

A close-up photograph of a middle-aged man with a grey beard and mustache, smiling warmly as he looks down at a smartphone held in his hands. He is wearing a blue and white plaid shirt. The background is softly blurred, suggesting an indoor setting with natural light.

**BEING  
RESILIENT**

**TRANSFORMING  
CUSTOMER  
ONBOARDING  
WITH AI**

**Infosys**<sup>®</sup>  
Navigate your next

BEING RESILIENT. THAT'S LIVE ENTERPRISE.

## Abstract

COVID-19 has forced social distancing and is compelling us to live with minimal human contact. Banking industry remains no exception and hence few banks have decided to close few of their branches, contact centers during this crisis to minimize

the risk on banks and their employees. This is the time when banks and regulators globally need to realize that digital customer onboarding & video KYC are no longer just options but a necessity - for customer due diligence and liveness check in order to perform customer onboarding and KYC remotely. Reduced risk of

contamination, resiliency in any pandemic situation and speed of onboarding are distinct advantages such a solution offers. In fact, today's advances in AI and ML allows banks to set up a "front to back" straight through processing without any human intervention for most common customers.

## Introduction

In the 20th year of 21st century we still see banks grappling with numerous onboarding systems and that too bit disconnect. Banks do follow some standard practices, but it is a fact that today it takes more than three weeks on an average for most large global banks to onboard new customers. The big debate is, even in this digital era of doing operations, is it fast enough to onboard a new customer in three weeks? Customer onboarding is the first touch point where customer gets the first experience and impression about the bank and in return, bank get the opportunity to delight their new customer for the first time. But the scenario is worse in both consumer and commercial banking. This results in poor customer experience and potential customer dropout. Today's onboarding processes are still to a large extent paper driven and people dependent, with multiple forms, manual compliance checks, in-person identification checks and demand face-to-face interaction. For incumbent banks

the challenge is more, as they still believe in in-person verification, verifying original documents and some are also maintaining their best-in-class hard copy submission to clutter their bank's shelves with one more file which will possibly never get referred again in the customer lifecycle. The mindset must be changed immediately towards adopting design thinking and digital transformation.

COVID-19 is creating an unexpected interruption and impact for banking industry. This is also resulting in a global slowdown – possibly towards a recession. Already UN Conference of Trade and Development has reported estimated losses nearing \$1 trillion globally in 2020. The repercussions are much more as western countries have started experiencing job losses and loans are moving into delinquency causing a direct impact on bank's income and profitability. Therefore, banks acquiring new customers and increasing their customer base for their existing products and services is a key to survival.



## Challenges in Legacy Customer Onboarding

### Time to Onboard

Time, cost and compliance are three critical aspects of customer onboarding.

A Forrester research estimates that it takes somewhere between 2 to 34 weeks approximately for a bank to onboard customers in a manual process, 2-12 weeks for a bank with partial automation and finally, for banks with a

fully mature process it takes less than 6 weeks. Another Thomas Reuter survey disclosed customer onboarding time across banks increased 22% in one year which resulted in 24 days to onboard a customer.

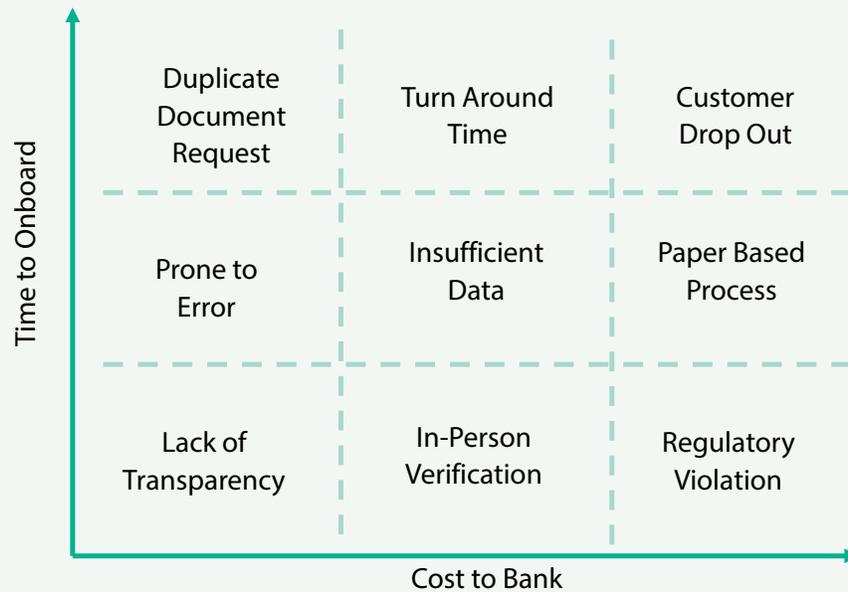
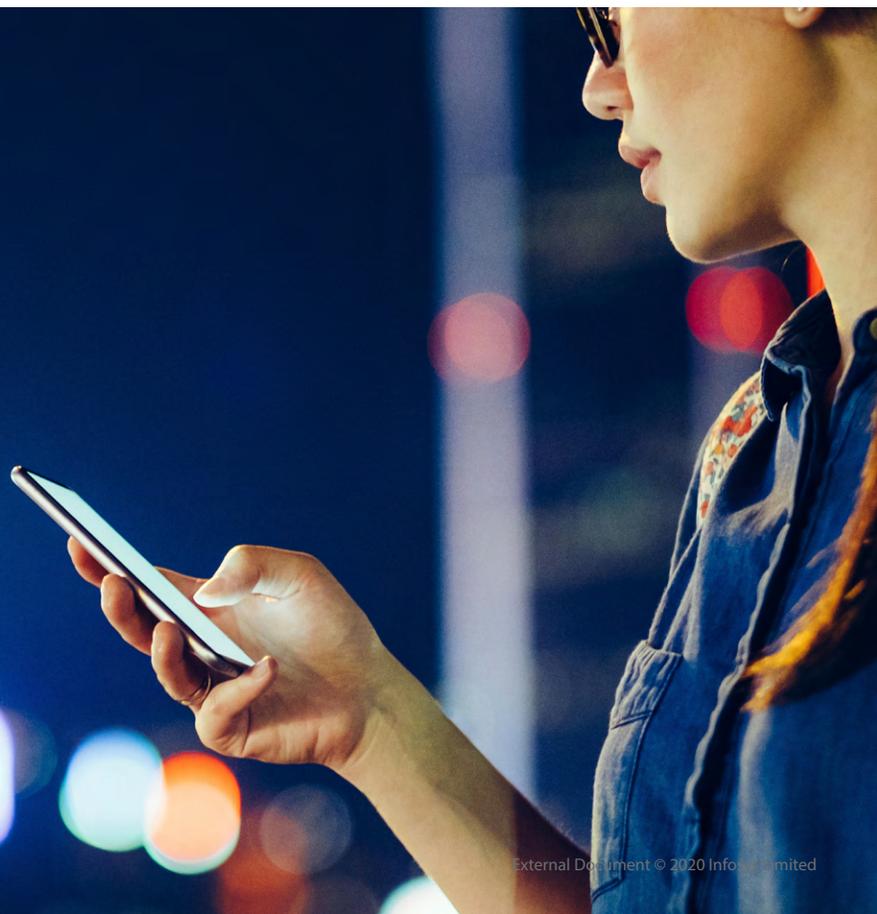


Fig1. Matrix representation of customer onboarding challenges

### Cost to Bank

A recent research revealed that global banks spend an average of USD\$48m annually in onboarding new customers which is increasing 15% year over year. Due to stringent regulations, onboarding of a business customer could even take more than 30 days. The fragmented nature of customer onboarding process makes it expensive for banks to operate on traditional models that are more human dependent. A research shows banks could potentially lose \$22.75bn due to slow onboarding processes. A report clearly states 35% of bank customers moving to competitors are due to poor experiences in onboarding.





Code	Product	Price	2014	2015	2016	Total
T001	RICE	120	1200	1320	1440	3960
T002	PORK	100	900	750	850	2500
T003	CORN	85	600	2500	700	3900
T004	PEANUT	150	750	2800	900	4450
T005	CHICKEN	150	2000	840	770	3610
T006	COCONUT	150	700	600	300	1600
T007						

## Digital Onboarding – Why is it the need of the hour for banks across the globe

In the last few years digitization has been the key for banks and when topped with advanced technology, the possibilities are limitless. Initiating customer journey using their social media login has become

the new way of customer registration. Gathering customer data with minimal inputs from customer side is the new way of convenience. Connecting with numerous data centers and databases of government and private data providers has become the necessity for a realtime turnaround. Alternates to physical

presence, in-person verification is the need of the hour especially in current situations like COVID-19. Using geolocation tagging now it is possible to identify exact physical location of a customer. Advanced technology such as AI/ML can enable video conference to check liveness of a customer.



Fig2. Traditional customer onboarding in banks

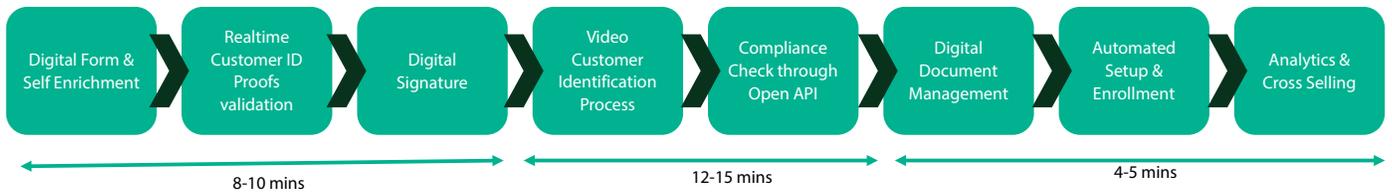


Fig3. Digital customer onboarding

Digital customer onboarding enables to drastically reduce the time to onboard customers, addressing the prominent challenges faced by the global banks. VCIP or Video based Customer Identification Process could be a path breaking solution

for banks as this can be adapted across geographies with the support from Central banks and regulators and in collaboration with proper technology enablement. In legacy customer onboarding the time taken gets

drastically reduced from 8-20 days to almost 30 mins. The dramatic reduction in time to onboard is a definite reason why banks should rethink in addition to the reasons caused by the current pandemic situation.



## Digital customer onboarding framework on 4i principles – applicable across global banks

Across geography there is greater emphasis on knowing the customer with whom the bank deals with. Underlying intention for banks is to safeguard their reputational risk preventing terrorist financing, money laundering and financial

crimes. With time, customer onboarding has undergone enormous changes in order to adapt to the new age digital transformation in the banking industry and become substantially complex. Data is the heart of digital onboarding of customer and based on data, this end-to-end process is simplified into four key functions – imbibition, ingestion, incubation and illumination.

### Imbibition

Imbibition is creating a data concentration by accumulating data from different sources and capturing information from initial customer interaction or the process of electronic application. Customer profile building and making an initial perception of the customer along with building an early hypothesis is possible from availability of enough customer data.

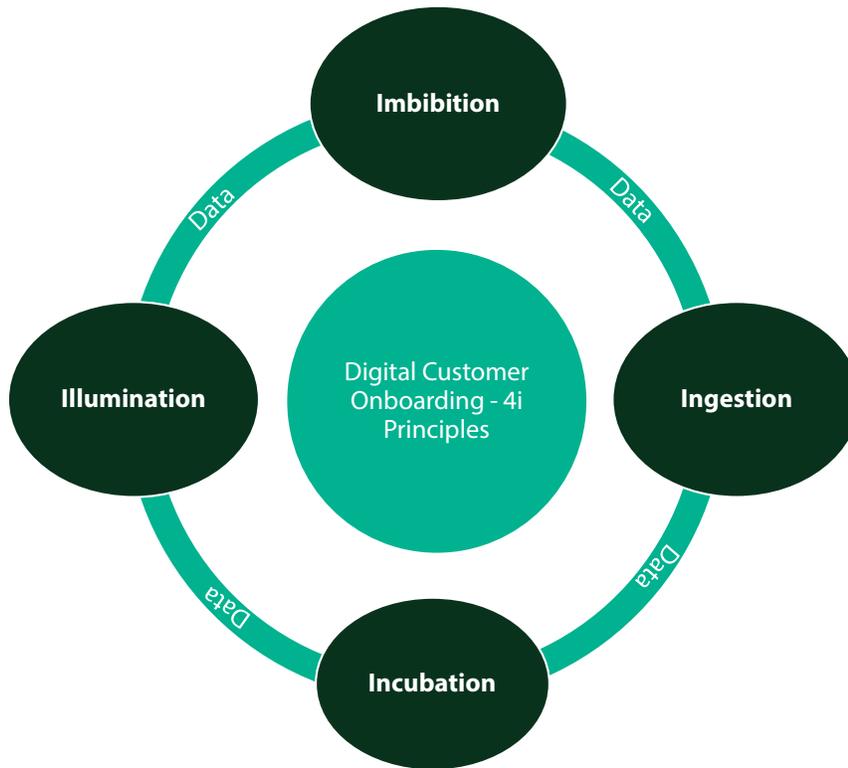


Fig4. Digital customer onboarding – 4i principles

### Ingestion

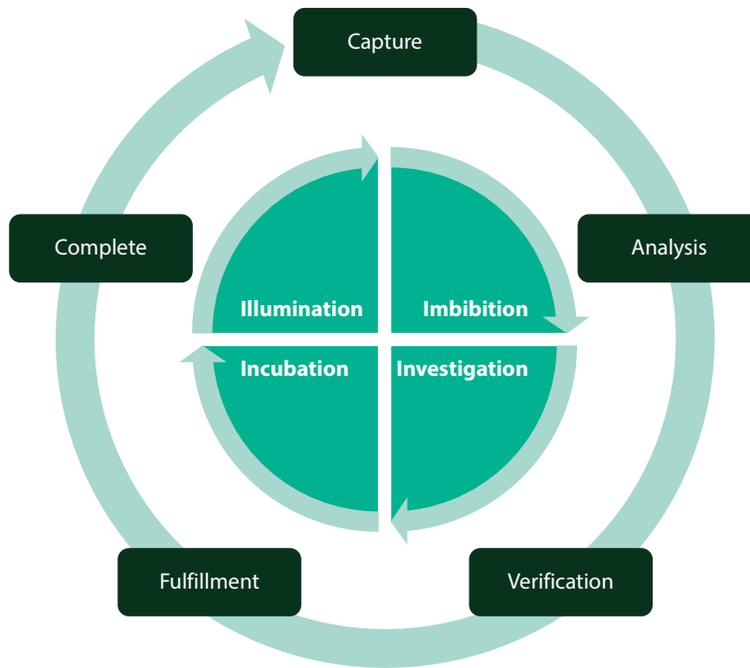
Absorbing quality data from several sources and deriving value out of it on real-time is ingestion. This is a deeper dive into the customer data. This is to reject or fail to reject the null hypothesis based on every clue identified from data including social media actions. This is the stage of analysis and verification of customer data from

internal and external sources including fulfillment of any pending or insufficient data. Thus, this process is much beyond the traditional investigation phase in a legacy customer onboarding process.

### Incubation

Incubation is striking the right balance between compliance and meeting

customer requirements. This includes identifying the best suitable term, credit limits, interest rates, fees & charges, reward system and then followed by a legal agreement. This ensures the customer data and the risk associated with the customer are fitted to the model in right proportion to identify if this meets the bank's thresholds.



*Fig5. Stages in 4i principles*

**Illumination**

At this stage, the digital customer onboarding will be complete with final steps of enrollment and account creation. This automatically ensures that

a new entity and new account setup gets completed with the right level of entitlements and the information is shared or highlighted to the right owners. A real-time tracking gets updated including

necessary notifications and a report gets triggered. Also, for cases where onboarding is yet to be completed, downstream processes like analytics and cross selling gets initiated.



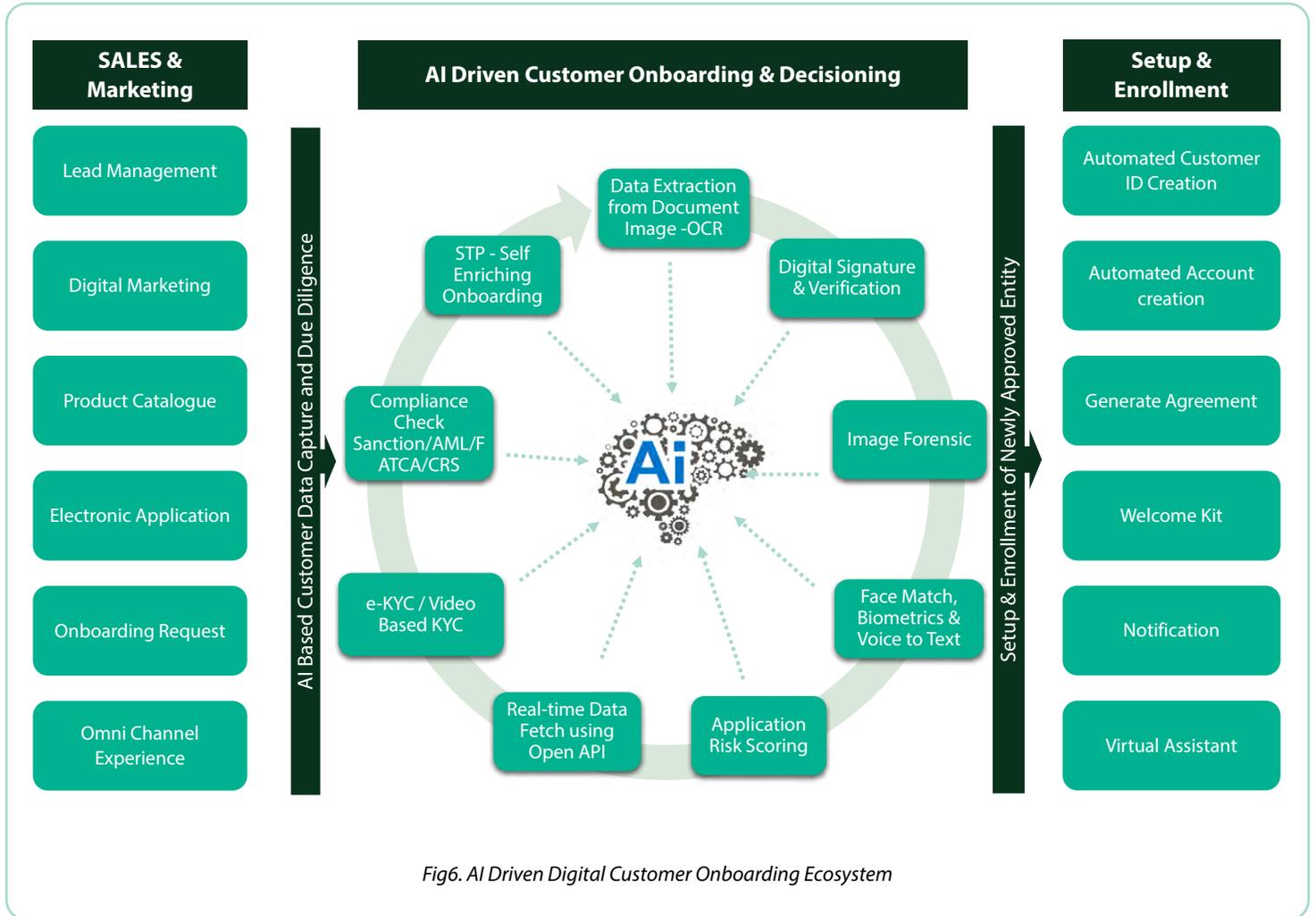
## AI Driven customer onboarding ecosystem – A typical business architecture

A holistic next generation digital customer onboarding process incorporates some unique capabilities. A few examples are

OCR driven data capture, image forensic, facial recognition, realtime compliance check, forgery check, digital signature, etc. Most importantly these need to adhere to compliance in individual liveness check with an end-to-end automated digital straight through process using

artificial intelligence and machine learning algorithm.

AI driven digital customer onboarding ecosystem focuses on key factors which address reduction in costs for the banks and enhances the speed of customer onboarding in an integrated fashion.



### Digital data extraction through OCR:

Optical Character Recognition (OCR) enables zero manual entry extracting data out of image of customer documents accurately. Imagine the customer experience where customer can take a photograph of a document and upload from mobile phone. OCR does the rest of form filling for the customer.

### Integrating Open API

Real-time collating of customer relevant data from different source such as credit bureau, state id database, passport and many more with seamless access to third-party databases using Open API. This enables minimizing fraud risk through real time analysis and validation of

customer data. This eliminates the time spent for enhanced due diligence (EDD) which often slows down the process. Aspiration, a California based online bank has been already leveraging Open API in fetching data from diverse sources and offering digital customer onboarding with enhanced fraud prevention.

## Machine learning and deep learning in image forensic

Machine learning and deep learning enable cross verification of customer data across documents, but also validates the right ownership of the documents. Real-time customer photograph is captured and the same is cross validated with all the photo ids submitted by customer using machine learning and deep learning-based image forensic. Asian banks such as ICICI Bank, Axis Bank, DBS are reaping the benefits of ML and deep learning in classifying document images reducing turnaround time. There are a number of global banks which have also adopted biometrics, facial and voice analytics in digital customer onboarding.

### e-KYC / video-based KYC

The demand for e-KYC and video-based KYC has started shooting up suddenly due to the current pandemic situation. A projected market size for e-KYC seems to exceed USD 1000 million By 2026. A German neo bank N26 introduced a fully online onboarding in less than 10 minutes, including ID verification and anti-impersonation performed via live video chat. Customers are guided through the process on a simple and clear interface.

### Real-time compliance check

Banks globally paid more than \$15 billion for regulatory violations of client

onboarding gaps, including many banks for violation of key regulations associated with customer onboarding. For example, Morgan Stanley paid \$10 million for violation of AML. N26 Bank has also introduced realtime AML and counter-terrorism financing checks during onboarding.

### AI-Based decisioning

Digital customer onboarding implements a holistic next generation customer onboarding and decisioning enabling digital straight through process using artificial intelligence, machine learning algorithm and NLP. The training of the data may take from anywhere between six weeks to three months. This depends on the complexity of the geography and the presence of variance in the customer data. However, the versatile nature of AI-ML algorithm ensures the data gets trained with accuracy in a shorter timeframe and meets the threshold defined by each bank as per their business risk appetite. Brazil's largest investment Banks BTG Pactual has introduced AI based decisioning in digital customer onboarding. ICICI Bank has launched AI based decisioning and digital onboarding.

### Analytics & data science in reducing customer dropout

When it comes to customer onboarding in the financial sector, 40% of consumers

abandon bank applications before they are complete. Analytics ensures customers are engaged with specific personalization and keeps the customer's interest up so as to accomplish onboarding till completion through cross sell, up-sell and reward mechanisms.

### Virtual digital assistant

Chatbots and conversational AI has evolved as a new medium for banks to help customers at every step like a friend in need. Large banks like HSBC and RBS already implemented Virtual Digital Assistant as part of their customer onboarding which enhanced their customer engagement. Scandinavian bank Nordnet has launched Amelia for guiding customers in the end to end digital onboarding journey.

### Handling exceptions

Thanks to advanced AI such as neural network which ensures best possible results even with changing input in customer image and actions during the video conversation. This also ensures images of the documents submitted by the customer get classified correctly. This leads to very a smaller number of cases falling into the exception queue leading to manual verification.

## Limitations of the digital customer onboarding framework

The digital customer onboarding ecosystem and the 4i-principles have some critical dependencies and thus have some constraints too. In order to take the most benefits out of this framework banks need be mindful of these constraints.

### Quality data

Most of the time the tendency is to get more data points. However, quality data is the key. Digital customer onboarding framework will not be able to address the key challenges unless the data quality is high.

### Data wrangling

Having only data and number of sources will not solve the purpose. An effective data wrangling process is much important. As the data grows in leaps and bounds it is important to have an efficient wrangling process in order to ensure minimum data losses and increasing the efficiency of the 4i-principles.

### CX (Customer eXperience)

Customer experience is the key and therefore seamless transition of user navigation and omni channel capabilities are important. Easy to use, app-based, online and mobile channel

compatibility and 24x7 accessibility are some basic expectations today's customer has from the onboarding process. Excessive customer dropout adds to more costs for banks than the cost of converting a customer.

### Training time & process maturity for model adoption

Digital customer onboarding framework is based on AI-ML principles. Hence data training time needs to be factored in for implementation in a bank in any new geography. With increase in maturity the training time will get reduced and hence model maturity is critical for expected outcomes.

## Reaction of regulators & banks towards digital customer onboarding

Different regulators in different geographies have reacted to digitization and digital customer onboarding. However, the demand from banks are rapidly increasing to address limitations in legacy onboarding processes as well as to tackle economic hurdles due to situations like the current, unexpected global pandemic situation.

- **EU Electronic Identification, Authentication and Trust Services (eIDAS)** Digital ID has enabled customers from France to open bank accounts in UK. This had made cross border account opening possible and digital transaction using eIDAS based on various digital authentication methods such as eSign, digital signature and timestamp.
- **Fifth Money Laundering Directive (5AMLD)** came into force Jan 2020 for EU countries allowing digital products and video identification possible throughout the whole European regulatory

framework.

- iDIN Acquirers comprising of several Dutch banks such as **ABN AMRO, Rabobank and ING** have jointly initiated the safe digitization of the Dutch economy without compromising security and privacy.
- In **Australia**, government issued identification documents are verified against Document Verification Service (DVS) which is an online system from Department of Home Affairs in order to comply with KYC, Anti money laundering (AML) and Combating of Financing of Terrorism (CFT) legislations.
- **The Swiss Financial Market Supervisory Authority, Finma**, introduced selfie-based authentication and liveness detection. Finma already has guidelines for financial services firms to conduct video and online identification for new client onboarding in compliance with AML rules.
- Regulators like **Spanish SEPBLAC** have already been a pioneer in introducing video identification in

digital onboarding process while customers are being allowed to show ID cards through computer webcam or smartphone camera to complete KYC process.

- In India, **RBI** introduced **Aadhar** in the list of Officially Valid Document (OVD) and allowed electronic KYC (eKYC). In 2020, RBI has allowed financial institutions to implement **Video-based KYC** through **Video Customer Identification Process (VCIP)** adhering to bank agent-based video verification.
- **Citigroup China Beijing-headquartered Didi** transformed their client onboarding to become complete digital
- **RBS NatWest** enabled selfie based Current Account opening and photo id using AI, realtime biometrics and fraud checks.
- **Rabobank & ING** are using UK based iProov's facial recognition, biometrics and OCR technology in verifying customer ID authenticity during digital onboarding process.

## Strategies for banks to adopt – A way forward

Globally, digital customer onboarding is already receiving wide acceptance. With an increasing number of regulators approving complete digitization, banks would need to start thinking ahead. They need to plan introducing digital customer onboarding through transformational programs in an organic method or in an inorganic way by aligning with Fintech solutions.

- Account opening through video identification
- Biometrics and face match in authentication and cross reference document validation
- Fetching realtime customer data and validation from government and third-party vendors
- Developing a digital identify framework with 'Identity Accreditation Process'
- End-to-End automation including enrollment and account setup using robotic process automation (RPA)
- Contactless customer onboarding using electronic ID cards
- Mobile app-based customer onboarding platform
- Best in class customer eXperience based on omni channel strategy

## Conclusion

In this challenging economic environment, creating an impactful first impression to clients is essential for banks. It is a difficult time for customers to avail products and services globally, and an equally difficult time for banks too, in providing services and support. This is the right time for banks to move out of the dependency on legacy paper-based customer onboarding processes. This is the time when banks should start leveraging the best value from customer data and build a digital banking customer onboarding platform as per the strategies discussed. This will help banks to extend their current offerings and enhance their market presence. This will not only ensure banks to stay ahead of the competition but will also lay a foundation for the future digital bank.



## About the Author



**Mandar Joshi**, *Senior Industry Principal, Infosys Financial Service*

Mandar is a Senior Industry Principal in Infosys Financial Service business unit. He is responsible for banking and capital market segments at Domain Consulting Group. Mandar has a proven track record of building and leading technology and consulting teams in financial services technology. His expertise includes leadership, technology consulting, and strategic program implementations.

Mandar is closely involved with many transformation programs that Infosys is delivering for its clients. These include programs like implementation of Digital strategies, Legacy modernization and adopting new cost models.

He is also associated with developing FinTech ecosystem to deliver focused solutions to solve challenges faced by clients in dealing with COVID aftermath.



**Abhik Kar**, *Principal Consultant, Infosys Financial Services*

Abhik is a Principal consultant with Banking Practice as part of Financial Services – Domain Consulting Group within Infosys. The majority of Abhik's 12-year consulting experience spans across consumer banking domain, where he currently continues to actively work on several engagements on digital transformation, process modernization & automation in conjunction with new age technologies AI-ML. He has extensively worked for large global banks across the US and UK in several business & technology initiatives.

## References

- <sup>i</sup><https://news.un.org/en/story/2020/03/1059011>
- <sup>ii</sup><https://www.forbes.com/sites/forbestechcouncil/2018/07/10/know-your-customer-kyc-will-be-a-great-thing-when-it-works/#511f31898dbb>
- <sup>iii</sup><https://www.forbes.com/sites/forbestechcouncil/2018/07/10/know-your-customer-kyc-will-be-a-great-thing-when-it-works/#4ff01bb18dbb>
- <sup>iv</sup><https://thefintechtimes.com/slow-onboarding/>
- <sup>v</sup><https://www.experian.co.uk/assets/business-services/brochures/digital-onboarding.pdf>
- <sup>vi</sup><https://www.americanbanker.com/news/aspiration-bank-lowers-onboarding-risk-with-apis>
- <sup>vii</sup><https://www.finextra.com/blogposting/18180/how-asian-banks-are-revolutionizing-the-customer-onboarding>
- <sup>viii</sup>[https://www.marketwatch.com/press-release/global-e-kyc-market-size-projected-to-reach-usd-101536-million-by-2026-facts-factors-2020-02-13?mod=mw\\_quote\\_news](https://www.marketwatch.com/press-release/global-e-kyc-market-size-projected-to-reach-usd-101536-million-by-2026-facts-factors-2020-02-13?mod=mw_quote_news)
- <sup>ix</sup><https://onlyonce.today/open-an-n26-account/>
- <sup>x</sup><https://in.reuters.com/article/morgan-stanley-fine/morgan-stanley-unit-to-pay-10-million-fine-for-anti-money-laundering-violations-idINKCN1OP0YR>
- <sup>xi</sup><https://www2.deloitte.com/content/dam/Deloitte/lu/Documents/technology/lu-digital-onboarding-financial-services-digital-natives-112017.pdf>
- <sup>xii</sup><https://www.nsbanking.com/news/brazils-btg-pactual-streamlines-digital-onboarding-with-jumio/>
- <sup>xiii</sup>[https://www.business-standard.com/article/finance/icici-bank-s-digital-push-sets-up-innovation-lab-enters-fintech-tie-ups-118052500580\\_1.html](https://www.business-standard.com/article/finance/icici-bank-s-digital-push-sets-up-innovation-lab-enters-fintech-tie-ups-118052500580_1.html)
- <sup>xiv</sup><https://www.citi.com/commercialbank/insights/assets/docs/2018/The-Bank-of-the-Future/files/assets/common/downloads/The%20Bank%20of%20the%20Future.pdf>
- <sup>xv</sup><https://wup.digital/blog/digital-onboarding-banking/>
- <sup>xvi</sup><https://ec.europa.eu/digital-single-market/en/trust-services-and-eid>
- <sup>xvii</sup><https://www.abnamro.com/en/newsroom/newsarticles/2019/dutch-banks-join-forces-to-fight-money-laundering.html>
- <sup>xviii</sup><https://www.zdnet.com/article/over-1000-private-entities-are-using-australias-document-verification-service/>
- <sup>xix</sup><https://www.finextra.com/newsarticle/31690/swiss-watchdog-tweaks-digital-onboarding-rules>
- <sup>xx</sup><https://www.electronicid.eu/en/blog/post/digital-onboarding-banking-sector-use-case/en>
- <sup>xxi</sup><https://www.rbi.org.in/commonman/English/scripts/notification.aspx?id=2607>
- <sup>xxii</sup><https://knowyourcustomer.com/digital-onboarding-didi/>
- <sup>xxiii</sup><https://www.rbs.com/rbs/news/2019/06/natwest-current-accounts-can-now-be-opened-with-a-selfie.html>
- <sup>xxiv</sup><https://www.biometricupdate.com/202002/iproov-expands-biometric-security-operations-to-u-s-with-new-hq>

For more information, contact [askus@infosys.com](mailto:askus@infosys.com)



© 2020 Infosys Limited, Bengaluru, India. All Rights Reserved. Infosys believes the information in this document is accurate as of its publication date; such information is subject to change without notice. Infosys acknowledges the proprietary rights of other companies to the trademarks, product names and such other intellectual property rights mentioned in this document. Except as expressly permitted, neither this documentation nor any part of it may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, printing, photocopying, recording or otherwise, without the prior permission of Infosys Limited and/ or any named intellectual property rights holders under this document.