

India Connected

APIs for a billion lives

An analysis of the IMC2025
Open Gateway hackathon by

TELCO **f**
ORGE

on behalf of

GSMA
Open Gateway

Contents

Background	3.
Setup	4.
Nokia Network-as-Code APIs	5.
401 Contenders	6.
The Live Finals	10.
The Final 10	12.
The Winners' Experience	16.
The Developers' Suggestions	18.
Conclusions	19.



Background

Since 2023 the GSMA has been working with the Linux Foundation's CAMARA project to create and publish network APIs, opening up the capabilities of the telecoms network to service and application developers in a unified way.

Since then almost 40 mature APIs have been published, enabling access to capabilities in devices, networks, identity, location, billing and payment, and much more. Nearly the same quantity are in development.

While this is great progress in just a couple of years, it means little without developers being aware of the APIs or engaging with them.

To that end, in October 2025 the GSMA organised a hackathon during the India Mobile Congress in New Delhi, partnering with Hackerearth for operational support, Indian telcos engaging as judges and Nokia for their API platform.

The two-day event aimed to spread awareness of the CAMARA APIs and encourage uptake and usage within India's vibrant developer ecosystem.

Over the following pages we will tell the story of what happened; the innovations developers are capable of when armed with CAMARA APIs; the three teams who ended up winning; and the lessons we can all take away.

The Response

2347

Registrants

1820

Teams

5

Judges

Rules

You may work on your hack in the allotted time and place only.

You must submit a hack that fits one of five themes.

Once the hackathon starts, you can submit as many times as you want, the last hack will be considered as the final submission.

Any idea copied from somewhere will be disqualified.

You may use open source libraries and other freely available systems/services.

The intellectual property of your code belongs only to your team.

Process

Online Idea Phase

An initial filter sorted out teams which don't fit the brief or are unable to attend the hackathon.

A second filter created a shortlist of teams for invitation to the hackathon onsite at India Mobile Congress.

Onsite Prototype Phase

The physical hackathon ran from 8-11 October 2025.

10 finalist teams presented to a panel of judges, who selected three prizewinners.

Themes

Financial Inclusion & Fraud Prevention

Enable secure onboarding and fraud detection for fintech platforms and rural banks.

Healthcare Access & Emergency Services

Connect patients to care, enable remote diagnostics, and support first responders.

Agritech & Rural Connectivity

Support farmers with weather alerts, crop insights, and supply chain visibility.

Education & Digital Inclusion

Deliver personalised, secure, and scalable learning experiences.

Open Innovation

Build novel solutions that push the boundaries

Evaluation

Criteria: Online Idea Phase

1. Does the solution answer the problem the candidate proposes?
2. Impact of the solution to users
3. How applicable is the solution to Network as code?
4. Novelty of the solution
5. Use of the the Nokia Network as a code platform's APIs
6. Did the team use several different APIs in their solution?

Criteria: Onsite Prototype Phase

1. Originality and creativity of the solution
2. Potential to solve real-world problems in India
3. Use of Open Gateway APIs and integration quality
4. Potential for commercial deployment
5. Clarity and persuasiveness of the pitch

Nokia Network-as-Code APIs

The hackathon had the option of using a variety of different platforms for APIs. However, the GSMA selected Nokia's Network-as-Code platform to host the APIs used by the teams.

"We used the Nokia platform as a sandbox," Paul explained.

"Services didn't go over the live network. But we pointed out that this is not a development platform, it's not a hackathon platform, it's the live environment. So what the teams built could be implemented as-is, which was an important selling point."

The use of specific APIs placed a degree of restriction on the teams, but also served as a gentle introduction to the diversity of capabilities in the CAMARA APIs. By encouraging a focus on a relatively few stable and well-established APIs the developers were able to gain a good initial experience.

Moreover, Nokia provided experts on the ground at IMC to assist the teams further.

It is worth noting that, in addition to standard CAMARA APIs, Nokia included three which they offer separately on their Network As Code platform, relating to network slicing.

While all APIs found interest among the teams competing, the standard CAMARA APIs got considerably more use. This may reflect the level of familiarity (or otherwise) that teams had with telecoms. While the uses of a service like number verification might be immediately obvious to an external observer, network slicing is perhaps less so.

4 groups of APIs used

Digital identity & Anti Fraud

- Number verification
- SIM Swap
- Device Swap
- Location verification

Network Intelligence

- Congestion insights

Programmable connectivity

- Quality on Demand
- Network slice management
- Network slice application attachment
- Network slice device attachment

Device Intelligence

- Location retrieval
- Geofencing subscriptions
- Device reachability status
- Device roaming status

401 Contenders

After the first round of eliminations, 401 teams remained. This number represented 401 different and unique proposals for services which could solve real problems in India.

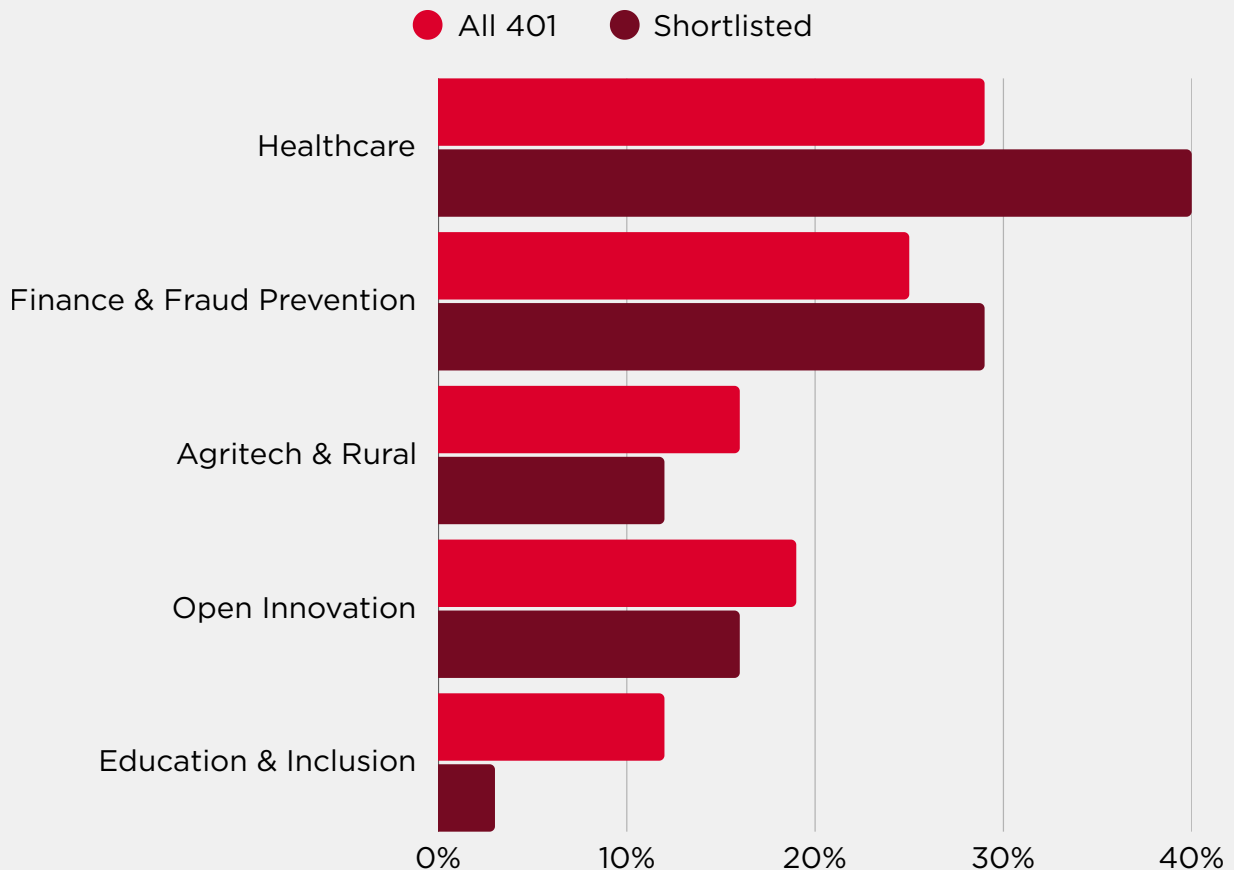
“I didn’t expect the kind of responses we got,” GSMA’s Justin Paul.

“While we set out five themes, my expectation was people would go for the Open Innovation one because it was flexible, very much carte blanche. Actually a lot of them were focused on the four discrete themes that looked at specific challenges.”

The vast majority of participants were teams from student backgrounds, many of whom will be graduating between 2026 and 2028. There was a leavening of experienced teams, with some people having up to 15 years’ experience in their field. However, the average amount of employment experience added up to less than one year.

As a result, we should look at these proposals typically as seen through the lens of creative people who have been able to identify problems and opportunities in their environment, but who may not have much commercial experience within an industry.

Applications by theme



Healthcare

Topics pertaining to healthcare were the most represented throughout the competition, with 117 proposals submitted. This reflected a variety of challenges in accessing healthcare options faced by people in a country as diverse as India. Solutions tackled everything from affordability and language barriers to supporting remote diagnostics and bringing emergency services to the correct locations.

The most commonly-employed APIs were Location Verification (to find people in trouble); Device Reachability Status (to support remote monitoring capabilities or engagement with the end-user); and Quality-on-Demand (typically to ensure services at critical moments).

However, the services and applications varied widely in their complexity. Beyond telecoms integration, services employed everything from QR codes to check medication; AI-supported IVR to identify early markers of illness in a user's voice; connections into ambulance services; even geographic and satellite sensing to cross-reference natural disasters against users' location.



Finance & Fraud Prevention

Entries under the Finance and Fraud Prevention theme (99 submissions) were also diverse and reflect some key areas where people face challenges.

The use of both smartphones and feature phones to conduct transactions, microloans and more have seen challenges with frauds including SIM swap.

People also addressed pain points such as difficulties with the banking system during internal migrations between states or accessing financial applications through feature phones.

Protection from fraud more broadly also produced some innovative ideas for the local context, such as validating educational certificates; creating AI-powered trust metrics for online content and services; QR-based counterfeit food detection; personal data protections; and electricity theft detection.

By far the most commonly-used APIs for this theme were SIM Swap, Number Verification and Location Verification as methods to overcome different types of fraud, both committed by and upon consumers.

Notably, many of these proposals also suggested they use of APIs not made available through the Nokia platform. For example KYC Match, which is a robust CAMARA API today; and Scam Signal, which is only available to telecoms providers owing to the possibility of reverse-engineering the code to strengthen hacking attempts were it publicly available.

Agritech and Rural Connectivity

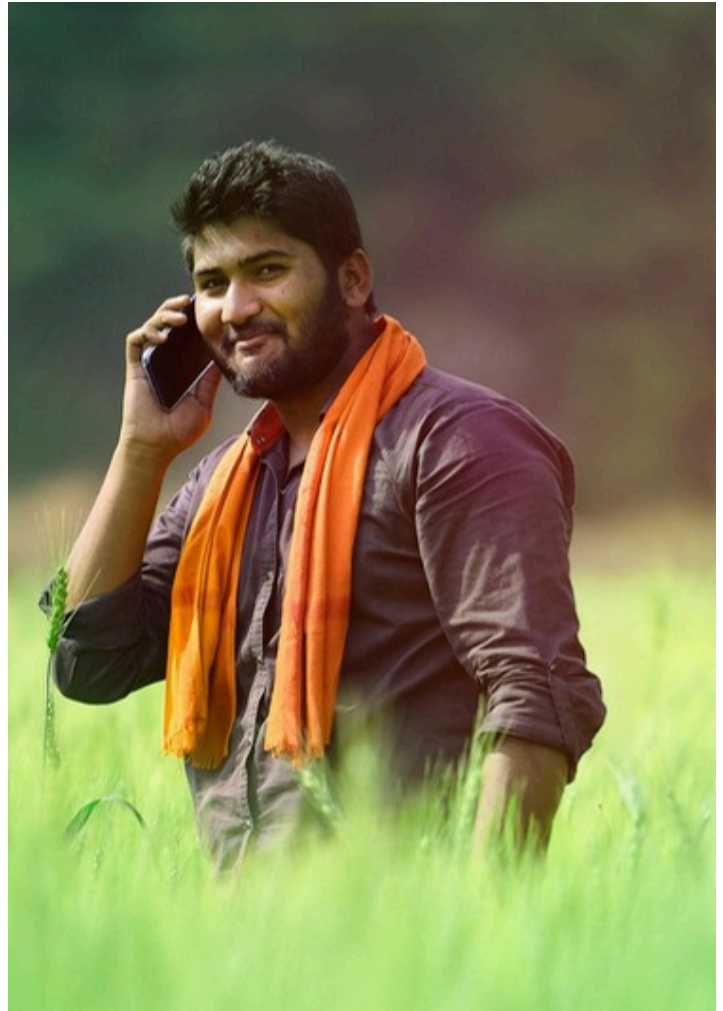
For the Agritech and Rural Connectivity theme (63 entries), the focus was on identifying locations through Location Verification and Geofencing, while Connectivity Insights and Quality on Demand were popular to support connections even in more isolated areas.

While there was a strong range of ideas, many participants gravitated towards playing to the strength of the phone not only to make calls but to take photographs.

Several proposals were to simplify insurance claims for crops against weather damage, by enabling geotagged photographs of damage to go to insurers correlated against local weather reports.

On other occasions, AI was used to identify crop pests and diseases from photographs, supporting timely treatment at best and tracking/predicting the spread of diseases at worst.

As agriculture still supports around 45% of India's workforce, applications such as these could have a significant impact.



One That Got Away: Project Kisan

There were many interesting suggestions which, for one reason or another, did not make it through to the live final. This is just one example.

Project Kisan aims to empower small and marginal farmers in rural India with a digital platform that delivers timely weather alerts, market price intelligence, and logistics support while adapting to low-connectivity environments.

By integrating telecom APIs (Location, Geofencing, Device Identity) with agri-data sources, the platform reduces risks, improves market access, and enhances trust in agricultural inputs.

Meanwhile, using the Connectivity Insights API helps the service determine how best to connect to other forms of data.

Education & Digital Inclusion

Proposals within the Education and Digital Inclusion theme were highly diverse, albeit fewest in number (47 proposals).

Proposals covered everything from keeping track of school buses and automating attendance to scholarship finders and offline AI education assistants. Scratching below the surface, however, there are some very clear concerns driving a wide array of solutions.

Firstly, many of the solutions aimed to address uneven access to good-quality education, supporting people who may be missing qualified local teachers or who need additional learning resources over and above what's available in the classroom.

Others aimed to improve uneven access to digital resources or connectivity, for example by offering local content caching or offline-first services which then sync to the cloud when it's possible to do so. One notable proposal floated the idea of 5G base stations mounted on drones.

Unsurprisingly, these concerns led to a clear trend in API usage, with a focus on Congestion Insights and Quality on Demand. Because of the focus on applications relevant to the experience in schools, there was also interest in Geofencing or Location Verification APIs.

Again, most proposals used APIs to facilitate their services but integrated a wide variety of capabilities beyond telecoms; everything from payment gateways to natural language processing, facial recognition and mesh networking.

Open Innovation

Finally, but not least, the Open Innovation category (75 proposals) brought in a smorgasbord of different topic areas.

Proposals included a service to improve train carriage cleanliness; a way to translate legal jargon for non-professionals; border security monitoring; network quality mapping; improving gym posture; and crowdsourcing information on seagoing hazards.

There were several applications which reflected a concern with personal safety, however. There was worry that victims of crime or assault may have little recourse, which prompted several variations on a theme of having the handset record and/or send an SOS signal 'invisibly' - one in the hope of assistance, the other to ensure that there is some kind of evidence of the attack and, hopefully, restitution.

Unsurprisingly any trends in API usage were far weaker in this category than others. Many services had some element of location awareness or identity verification underlying the main thrust of their service.



The Live Finals

From the many proposals, 58 teams were shortlisted to join the final hackathon live at India Mobile Congress. Some teams proved unable to attend, and 47 teams, consisting of almost 150 people, attended onsite.

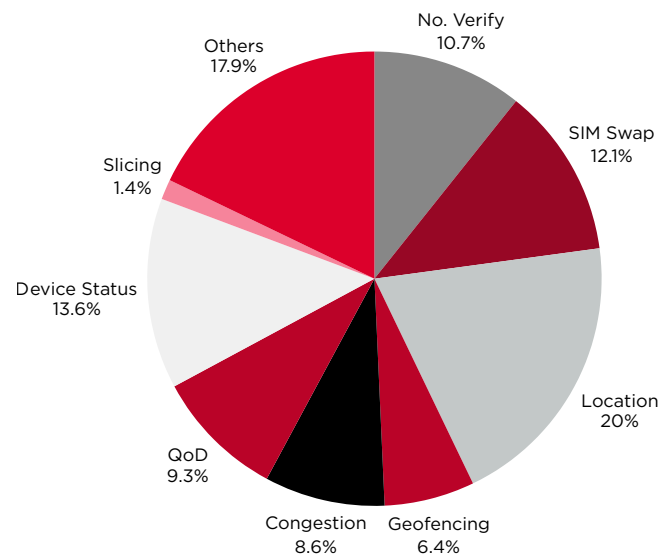
While the majority of these finalist teams were students from across India, there were 11 teams which were not solely students, or which were supported in their attendance by organisations. One team came from the National Informatics Centre; two were companies who might be expected to have some familiarity with telecoms, Dell and EPAM Systems; while the others were from a wide range of other industries and specialist app developers such as Bluink Labs, Appfoster Innovations and IndiaMART.

Over two days the teams were tasked with not just turning their ideas into workable MVPs, but also preparing to present them to a panel of judges from the three Indian mobile telecoms providers, Nokia and API specialist Ipification.

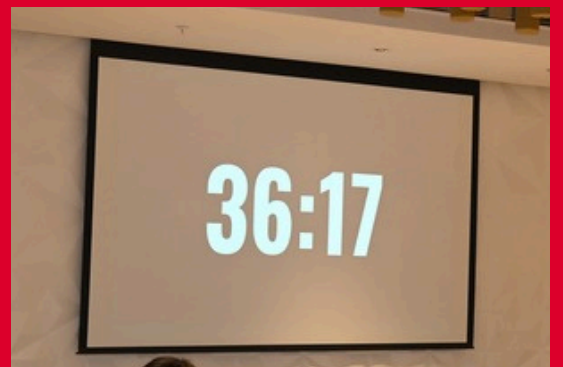
A team of hackathon mentors and API experts, principally from Nokia, were on hand to provide support and watch over progress on the hackathon floor. On the final afternoon they selected ten of the most finished and most promising teams to present a pitch to the judges, who then had the hard task of choosing a winner and two runners-up.

“We overran by a long way,” GSMA’s Justin Paul commented. “These were quite senior people in the telcos doing the judging, but they were really engaged. The winning team got some really hard questions, detailed questions, pushing them. I think they were a bit taken aback by that. I had to explain ‘They’re asking you these questions because what you’ve presented is really interesting. They’re trying to work out how they would implement it.’”

APIs employed



“They’re asking you these questions because what you’ve presented is really interesting. They’re trying to work out how they would implement it.”



The Final 10

Towards the end of the hackathon, ten teams were selected to take part in the final presentations to the judges. The winning three teams are addressed later, but the remaining seven show just how diverse the innovations were.

Service	What it does
Smart Tourist Safety App	A comprehensive travel safety system that provides real-time monitoring, emergency alerts, geofencing, and administrative control by relevant authorities.
Trust Score as a Service	AI-powered fraud detection verifies user identity; if the phone is genuinely yours; and builds a digital profile of each user's normal transaction behaviour.
SecureGate	Rural banking application featuring secure onboarding; mobile security; a fraud risk engine; and scam detection engine.
RakshaGrid	An emergency response network that automatically builds a graph of users' close relatives and emergency contacts, ensuring that vulnerable populations receive critical assistance.
FarmSmart	A holistic solution offers AI-driven crop insights and automated insurance claims, real-time supply chain tracking, and adaptive network management for remote farming areas.
ResQNet	AI-powered crash detection with real-time ambulance tracking using QoS on Demand Pro to ensure seamless, prioritised communication during emergencies via a backend-orchestrated group session.
FinSecure	FinSecure is built to safeguard India's Tier-2 and Tier-3 banking networks, digital payment platforms, and loan institutions, offering an AI-driven, telecom-backed security layer for the future of digital trust.

3rd Prize: **Silent SOS Mesh**

The critical first hour after an emergency determines survival, but two points of failure steal precious time:

Human Failure: An unconscious, incapacitated, or distressed person cannot call for help or operate a panic button.

Network Failure: In disasters or remote areas, cellular networks fail due to congestion, physical damage, or complete lack of coverage. Standard SOS calls have no guarantee of delivery.

Solution: In Their Own Words

01

Intelligent Wearable

A low-power device automatically detects life-threatening events—falls, critical vital signs—using on-board sensors and Edge AI. Zero human interaction required.

02

Resilient Mesh Network

Without cell signal, the device broadcasts a secure SOS packet over a decentralized LoRa mesh network, hopping device-to-device until connection is established.

03

Guaranteed Delivery

Once a gateway is reached, Nokia's Network as Code APIs command the network, guaranteeing the alert is delivered with highest priority.

Wow Moment

Producing not just an app for their pitch but also a working IoT device for monitoring vital signs and fall detection. A live demo showed how alerts would be delivered to an emergency services monitoring platform.

API Usage

Quality on Demand

API requests a "Mission Critical" session for the device, instructing the network to prioritise the SOS data above all other traffic.

Location retrieval

API fetches the device's last known coordinates to enable accurate emergency response when GPS is unusable.

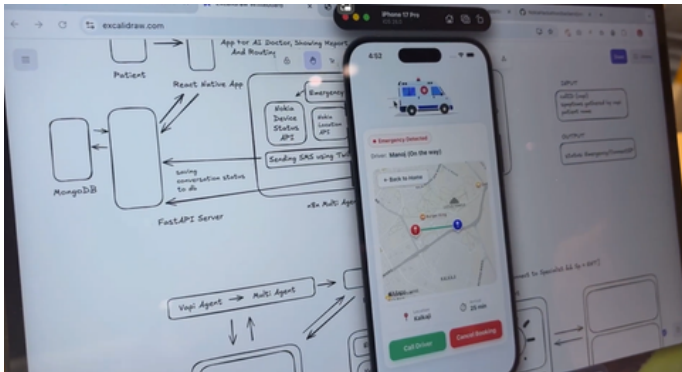
The Team: Zipcodebreakers

Five students from colleges in Pune, Maharashtra, banded together to deliver this exceptionally easy-to-use service. Watch out when they graduate in 2028!

Using mesh networking to compensate for coverage gaps and broadcasting vital signs as well as an alert show a good understanding of the problems faced by first responders as well as technical innovation.

2nd Prize: **Rakshak AI**

Many villages face long travel distances, a shortage of doctors, and slow emergency responses. Rakshak AI's goal is to connect patients with the right doctor quickly, even in places with poor network coverage.



[Watch the team explain the process](#)

The Solution

AI Assistant: Patients press one button to connect with a medical AI, who listens to symptoms, prepares a short health report, and decides which specialist is needed.

Smart Doctor Routing: AI routes the patient to the correct specialist and provides the doctor with a summary of symptoms and predicted diagnosis.

Emergency Handling: If the AI detects a critical case, it alerts the doctor, books the nearest ambulance, and shares the patient's location automatically.

Adaptive Communication: The app switches between text, voice, or video depending on network strength to ensure the consultation won't drop.

Data-Saving Video: Only important video frames are sent, saving bandwidth for low-data areas.

Wow Moment

Watching a smart, AI-powered service adapt to difficult network conditions without dropping. This is the kind of reliability that could make beloved apps stand out from the crowd.

API Usage

Location retrieval

API fetches the device's last known coordinates to enable accurate emergency response.

Device Status

API keep track in case the user's phone is switched off or runs out of battery during the service.

The Team: Malaai

Four locals from New Delhi's Guru Gobind Singh Indraprastha University ran away with the 300,000-Rupee second prize. Three final-year students were augmented by one recent graduate.

The team's focus on simplicity, local support and reliability in uncertain conditions made this a compelling use case. It offers triage for medical services and improves access to advice for customers.

1st Prize: PinPoint

PinPoint bridges telecom intelligence, geolocation data, and AI to enable contextual marketing and real-time discovery — redefining how small businesses connect with nearby customers.

The Solution

AI-Powered Campaign Creation: Custom AI-driven poster generation and campaign management reduce marketing effort by up to 80%, allowing non-technical small and medium businesses to launch high-impact local promotions effortlessly.

Real-Time Geo-Engagement: Customers receive instant push notifications about nearby offers as they enter an active zone.

AI Local Concierge (Google Gemini API): The built-in AI assistant understands natural language queries like “I have ₹300 for lunch nearby.” It analyzes the prompt and recommends shops that match the user’s budget and category, ranked by proximity and relevance.

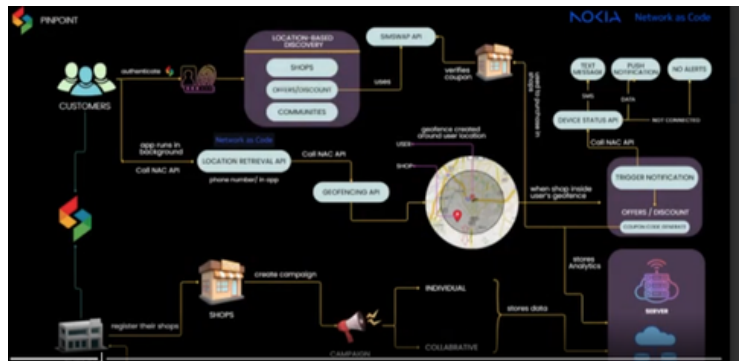
Wow Moment

The team explains their “user-based geofencing” concept.

Traditional geofencing creates boundaries around each shop, causing exponential complexity as adoption grows. e.g. 100 shops × 100 users = 10,000 geofence checks.

With PinPoint each user maintains a single geofence around their live location. As the user moves, the system detects all shops advertising on PinPoint within that radius.

“Complexity reduces to $O(N)$ instead of $O(N^2)$, making it much faster, lighter, and more scalable.”



Demonstration video for PinPoint

API Usage

Geofencing

API creates dynamic virtual boundaries around users, triggering promotions locally as the user moves..

Device Verification

API prevents fraudulent or duplicate participation in campaigns

Location retrieval

API enables accurate location tracking for proximity-based services.

Device Reachability

API sends offers via push notifications when on data or via SMS if not.

The Winners' Experience

A conversation with winning team PinPoint

When the GSMA launched a hackathon at India Mobile Congress, for four students from Chennai it was an opportunity to do what they love. "We like to participate in hackathons, like bring up innovative solutions," one team member explained. The experience Rohit, Divakar, Rithik Raja, and Kaviyarasu had on the way to victory offers invaluable lessons, both for future developers and event organisers.

A Leap into the Unknown

Despite being seasoned participants who had already won previous events they found through the HackerEarth platform, the core technology of this event was a complete unknown.

"We weren't aware of CAMARA APIs before," Rohit admitted. "What we were aware of earlier is that police would use the telecoms network to find the location of criminals using their mobile number. That's all we were aware of earlier". However, the technology and the idea impressed. "It was really fascinating that Nokia had provided us with APIs where we could bring up innovative solutions for business use cases," he added. "It is really cool".

This fresh fascination led to a "completely new" idea for the hackathon. The team decided to tackle hyperlocal marketing, an area they had thought about before but were able to approach in a whole new way. Their concept: PinPoint, an application enabling shopkeepers to create promotions to nearby customers.

"Rithik Raja was the one who thought about using these network APIs to push offers to users who come into the geolocation near the shop," Rohit explained.

PinPointing Pain Points

Rithik Raja picked up the thread, explaining how this adds value to small businesses. "If they can't create promotions, if they don't have that much time, the AI comes into play. They only provide the basic info and the AI will automatically generate the promotion". When consumers pass nearby, the promotion would be delivered as a pop-up, or else they can search the application with an 'AI concierge' to find what they're looking for.

The team's own experience validated the idea, Rohit explained. "Since Delhi was a new place for us, when we walked out of airport, we couldn't find nearby hotels which we could afford... If we had this application in place... it would have sent offers and notification about the hotels nearby".



Building a functional prototype in two days is a huge amount of work, but the team had a proven system. The key, they revealed, wasn't frantic coding, but prior preparation and parallel work.

"We had ideated priorly," Rithik Raja said. "Brainstorming was done, all features had been described properly so that it was easy for us to build the entire end-to-end product in that two days".

Divankar explained their parallel working strategy. "Rohit built a back-end site, Rithik did mobile UI development, Kaviyarasu dealt with the AI workflow and I did system architecture and the integration work". This division, planned in advance, was their secret to effective delivery.

Their biggest technical hurdle—using the new APIs—turned out to be a pleasant surprise. Mentors introduced the APIs, which the team found "more user-friendly" than expected. They were "highly abstract," which was a major benefit.

"For example... we had to just pass the mobile number to the endpoint, then an endpoint will automatically give the latitude and longitude of the user," Rohit explained. "It helped us focus more on the business project".

Last To First

Rohit explained how nerve-wracking the final presentation was.

"We were the last team to be qualified... the 10th team to present," he said. "It created a kind of panic situation among us. What if the jury became a little tired by our turn?"

But their fears were unfounded. The judges "were very much interested in understanding our solution, and they were keen on asking follow-up questions" - which ultimately led to the team walking away with the 500,000 INR top prize.

That interest extended beyond the judging. The team "had a chance to meet many people" from telecoms providers Airtel and Jio, as well as the Nokia mentors. Indeed, they connected with Nokia staff on LinkedIn for future work opportunities.

Will they take that opportunity, though? It's not clear at all, as the team is looking to turn their hackathon project into a real-world product. "We are considering to make it into a business, and we are planning to launch it as an app also".

It's a great story and a well-deserved triumph, but the team was full of advice for would-be hackathon entrants and organisers too.



The Developers' Suggestions

To Participants

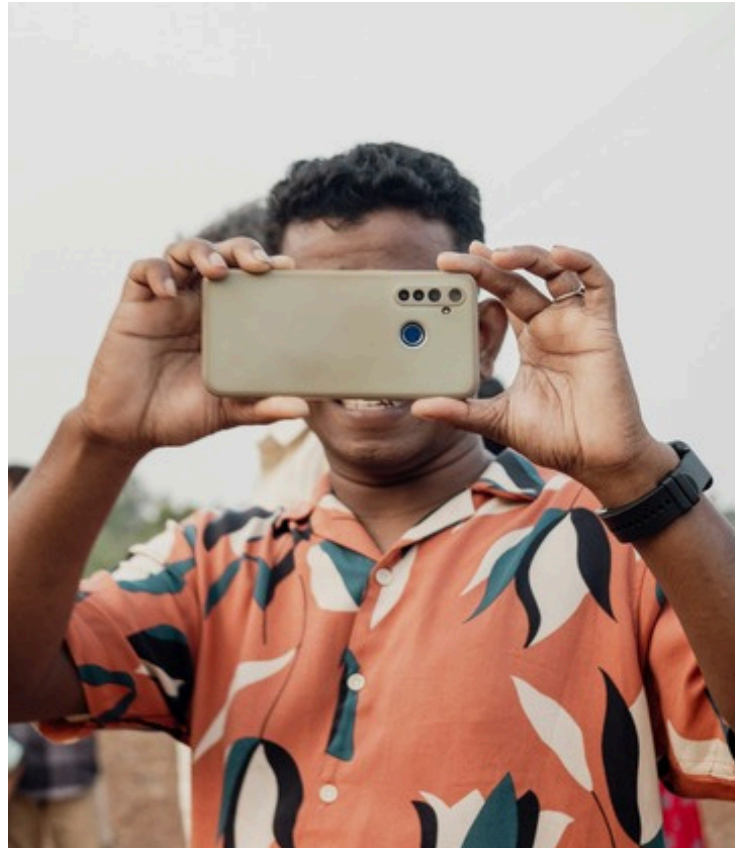
“Just show up and start. Most people hesitate because they think hackathons are only for experts... but the truth is even first year or second year students can achieve something”

“Teamwork is everything. A team of four or five will be fine, if they can communicate and they can divide their responsibilities”

“Treat it as a learning experience, not a competition. A hackathon is the safest place to experiment, break things, learn fast and build something new”

“A perfect pitch... is important for winning”. Their pro-tip: Take a video recording of your demo and *play it back at twice the speed*. That way you can set the scene effectively with slides and then show the demo in the most efficient way possible.

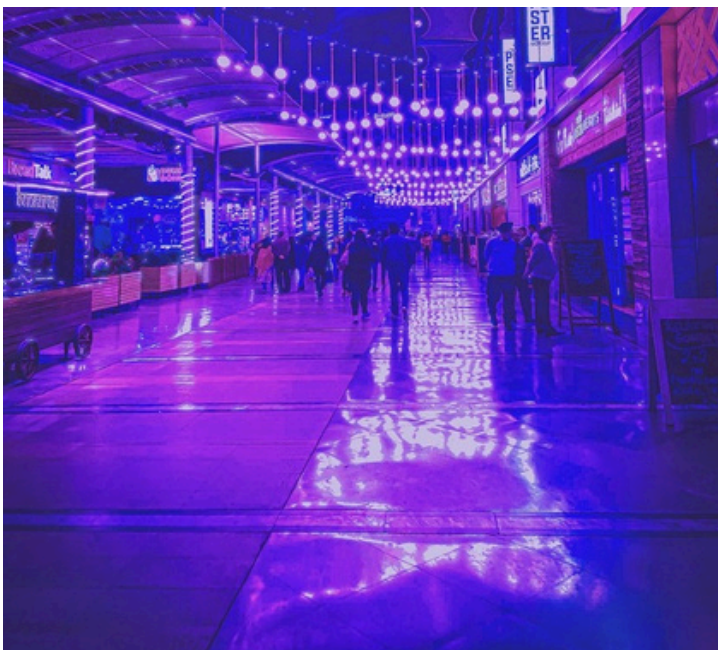
“Even if you don't win, you'll walk away with a new experience, new skills, new connections, and **sometimes with new opportunities as well**”



To the Organisers

While praising the event for being “really well organised”, the team offered two key suggestions.

- **Consider overnight hackathons:** “One small suggestion would be organising hackathons that are twenty-four hours or thirty-six hours continuously,” Divakar noted. “It will help more people provide live applications.”
- As a team that travelled from Chennai, finding a hotel was a significant hurdle. “If the **accommodation** is provided, it is much more affordable for us as well... Next time it could be better if you guys implemented the accommodation”.



Conclusions

The GSMA's hackathon at India Mobile Congress offered valuable lessons for the telecoms industry.

1. Awareness is key.

A host of talented developers are out there prepared to experiment with and integrate CAMARA APIs when they know about them. Outreach is the only essential.

2. There are real problems to solve.

Telecoms APIs offer unique functionality which works well to address very significant challenges in major markets.

3. Telecoms is one part of the whole solution.

Developers can create rich functionality drawing on CAMARA APIs as part of a complex solution alongside AI, other API calls, data management and more... but not as all of it.

4. Developers create opportunity.

Far from being a frivolous exercise, the hackathon created applications which seriously engaged telecoms providers' interest and which can generate new service opportunities.

For more information contact

Justin Paul
jpaul@gsma.com

GSMA
Open Gateway

Report authored by

Alex Lawrence
alex.lawrence@telcoforge.com

TELCO
F
ORGE

