP. NLU is responsible for mapping each user input to a certain intent. RASA allows the customization of NLU through lexical analysis, word embeddings, transformers, and classifiers.

## What is CORE?

This is the function that is responsible for interaction tracking, session management and context management. Once the intent is identified by RASA CORE, according to the steps in the story, the relevant response is sent back to the chatbot.

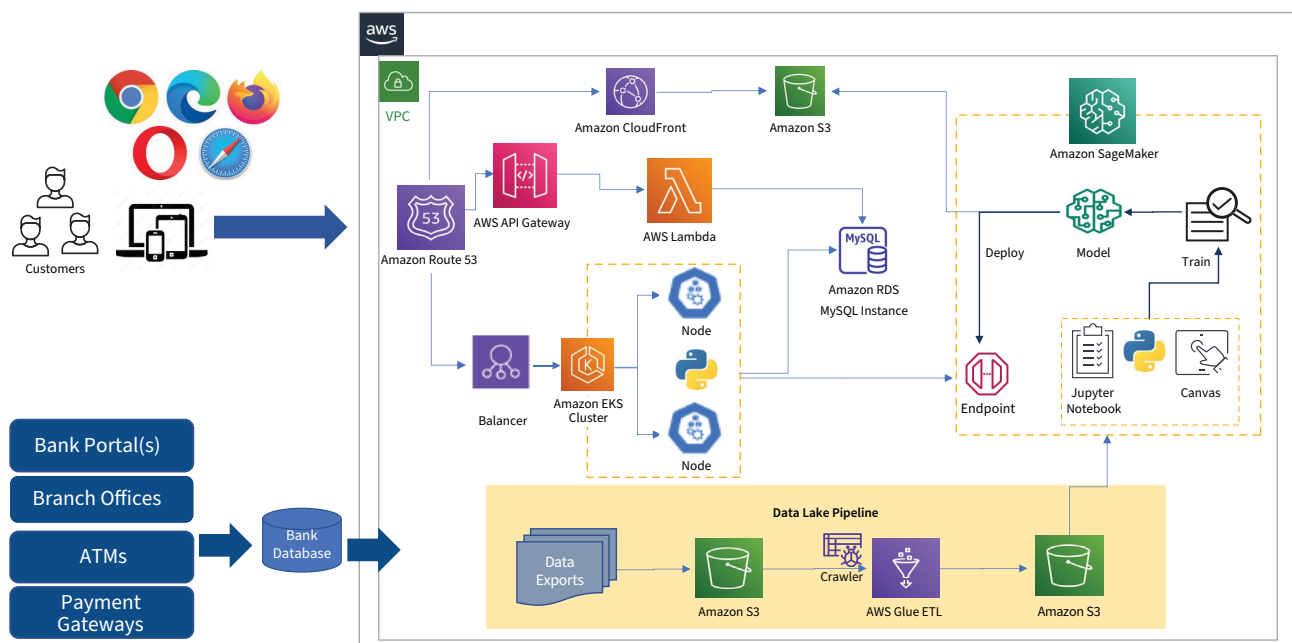
## Rasa Open Functional Components



# AWS Services: The Cloud Platform to Host Hyper-Personalization Artifacts

While hyper-personalization artifacts like ML models, databases, microservice KPIs, and user interfaces have been built predominantly with Python language, we have chosen AWS over the other cloud providers. This can also be deployed over GCP, Azure and other providers as well.

## Target State Architecture – Machine Learning Models for Insights



**AWS Lambda:** All the microservices are developed on top of AWS Serverless Lambda and exposed through API GW for UI, RASA Chatbot, and external consumers - while the APIs are secured with Lambda Authorizer.

**AWS Pinpoint:** Hyper-personalization leverages the Amazon Pinpoint service to send SMS text messages, in addition to push notifications and email. AWS Pinpoint has been utilized for marketing communications, which can scale on demand. It is flexible to design personalized messages to individual customers.

**AWS Cognito:** For customers' secure authentication and authorization, Cognito is used. Along with user credentials, it also captures a customer's profile details.

**AWS S3:** The S3 bucket is used to host the UI application and store artifacts.

**AWS Sagemaker:** To build, train and deploy prediction ML models on customer data, AWS Sagemaker is utilized.



**AWS EKS:** This service helps run Kubernetes in AWS cloud and on-premises data centers. It is a fully managed scalable service.

**Other major technologies:** Flask to create REST APIs, Python for Lambda functions, and Angular 14.2 and the HTML/CSS framework - Bootstrap 5.2 - for front-end development. Also, Docker, a lightweight container technology has been used.

# The Future of Hyper-Personalization in Banking


The future of hyper-personalization in banking is likely to be shaped by evolving technologies and customer expectations:

## New technologies and their impact on personalization:




As technologies such as AI, ML, NLP, and now, Generative AI, continue to advance at a break-neck pace, banks will have access to more sophisticated tools to enable them to deliver tailored experiences to customers.

## Integration of hyper-personalization across channels and touchpoints:



Banks will need to integrate hyper-personalization across various channels and touchpoints to provide a seamless and consistent customer experience. This integration will require robust data management and analytics capabilities. With Generative AI, the insights can be more contextualized based on what the customer has been looking for from the bank over a period of time.

## Predictions for the future of banking customer experiences:



In the future, banks will anticipate the needs and offer proactive solutions before customers even realize they have a problem.

# LTIMindtree's Offering in this Space:

We have the optimal capabilities to help banks provide personalized banking experiences to their customers through hyper-personalization. This sets the foundation for hyper-personalized banking with essential personalization use cases that are proactive and reactive in nature, built with ML models that leverage AI.

ID	Use Case	Description
1	Spend Insights	<p><b>Reactive:</b> Historical Spend Analysis by Expenses Categorization</p> <p><b>Proactive:</b> Future Spend Forecasting with Machine Learning Predictions</p>
2	Deposits Insights	<p><b>Reactive:</b> Historical Deposits Analysis by Deposits Pattern Categorization</p> <p><b>Proactive:</b> Future Deposits Forecasting with Machine Learning Predictions</p>
3	Net Cash Flow	<p><b>Proactive:</b> Future Cash Flow Forecasting with Machine Learning Predictions Leveraged for Deposits and Spends with current Balance</p>
4	Balance Enquiry	<p><b>Reactive:</b> Balance retrieval</p> <p><b>Proactive:</b> Inline Notification to Fund an Account based on Certain Constraints</p>
5	Virtual Assistant Chatbot	<p><b>Both Reactive and Proactive:</b> Serve Personalized Insights with User-friendly Conversations with Conversational AI</p>

We have also envisioned many other use cases for hyper-personalization in banking and financial services.

# Authors



## Pooja Shetty

Associate Principal - Software Engineering

Pooja is an accomplished digital frontend senior program manager with a proven track record in successfully delivering cutting-edge digital experiences. With close to two decades of experience in the dynamic landscape of software and web development, Pooja is a strategic leader who blends technical expertise, program management fitness, and innovation to drive transformative projects.



## Vineetkumar Sharma

Senior Specialist - Software Engineering

Vineet is a microservices architect and technical leader with over 13 years of experience in Java, Python, and AWS. He has a proven track record in delivering complex projects on time and within budget and is passionate about innovation and automation.



## Shraddha Saxena

Specialist - Software Engineering

Shraddha is a driven and accomplished software developer with a knack for problem-solving. She is experienced in leading and managing a team of engineers to build and ship production in on-premise and cloud applications. Shraddha has more than eight years of experience in application development in the banking and finance domain.



## Prashant Bhatt

Specialist - Data Sciences

Prashant is a Full Stack data scientist and MLOps with 13 years of experience. He has researched and developed ML/AI models, created end-to-end pipelines, and deployed models for many renowned clients and global organizations. He has a proven track record in delivering complex projects and POCs on time and is passionate about building high-performing models with cutting-edge technologies.



## Sai Praneeth Potturi Venkata

Senior Specialist - Software Engineering

Sai is a seasoned developer with over 10 years of experience in developing and designing microservices in Java. His expertise lies in Java, AWS Cloud services, and he is well-versed in building efficient and scalable systems that meet business needs. He is committed to delivering top-quality products and services that exceed expectations.



## Aravinda Raj D

Specialist - Software Engineering

Aravinda Raj has 11+ years of experience in frontend development with Javascript frameworks. He is proficient in CSS3, HTML5, NodeJs, AngularJs, Vue.js, and Angular 14 skills. Aravinda also possesses strong coding fundamentals and standards.

“ We would like to extend our heartfelt gratitude and appreciation to Arun Kaul – VP, Banking and Financial Services and Arun Lakshmanan - AVP, Banking and Financial Services for their invaluable mentorship and guidance in the drafting of our hyper personalization whitepaper”

# Summary

Hyper-personalization has emerged as a game-changer for banks seeking to deliver exceptional customer experiences and fight competition. By leveraging advanced technologies and data analytics, banks can create highly tailored experiences that cater to individual customer needs and preferences. However, implementing Hyper-personalization comes with its own set of challenges and considerations, including data privacy, data quality, and regulatory compliance. By following best practices and continuously monitoring and improving the personalization process, banks can unlock the power of customer-centricity and gain a competitive advantage in the crowded banking market.



## About LTIMindtree

LTIMindtree is a global technology consulting and digital solutions company that enables enterprises across industries to reimagine business models, accelerate innovation, and maximize growth by harnessing digital technologies. As a digital transformation partner to more than 700 clients, LTIMindtree brings extensive domain and technology expertise to help drive superior competitive differentiation, customer experiences, and business outcomes in a converging world. Powered by 82,000+ talented and entrepreneurial professionals across more than 30 countries, LTIMindtree — a Larsen & Toubro Group company — combines the industry-acclaimed strengths of erstwhile Larsen and Toubro Infotech and Mindtree in solving the most complex business challenges and delivering transformation at scale. For more information, please visit <https://www.ltimindtree.com/>