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IOT NETWORK ALGORITHM FOR PRODUCTION QUALITY CONTROL

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When automating the management of dairy production, remote control of milk quality is used, which must meet international standards. One approach for evaluating milk quality is to use critical control points. These points can be used as the main indicators of milk quality: fat, protein, SOMO, dry matter, density, lactose, added water, etc. To automate the task of milk quality control, we are developing an Internet of things (IoT) network [1].

The application for the sensor should look like this: when you enter the application, the main page displays a table with the following milk data: acidity, temperature, density, freezing point, bacterial contamination, somatic cells. The data depends on the type of milk [2].

In a cloud environment, a server containing databases, an API, and a client application is involved. The database stores the data received from farms, the recorded characteristics of milk. Then the data is sent to the server using an API request, which compares the current milk indicators with the range of indicators of this type of milk and this data is stored in the database.

The client application reflects on the screen the recorded and received milk indicators through the mobile application of the operator-administrator. On each of the mobile devices with the application installed, displaying information about monitoring the quality of milk from the cloud database, you can see the removed indicators, also daily at 12:00 a newsletter with current information about the quality characteristics of milk arrives to the email addresses of registered users [3]

The algorithm for creating the Internet of Things looks like this:

1. Sensors measure the parameters of processes or devices that interact with the IoT platform using development tools (SDK).

2. Devices send messages that are verified by the authentication and authorization service of the platform. In case of unsuccessful verification, correction of device IDs is required.

3. Information from devices is sent to the gateway (Device Gateway), various network protocols can be used. Being transformed in the gateway, the information arrives at the processing unit, where communication with analytics is carried out and in parallel to the device storage unit (Device Shadows).

4. Device shadows stores the current states of network peripherals for constant access to software applications. If there is no connection with a separate device on the network, the Device Shadow block executes commands from applications, and when the connection is restored, it synchronizes the current state with the device.

5. The rule handler, depending on the nature of the incoming data, performs the following actions: saves data in a database, sends information via SMS or e-mail to the network manager about their receipt, calls the HTTP API, sends data to the analytics system, etc.

6. Applications use this data to monitor and manage devices using the API (application interface).

7. Information about all devices is stored on the IoT platform.

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