



Big Data for Social Good

Case Study

Utilising Real-Time Mobile Analytics to Aid in the Rescue of Missing Persons



The GSMA represents the interests of mobile operators worldwide, uniting more than 750 operators with almost 400 companies in the broader mobile ecosystem, including handset and device makers, software companies, equipment providers and internet companies, as well as organisations in adjacent industry sectors.

The Big Data for Social Good Initiative convenes public and private organisations to accelerate the mobile industry's impact against the UN SDGs. Infectious diseases, pollution, earthquakes, floods and other disasters are among the greatest challenges the world

faces today. Mobile operators can provide powerful and unique insights to help solve these complex problems, while protecting and respecting privacy. Mobile Big Data can help support emergency relief agencies and organisations to more accurately and efficiently direct their resources in times of crises.

Through the GSMA, mobile operators and partners across geographies have come together to accelerate and scale the opportunity for Big Data for Social Good. The GSMA offers a unique platform to establish a common framework and best practice approaches.

Summary

When a person goes missing, speedy action is essential to ensure their safe recovery. By working with the non-profit volunteer organisation LizaAlert, mobile operator MegaFon is offering a smart solution to quickly alert and activate individuals ready to assist active search-and-rescue efforts in Russia. MegaFon has developed an algorithm that harnesses its network data to contact those of its 80 million mobile subscribers most likely to have information relevant to the missing person without revealing any customer's personal information.





The Need for Enhanced Search-and-Rescue Efforts in Russia

In Russia, 70,000 to 100,000 individuals go missing each year. According to the Agency of Strategic Initiatives, half of the missing people are children.¹ Many other vulnerable populations are also at risk, such as the elderly or adults with disabilities.

Of those that go missing, each year 20,000 to 25,000 are never found. To decrease this number, timely action is essential. When searches for missing persons begin within 24 hours of their disappearance, there is a 90 per cent probability that they will be found. Delayed reaction costs lives.

LizaAlert, a search-and-rescue volunteer organisation in Russia, was launched almost eight years ago to reduce delayed responses in missing person searches. The organisation was launched following a tragic incident. In September 2010, four year-old Liza and her aunt went missing in a forest. A formal search for the two did not begin until they had been missing for five days. Liza died of hypothermia nine days after going missing.

On the tenth day, her body was found. In response to this tragedy LizaAlert launched a rapid response and civil assistance organisation that, since 2010, has coordinated hundreds of volunteers in the search for missing people.²

To date, LizaAlert has been a success; in 2018, LizaAlert received 13,996 applications for assistance with missing persons. Of those, 79 per cent were found alive. To make search-and-rescue efforts even more impactful, volunteers need to be alerted of the missing person as soon as possible so that they can act when the likelihood of recovery is the highest.

In part inspired by other operator capabilities showcased via the BD4SG Initiative, MegaFon set out to design a comprehensive framework that could help address the challenge of missing persons and, in the future, potentially tackle additional use cases such as disaster scenarios like extreme weather.

1. Agency of Strategic Initiatives Director General Svetlana Chupseva shared this statistic in July 2018. http://www.xinhuanet.com/english/2018-07/10/c_137315095.htm
2. <https://lizaalert.org/o-nas/>

How Mobile Data Can Help

When an individual is reported missing, quickly gathering information to guide search-and-rescue efforts is essential. To aid in this effort, MegaFon utilises a specifically-developed algorithm and mobile big data analytics to rapidly alert a pool of potential witnesses via SMS/MMS, inviting them to share crucial information with LizaAlert, all while protecting the MegaFon customers' privacy and personal information.

For each case, upon the search-and-rescue organisation LizaAlert receiving a request for support in a missing person search-and-rescue effort from the police, one

of two authorised LizaAlert staff submits relevant information obtained from relatives of the missing person. The information is submitted via a MegaFon designed web portal, accessed using a unique user ID login and password combination, and 2-factor authentication that verifies the LizaAlert user via a MegaFon provided handset. Information submitted about the missing person may include a photograph, name, age, gender, description of clothing and location last seen. Each time the platform receives a new entry of a missing person, MegaFon's proprietary algorithm is triggered.

The algorithm identifies MegaFon customers who were, or frequently are, in the same location where the missing person was reported last seen as potential witnesses. In addition, if the missing person is a MegaFon customer, the algorithm can assess the missing person's recently contacted numbers and frequent locations at a base station level, to add them to the alerted group. The list of customers identified as potential witnesses by the algorithm are then automatically notified by SMS/MMS regarding the missing person. The automatically distributed alert provides details to the recipients and invites them to voluntarily share information via telephone or anonymous online form, with no intervention or visibility by MegaFon employees or third parties such as the police.

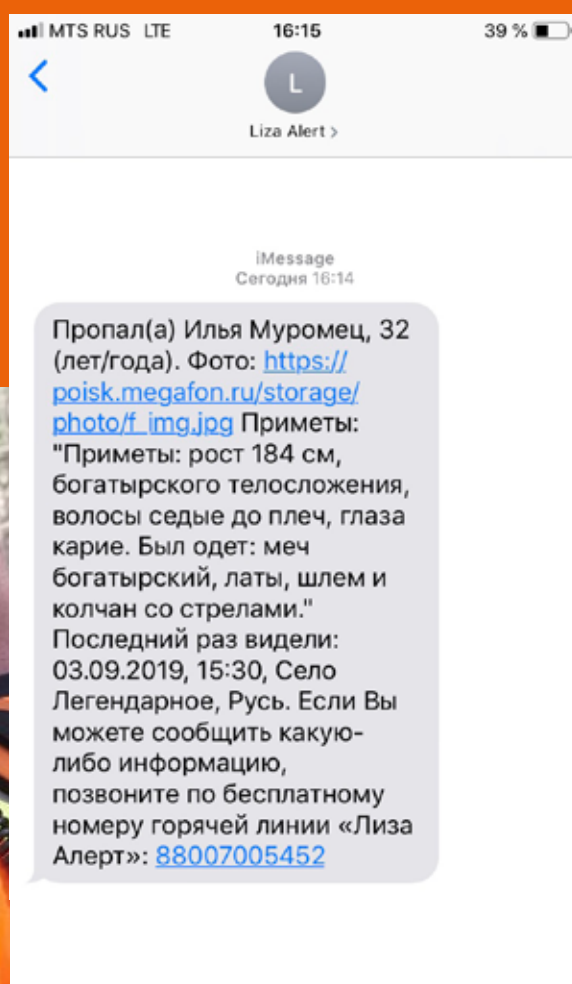
Privacy by Design

After the alert has been sent, the record of potential witnesses is automatically deleted, and at no point do MegaFon or any third party have access to or visibility of the customers alerted. Only MegaFon customers who have permitted MegaFon to send notifications to their devices will receive the alerts, and customers have the right to opt out at any time. The only output detail recorded and shared is the aggregate number of potential witnesses who have received the SMS alert, and this number is shared with LizaAlert.

Results and Impact

On average, it takes the algorithm just two minutes to generate a list of potential witnesses, enabling a rapid response that is vital to achieve success in the search for missing persons. The average number of MegaFon customers alerted is approximately 2,000, with instances of the algorithm alerting up to 3,600 potential witnesses.

In the first 6 months post launch, MegaFon's algorithm was used for more than 250 searches in 38 regions of Russia and resulted in valuable information to aid the search and rescue efforts on a number of occasions. Indeed, Liza Alert reports that in one third of searches where alerts were sent using the newly developed capability, they received at least 1 call with useful information regarding the missing person.



Map of the regions in Russia where MegaFon is currently supporting LizaAlert's efforts



Key Lessons Learned

Through a formal legal agreement with LizaAlert, MegaFon was able to develop a thorough understanding of the challenges of aiding the search for missing persons, identify how mobile data could play a complementary role in enhancing existing efforts, and design a tool that could be incorporated into LizaAlert's existing processes and protocols.

Substantial time and expertise were required to develop the algorithm and smart solution to aid search-and-rescue efforts, including developing new processes to implement big data tools. Development of this solution required a number of steps including initial testing, database architecture design, system provisioning and testing, algorithm design and testing, as well as service and interface design before being able to deliver the new capability for exclusive use by LizaAlert.

Both MegaFon & LizaAlert take very seriously their responsibility to protect the privacy of their users. This is reflected by the creation of access controls for LizaAlert staff, the automated algorithm and closed system to send the alerts, and the requirement that alerts are only sent to customers who have agreed to receive them. These steps ensure user data is shielded from both MegaFon employees and third parties, and also allows users to opt out of the service at any time.

Next Steps

Throughout the process, MegaFon has sought to optimize existing search-and-rescue efforts by activating essential witnesses while safeguarding customers' data. This approach will aid MegaFon as the company considers expanding the platform to respond to a large number of complex problems, such as extreme weather scenarios and crises caused by climate change.



GSMA Big Data for Social Good website
gsma.com/betterfuture/bd4sg

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