



HOME QUARANTINE SYSTEM

Home quarantine monitoring application with face recognition technology and location verification by Asura Technologies

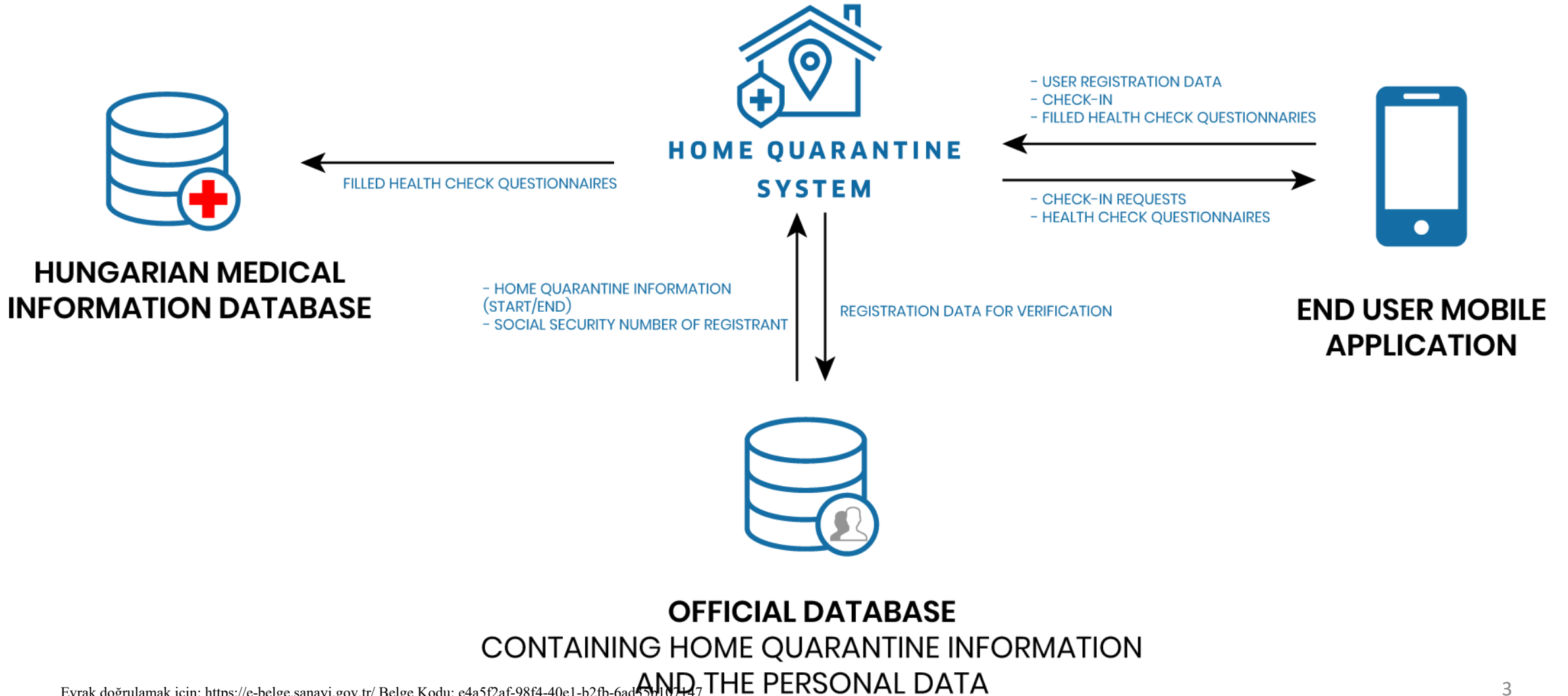
OVERVIEW

The Home Quarantine System (HQS) allows authorities to automatically **check people's compliance in home quarantine with home quarantine rules** and to **continuously monitor their state of health**.

People in home quarantine are required to install and use a mobile application that helps the authorities to automatically monitor compliance with home quarantine rules (e.g.: not leaving their place of residence) and carry out medical health through daily questionnaires.

The authorities monitor the operation through an administrator interface that **lists quarantined people, automatically notifies the operator of missed check-ins** and helps in the prediction of strain on local healthcare capacities imposed by COVID-19 patients.

SIMPLIFIED SYSTEM ARCHITECTURE (HUNGARIAN MODEL)



USER ROLES IN THE SYSTEM

Users of quarantine software are divided into two groups:

Operator:

- Monitoring home quarantine status of patients
- Doing manual checks when an automatic check-in process is obstructed
- Contacting doctors/police in cases when manual intervention/investigation is required

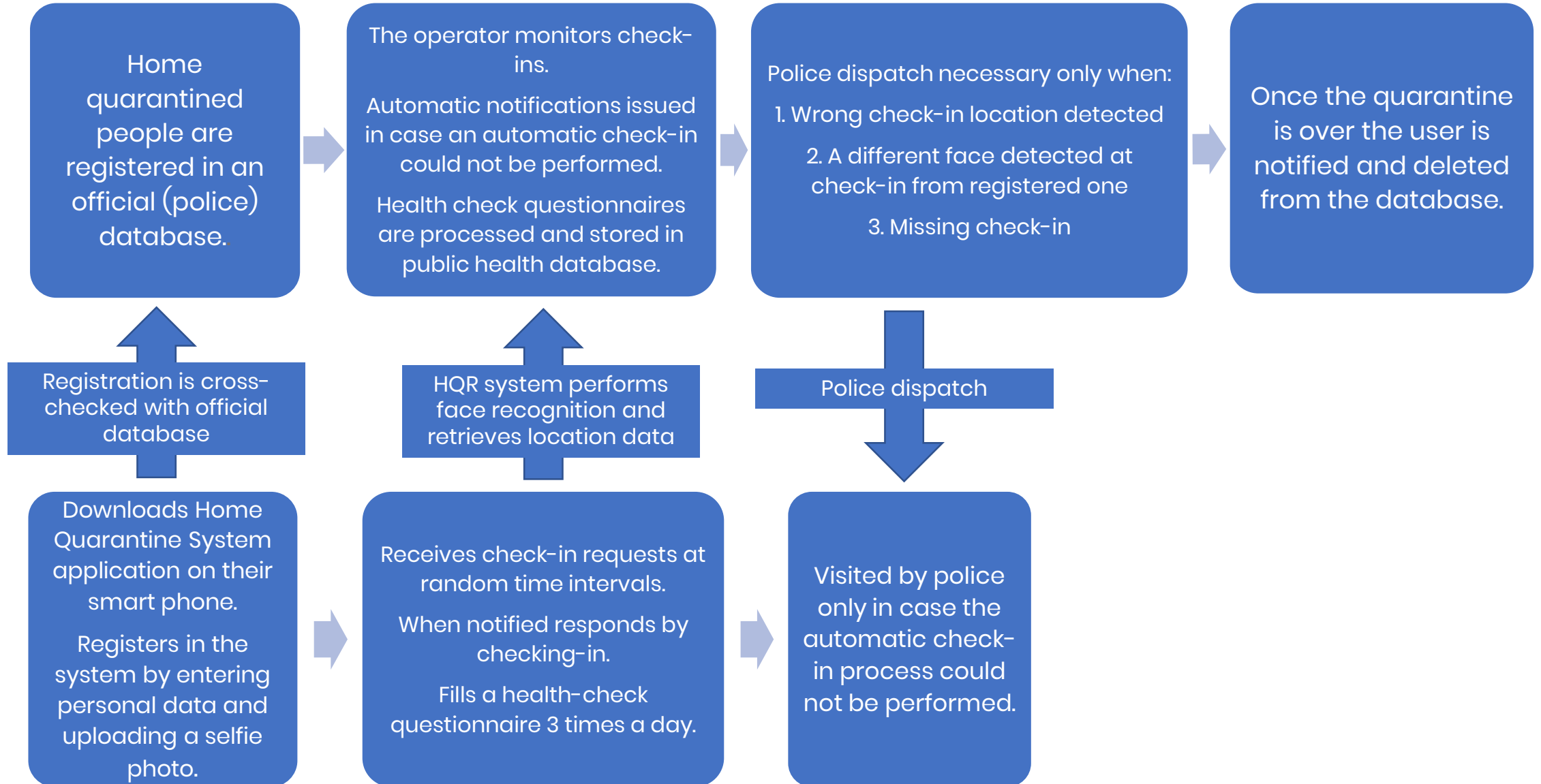
Quarantine patient:

- Needs to download the HQS application on their portable device
- Required to do check-ins at random time intervals through the application

WORKFLOW OF THE HUNGARIAN HQS MODEL

AUTHORITIES

PERSON IN HOME QUARANTINE



CHECK-IN PROCESS I.

The check-in procedure for people in the home quarantine is easy, the patient needs to start the previously downloaded HQS application and look in the camera of the mobile device.

The system automatically starts the camera, makes pictures and verifies the user's identity and location.



Identity is verified using Asura Technologies' proprietary **face recognition technology**.



The location is verified by extracting **the smartphone's location information**.

CHECK-IN PROCESS II.

A **check-in is successful** when the patient's identity is verified by matching the selfie photo with the reference photo submitted at registration and the location retrieved from the smart phone corresponds to the registered quarantine address.

A **check-in is missed** when the system cannot verify the patient, or the location data do not match the recorded quarantine location. In these cases the operator is required to issue a manual check.

The system can not be circumvented:

- **Anti-spoofing:** HQS is able to distinguish between live and fake faces, e.g.: it detects if a photo is presented instead of a real face
- **The system automatically detects attempts at faking the device's GPS location and alerts the operator**

MEDICAL STATUS MONITORING

The HQR system offers an option to send medical health check questionnaires to home quarantined people through the app. Which they fill and send back three times a day in the Hungarian version.

Questionnaires can be evaluated automatically based on a pre-prepared set of criteria. Based on the results, patients can be categorized according to their condition, using color coding to tag people in similar medical conditions. This information - when mapped properly - can help in the prediction of strain on local healthcare capacities imposed by COVID-19 patients. In Hungary the results of the questionnaires are stored in the central Electronic Health Database.

The benefit of the function for the individual is that with the help of the completed questionnaires, their GP can continuously monitor their condition through the Electronic Health Database, so that as the situation becomes more severe, the patient can receive medical help even sooner.

ADVANTAGES OF HQS

- The automation of monitoring allows the resources devoted to check home quarantined people to be used in other areas of fighting the epidemic
- Even at the peak of the epidemic, there will be enough human resources to control home quarantined people who are unable to take advantage of the application.
- Continuous monitoring of the condition of infected or people suspected to be infected may allow rapid intervention in the event of the deterioration of their medical condition – thereby reducing health risks and reducing the cost of treatment.

ABOUT THE COMPANY

Asura Technologies is a Hungarian owned company developing software based on **Artificial Intelligence**.

Initially, the company developed license plate and vehicle recognition software and continually expanded its product range to include other analytical software such as automatic face recognition.

Asura Technologies was awarded the Innovation Award for one of the world's most acclaimed transport technology exhibitions in 2018, followed by the Climate-friendly Start-up Award for the Virtual Power Plant Program in March this year.

The company developed the HQS system in response to the COVID-19 threat which was implemented in Hungary to help the authorities contain the epidemic. The software development was performed in close cooperation with the National Health Care Service Center of Hungary, the Hungarian Police and the Ministry of Interior Affairs.

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