White Paper

Internet of Things
Retail Banking

Vision Analytics bridging the gap between the physical and digital channels

AI powered Solution transforming the Banking Industry

meld CX intel.

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Introduction

Organizations today look forward to AI driven technologies to analyze data, trends, and performances. The traditional ways to analyze data are not only time consuming but also require a lot of manual tracking and data collection. With growing competition and time constraints, organizations need to make quicker decisions to win more customers and achieve goals.

The pandemic has reinstated a reset mode, making enterprises relook at their existing business models and accelerating their digital first approach.

The technologies available have fueled digital transformation, and the banking sector is going through a huge transformation phase to provide real-time digital banking solutions to its customers. Top banking institutions see real-time as a critical component of meeting consumer expectations and achieving higher customer satisfaction. While most banking institutions want to know how their digital campaigns are performing in-branch, only a few handfuls have the tools or processes in place to measure it.

Vision Analytics is an emerging technology and is being rapidly adopted by organizations across all sectors. It applies deep learning techniques on images and live video streams collected from the surveillance cameras. This technology has augmented the banking institutions to make data driven decisions and helped them extract insights on various aspects, thus giving more visibility of ROI and areas of improvement. In turn, it has influenced banks to give better customer experience for banking services delivered across the physical and digital channels such as branch networks, website, and mobile application.

In this document, we will first understand the need for banks to adopt Vision Analytics technologies, and then dive into how Vision Analytics solution Viana, developed by meldCX, can be an X-factor in making data driven decisions.

Retail Bank Industry Challenges

In recent years, banks have been tested for adaptability, innovation, and competition from financial Institutions, changing business models and disruptive technologies. The emergence of non-traditional bank startups, or financial technologies, has forced traditional financial services providers, or banks, to rethink their way of doing business. Customers today expect round-the-clock premier experiences - such as the ease of accessing their accounts from anywhere in the world (digital banking), yet still with the expectations of personalized 1:1 customer service.

The need of the hour is to have a deep learning of customer requirements, preferences and accordingly implement newer ways to provide premium delivery of banking services across both physical and online channels every day.

In the context of the retail banking industry that serves through the physical space to attend customers, the following areas require AI driven technologies to reap maximum benefits:

- **Real Time -** Adoption of real time interactive technology can help banks rebuild or improve their brand equity and in-turn increase chances to acquire better leads.

- **Business Intelligence -** Collecting data that could be valuable while making decisions for better customer experience.

- **Safety & Privacy -** Avoiding security problems while staying in-compliance with banking policies.

- **Contactless Process** - Scaling business despite the pandemic situation and maintaining contactless interaction.

Case Study - AI Vision Analytics Solution to Gather actionable Insights

Below is the case study on how one of the oldest and leading banks of Australia implemented the "Vision Analytics" solution into their digital transformation strategy for improving its retail banking experience.

The bank had invested a lot of time and money in digital signages and advertisement content. However, they had very little visibility on how their digital campaigns were performing in-branch. With more than 1200 branches and huge customer footfall, it was a challenge to determine which screens attracted the maximum viewers. Also, who are viewing the content, and what content is viewed the most.

The bank wanted to track content effectiveness such as which zones attracted the most foot traffic. Also, what visitors were doing in other zones.

To address the needs, the bank implemented Vision Analytics solution - Viana™, developed by meldCX in association with Intel®, to provide detailed insights and reports on various aspects.

Deployment

During the deployment, Viana was set up on key screens in different zones inside the retail branches, strategically placed to cover the field of view of their digital signage screens and record observations. The solution setup tracks anonymous audience based on their mood, movements, and attires to create a unique identity.

Once a person enters its field of view, they are detected and counted. Watchers are counted as soon as their face is detected and facing towards a screen. They are then tracked based on how long they stayed, how long they paid attention, and what they paid attention to. These elements are derived from audience data including demographic profiles (age, gender), mood, attention and dwell times, total likelihood to see (LTS), and more

- Viana tracked glances when people watched for at least 3 seconds.

- It tracked views if the viewers watched at least half the content duration.

- View throughs were recorded when people watched the content from start to finish.
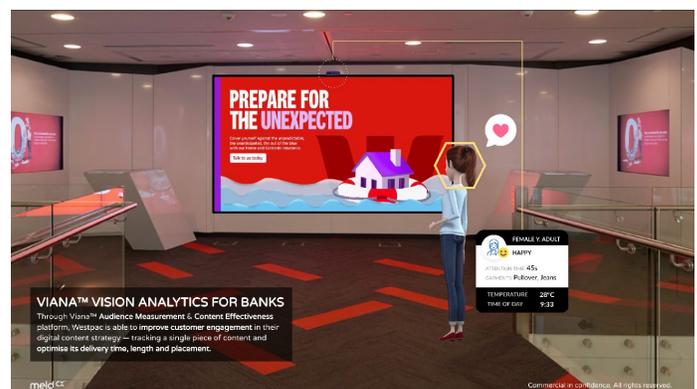

Figure 1 Viana tracking viewers inside the bank branch

At the end of each month, Viana generated insights from the data captured from each sensor and provided a playback report. The report gave insights such as top personas, busiest time of day, content rankings, and content effectiveness ratios. As a result, the bank was able to make data-driven decisions about content spend on digital signage and prioritize cross-channel campaigns based on the findings.

The below screenshot is a sample dashboard of report analysis.

Figure 2 Sample Report Analysis

Implementation Outcome

The solution helped the bank capture huge volumes of data related to human traffic and analysis. This solution helped the bank to gain

- A thorough understanding of customer journeys throughout different bank zones.

- Detailed insights on content, which engages the audience and customer preferences.

- Visibility on ROI.

Based on the data and analysis, the bank can now efficiently plan out effective campaigns that bring in the most conversions. Also, make data-driven decisions about their Digital Signage effectiveness. Now the bank knows what content resonates strongest with which customer personas, allowing their marketing efforts to focus on creating more strategic and effective campaigns - all through Viana by meldCX.

Success Metrics

Combining physical insights gathered through Viana, with data from online channels such as web & mobile, allows the bank to plan omni-channel campaigns that are more targeted, engaging, and relevant for their customers.

- Within 3 months, the bank's marketing team experienced an 87% increase in campaign engagement due to insights gathered from Viana

- Running Viana for 20 months, the marketing team were able to track campaign engagement in-store, even during the pandemic restrictions. Despite COVID-19 lockdowns, they found that banking customers still valued in-branch visits and continued to view content inside their retail branches.

- Through Viana, the bank can combine physical insights with data from online channels, bridging the gap between digital and physical channels.

- With these omni-channel insights, the bank can now make data-driven decisions and efficiently plan out effective campaigns that bring in the most conversions all throughout the customer journey

Viana – Vision Analytics, a meldCX Product on Microsoft Azure and GCP

meldCX is an Australian based technology company specialized in developing solutions for its customers during their Digital transformation journey by implementing IoT and AI technologies. Viana is an AI driven Vision Analytics solution designed by meldCX in association with Intel®.

It features the following components:

- **Single Pane of Glass:** Customer's own portal, which allows access to all sites and cameras, view network performance, and extract insight reports.

- **Actionable Data Stories:** Viana tells descriptive stories about customer business, such as store performance, customer behavior, and visitor activity.

- **Anonymous Video Analytics:** High performance face mapping extracts predefined human data without keeping any identifiable information. Once a person enters its field of view, they are detected and counted based on their behavior.

  o How long they stayed

  o How long they paid attention

  o What they paid attention to

- **Content at Right Opportunity:** Viana's content triggering feature enables integration with content platforms, where "rules" can be set to trigger content on screens based on the attributes of people present within the field of view.

Figure 3 Metrics

Hardware Components

Viana is designed to run on a recommended Intel® NUC edge device, connected to a PoE switch that consolidates data tracked by the sensors.

- **Edge Compute** - Intel® NUC Edge device converts image data to metric or numerical data, and no images from the sensors are transmitted or stored. It ensures that no personal identifiable information (PII) is captured. With Intel® OpenVINO™ technology, this data is then processed and encrypted, ready for transport to the cloud. From the Edge, the encrypted data is then transmitted to Viana's data warehouse, where it is transformed and analyzed.

- **Power Over Ethernet (PoE) Network Switch -** A PoE switch is a network switch that has Power over Ethernet injection built in. When connected with other network devices to the switch as normal, and the switch detects whether they are PoE-compatible and enables power automatically

- **Viana Sensors** - Viana has certified IP cameras of Cisco Meraki, Axis and USB sensors & web cameras company. The cameras can be deployed both indoors and outdoors.
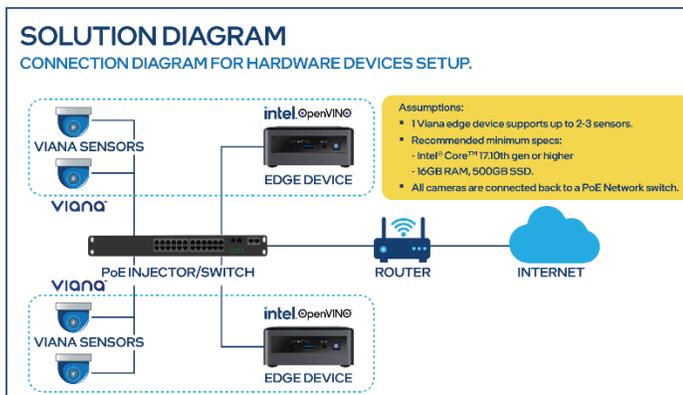
Figure 4 Solution Diagram

Solution Description

Viana is a combined solution of IoT hardware and machine learning at the Edge, with vision AI at its core. Viana's Audience Measurement Engine (AME) consists of interchangeable person/object detection models. Also, the tracking module that is inspired by the methods for people tracking.

- **Vision AI** - The technology can identify and classify people, their individual attributes, emotions, objects. It can also accurately recognize any action and analyze based on the data collection model. Viana captures anonymous audience data through face mapping technology without keeping identifiable information, respecting audience privacy.

- **Consolidate Data** - Collect engagement attributes (i.e., emotion, attention, time span), use it to develop insights and provide reports. In short, with the help of the AI analytic model built, the bank can look at a complete customer view by looking at facts and figures, customer behavior, preferences, and sentiments.

- **Reporting** - At the cloud, Viana uses data visualization feature to provide robust reporting.
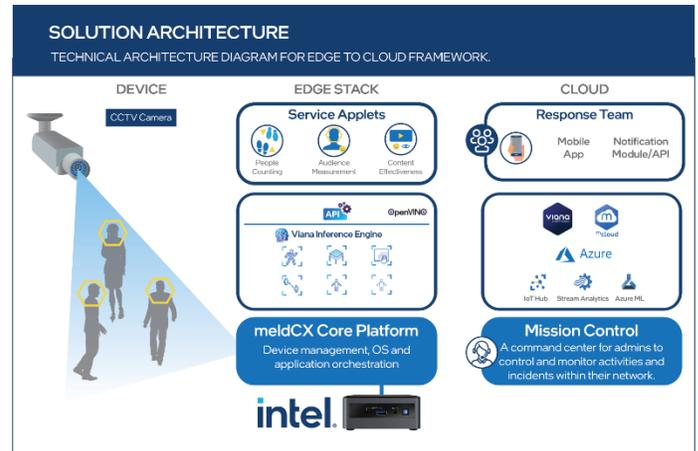
Solution Architecture

Figure 5 Solution Architectures

Intel® Inside the AI Vision Analytics Solution

Viana uses Intel® OpenVINO™ framework to run machine learning models at the Edge. This framework leverages the computing power of Intel® NUC edge devices. Intel also features various technology applications to support partners like meldCX build powerful Digital Solutions

Table 1 highlights technical areas and the associated Intel® technologies that are useful in the development and Deployment of Viana like solutions

Table 1: Key components powered by Intel® Technologies

Area	Technical Consideration	Applicable Intel® Technology
Computing Platform	▪ Intel® processor-based platforms are widely used in the bank branches to run a host of solution such as ATMs, VTMs, Thin Client, Digital Security & Analytics etc.	▪ Intel® MEC Architecture (MECA) ▪ Intel® Smart Edge ▪ Intel® NUC ▪ Intel®-based Industrial PC ▪ Intel® SDM based Digital Signage
AI Modelling	▪ The Intel® Distribution of OpenVINO™ toolkit enables the solution to optimize, tune, and run comprehensive deep learning. based AI inference of vision and audio analytics.	▪ Intel® OpenVINO™ Toolkit ▪ Intel® Open Visual Cloud ▪ Intel® GPU
Device/Data Security	▪ Intel® platform provides hardened full-stack security solution to protect sensitive data/keys at all states of data: at-rest, in-transit, and in-use. ▪ Additionally, Intel® security capabilities provide security protections (confidentiality, integrity, and availability) at all levels of boot phases.	▪ Intel® Integrated Graphics ▪ Intel® Security Essentials Root of Trust Hardware Security ▪ Intel® Software Guard Extensions (SGX) ▪ Intel® Secure Key ▪ Intel® Control-Flow Enforcement Technology (CET) ▪ Intel® Threat Detection Technology (TDT)

Area	Technical Consideration	Applicable Intel® Technology
		▪ Intel® AES-NI ▪ Intel® SHA-NI
Biometrics Authentication	▪ Intel® RealSense™ combines purpose-built hardware and software with a dedicated neural network designed to deliver a secure facial authentication platform that users can trust.	▪ Intel® RealSense™ ID
Touchless Technology	▪ Touchless solutions are essential for a world adapting to new normal	▪ Intel® RealSense™ ▪ Intel® OpenVINO™

Summary

Vision AI powered analytics is a next gen reporting solution where automation and contactless technologies plays an important role in a Digital transformation journey. Data-driven decisions provide better customer experience, improve content effectiveness to attract more customers and visibility on ROI, which will draw success stories for banking institutions.

About Intel®

You may know us for our processors, but we do a lot more! Intel® invents at the boundaries of technology to make amazing experiences possible for business and society, and for every person on earth. By harnessing the capability of Cloud, the ubiquity of Internet of Things, our rich portfolio of AI technologies, and the promise of always-on connectivity.

Recommended Intel® Compute Platforms

- Intel® NUC
- Intel® OpenVINO™
- Third-party compute platforms based on Intel® Core™ processors

intel.

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