

White **Paper**

 SAFESTEPS

SAFE STEPS

SECURE YOUR WORKFORCE WITHIN YOUR FACILITY AGAINST VIRUS CONTAMINATION

Boni Global has rapidly developed a comprehensive COVID-19 solution for businesses called SAFE STEPS, an integrated set of tools that will help businesses ensure the safety of their employees by automating social distancing measures and contact tracing. With this solution, employees are warned in real time when they break social distance with wearable devices with light/buzzer notifications using BLE technology. In the case of contamination, SAFE STEPS provides filiation reports by recording all close social interactions and identifying the employees or visitors who are at risk. The SAFE STEPS solution includes wearable devices, a supporting mobile application where users can change wearable device settings, view battery status and their social distancing score, as well as a management panel that allows administrators to record interactions and create filiation reports.

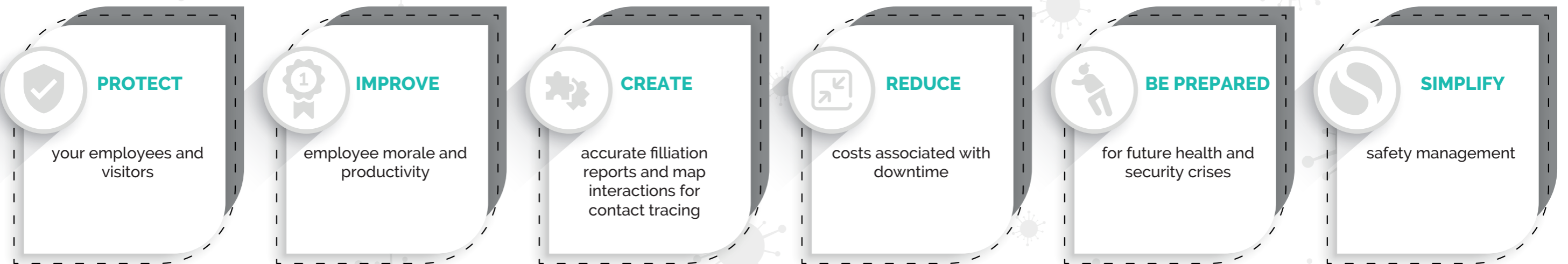


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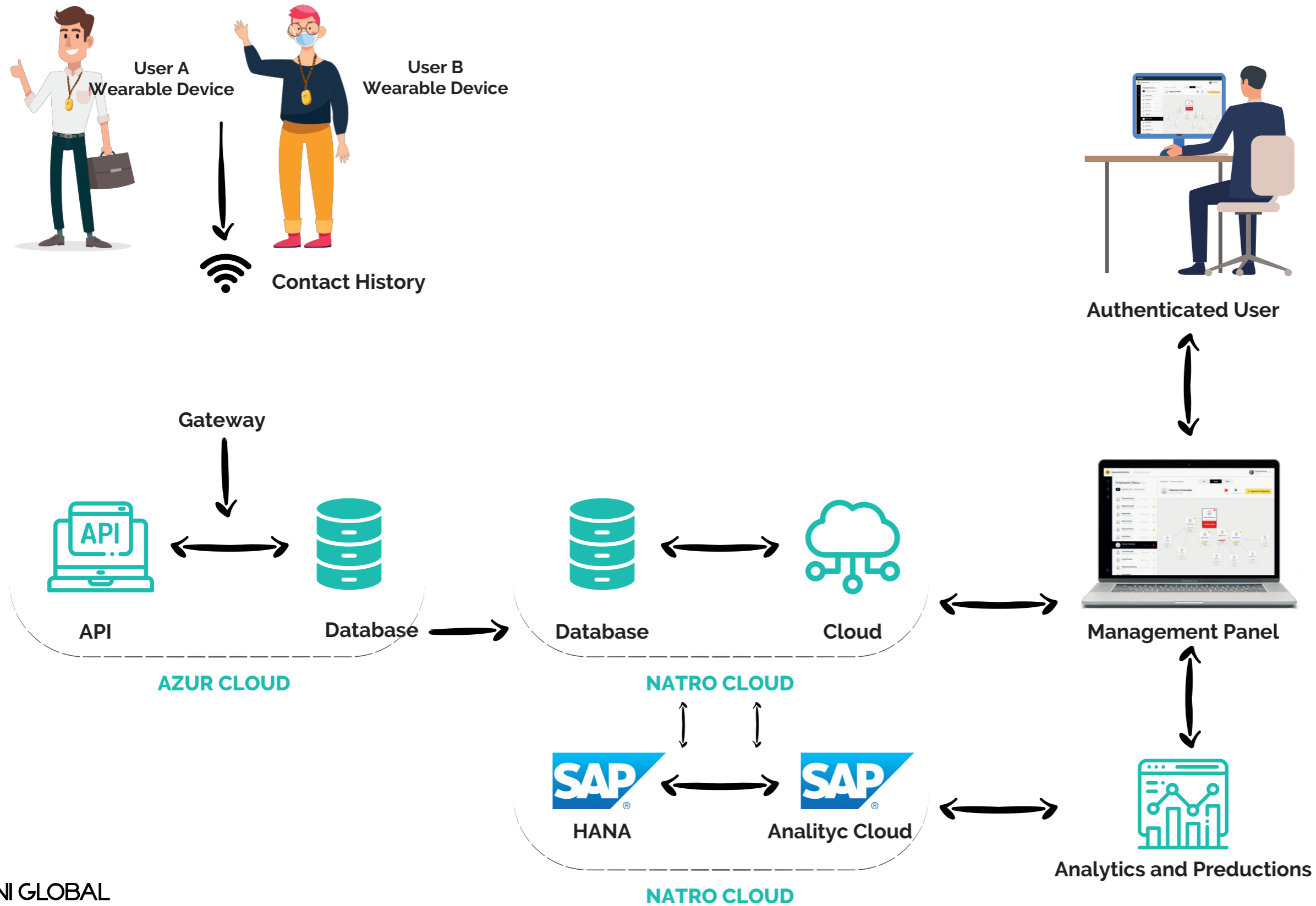
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HOW

IT WORKS ?

There is a unique id for each user registered to the system and the interaction between devices are detected by BLE technology. The devices broadcast continuously as well scanning. During this scanning, they detect other devices and then they connect them to write their own id information. Detected interactions are saved to the local databases and the server via API running in the cloud.



HOW

IT WORKS ?

3.1 WEARABLE DEVICES

The wearable device does radio signal broadcast and at the same time listens to other signals from other devices using Bluetooth Low Energy (BLE) technology. When the wearable device interacts with any wearable device, it records the interaction information in the data storage unit. Wearable devices publish the number of logs in the data storage units as well as "broadcastId" information during their broadcasting.

Mobile devices or Gateways query the held log information on the wearable devices while they are scanning, and in the case of registered logs, take the logs and transmit them to the server. After this process, the logs on the wearable device are reset and new interactions are recorded.

The wearable devices notify the employees if the social distance is broken while tracking their contact information.

The devices are customizable and safe to use in risky zones as well, and are equipped with a buzz indicator that notify employees and an LED indicator to be used in louder areas.

3.2 MOBILE APPLICATION

The mobile application runs in the background continuously; doing radio signal broadcast and listening to signals from other devices using Bluetooth Low Energy (BLE) technology. The application is a supporting solution for the wearable devices, that aims to trace physical interactions between the Employees, record, and save physical interaction between them using contact information. The mobile app sends held logs of the wearable devices to the server, where the logs are saved and the user's current social distance score is calculated. The updated score is shown to the user through an interface on the mobile app.



HOW

IT WORKS ?

3.3 GATEWAY

A gateway is a piece of networking hardware used in telecommunications for data transmission of a device to a server. Wearable devices can detect social distance violations and save them in their memory but they need a supporting device that has an ethernet connection for sending logs to the server. To send logs to the server, the system using gateways is other solution as well as mobile applications. Gateways listen to signals from other devices using Bluetooth Low Energy (BLE) technology. When a gateway detects a device that has held logs, it connects to the device, takes the logs and transmits them to the server using 3G or Wi-Fi connection.



3.4 INTERACTION DETECTION

Any realized social interaction violation is logged by both devices. Thereafter, these two logs are compared for confirmation, and if only one log is seen in one of the devices, the log for the other user will be also created. Thus, if one device may not log the interaction, the interaction will not be missed.



HOW

IT WORKS ?

3.4 INTERACTION DETECTION

The interaction detection process contains three different work cases (phases) described below:

1.

ADVERTISING:

Using advertising data only, both devices and mobile phones can detect each other via BLE advertising data without any pairing.

2.

PAIRING:

using pairing, BLE device preserves interaction data and when finds a mobile phone or gateway, the device sends the interaction data to the server via pairing with any mobile phone or gateway

3.

BONDING:

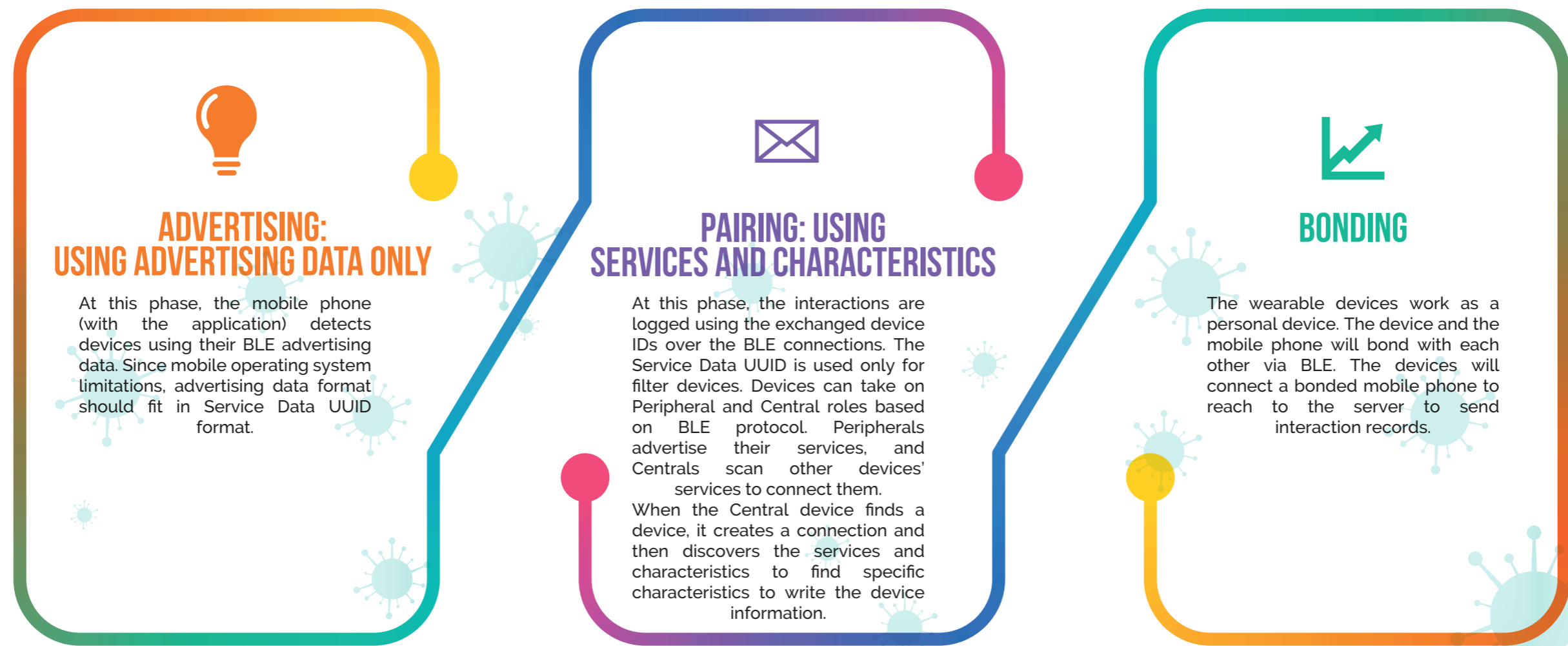
If the user has both a wearable device and a mobile phone together, the device and the mobile phone are bonded together. All interaction logs can be sent using the mobile phone over BLE bonding.



HOW

IT WORKS ?

3.4 INTERACTION DETECTION



**ADVERTISING:
USING ADVERTISING DATA ONLY**

At this phase, the mobile phone (with the application) detects devices using their BLE advertising data. Since mobile operating system limitations, advertising data format should fit in Service Data UUID format.



PAIRING: USING SERVICES AND CHARACTERISTICS

At this phase, the interactions are logged using the exchanged device IDs over the BLE connections. The Service Data UUID is used only for filter devices. Devices can take on Peripheral and Central roles based on BLE protocol. Peripherals advertise their services, and Centrals scan other devices' services to connect them. When the Central device finds a device, it creates a connection and then discovers the services and characteristics to find specific characteristics to write the device information.



BONDING

The wearable devices work as a personal device. The device and the mobile phone will bond with each other via BLE. The devices will connect a bonded mobile phone to reach to the server to send interaction records.

HOW

IT WORKS ?

3.5 TECHNICAL REQUIREMENTS

1. ANDROID APPLICATION

The application is developed using the Kotlin language and for the notification infrastructure, Firebase library is used. It is supported by Android 5 and newer versions. The devices should support BLE standards.

2. IOS APPLICATION

The application is developed using the Swift language and for the notification infrastructure, Firebase library is used. It is supported by iOS 10 and newer versions.



SOCIAL DISTANCE

User's Social Distance Score is calculated with the developed algorithms. The scores change in two steps while user interactions are logged. First, The daily point changes of two users as a result of interaction are calculated. Then, the total points are updated according to the daily point changes. Interacting with a user who has lower points will cause more point decrease.

The users' scores are recorded in 14 days periods daily and retroactively. The daily scores start from 100 for each new day and recalculated as interaction occurs. At the end of each day, the user's social distance scores are recorded and the past 14 days' total points are shown to the user.



MANAGEMENT

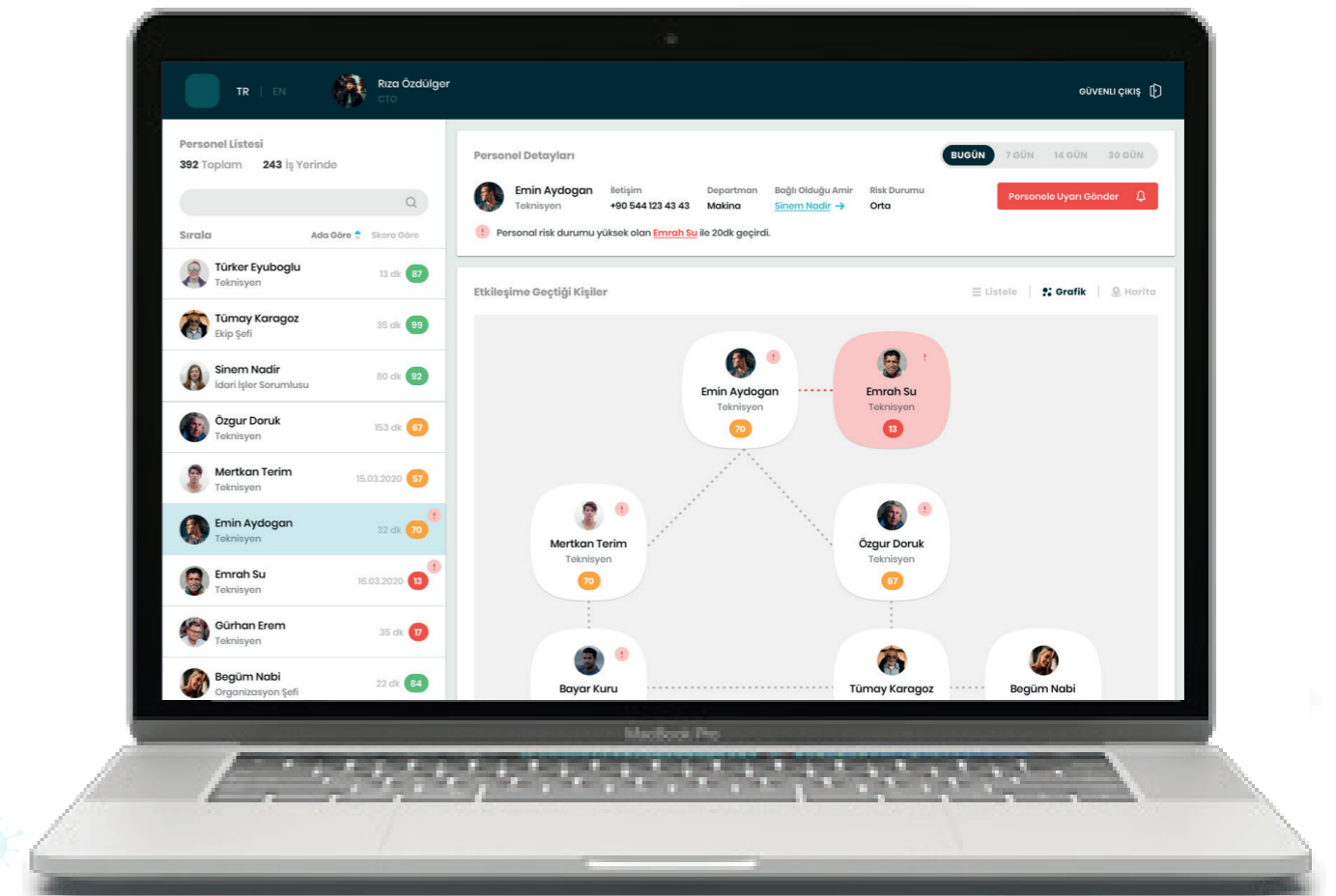
PANEL

Boni work safety panel is a web based platform where the organization's personnels can be listed, the interactions and scores of personnels are monitored and the past user interactions can be reported

5.1 FUNCTIONS OF PANEL

- Personnel information management,
 - Adding personnel,
 - Editing personnel,
 - Deleting personnel,
 - Viewing personnel list.
- Device management,
 - Adding device information,
 - Editing device information,
 - Deleting device information,
- Personnel - device match,
 - Viewing device list.
- Personnel interaction monitoring,
- Personnel interaction statistics and reports monitoring

These processes can be managed by the administration.



MANAGEMENT

PANEL

5.2 ACCESS LEVELS

The user can access the panel using unique credentials. By means of user-specific role definition, the users can only see the features for which they are authorized. There are 3 different authorization level for the administration panel:



MANAGEMENT

PANEL

5.3 INTEGRATIONS

Boni Global provides an integrated solution in Safe Steps with its products - Indoor Mapping, Indoor Navigation, Indoor Tracking, Accessibility Solutions, Indoor Analytics and Geofencing Services - Safe Steps has been developed in integration with SAP and it can easily integrate with SAP products that companies have. In addition to current integrations, Safe Steps can integrate with 3rd party applications such as HR Suit, Access System, etc.

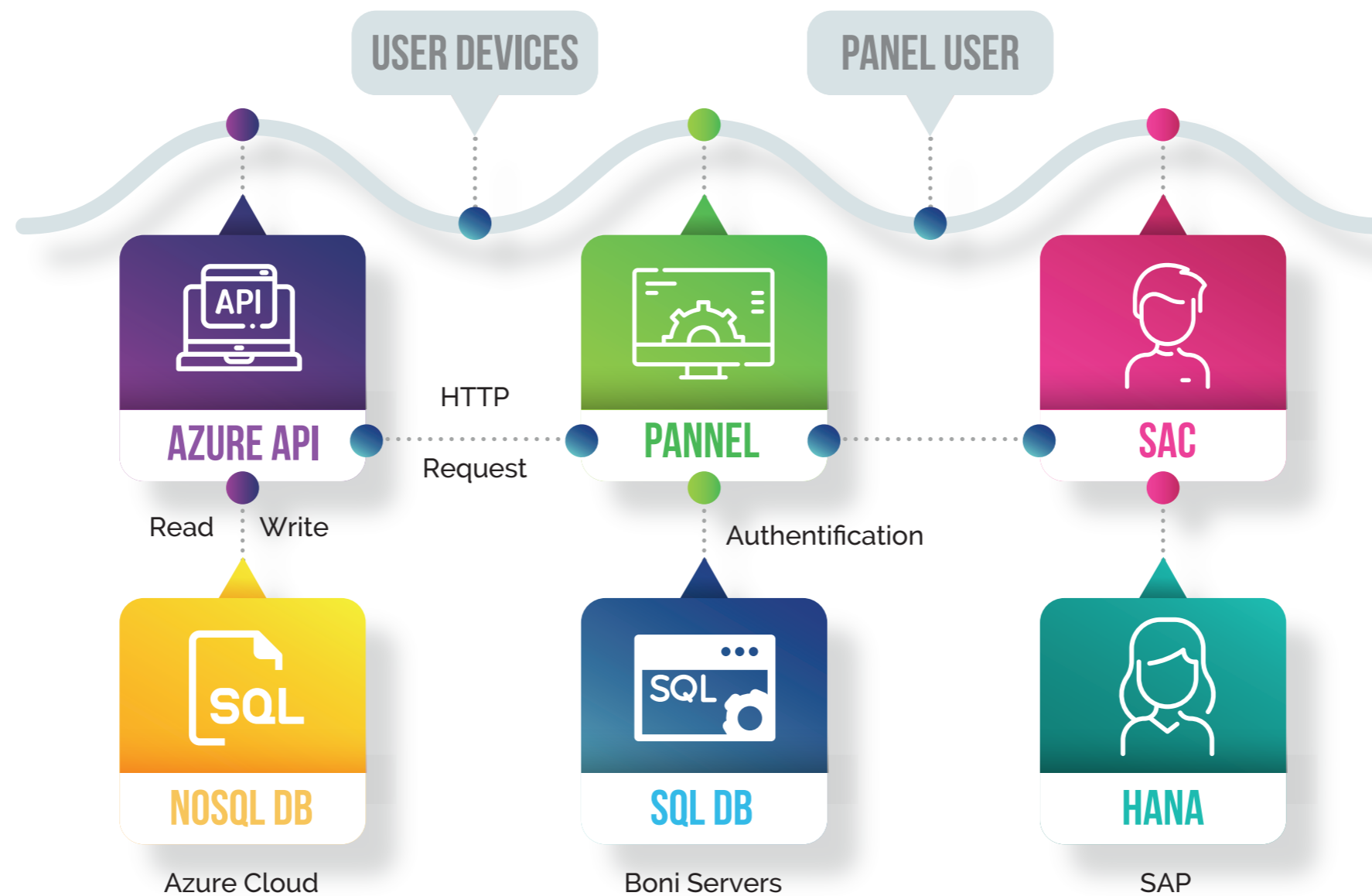


SYSTEM

ARCHITECTURE

6.1 SYSTEM ARCHITECTURE WITH CLOUD SERVICES

Application services and the interaction database are held on the Microsoft Azure Cloud. The administration panel and the authentication database are held in servers of Natro Company. The system is developed and secured by taking proper precautions on the most current security vulnerabilities, and security tests are performed by contracted authorized companies on a regular basis.



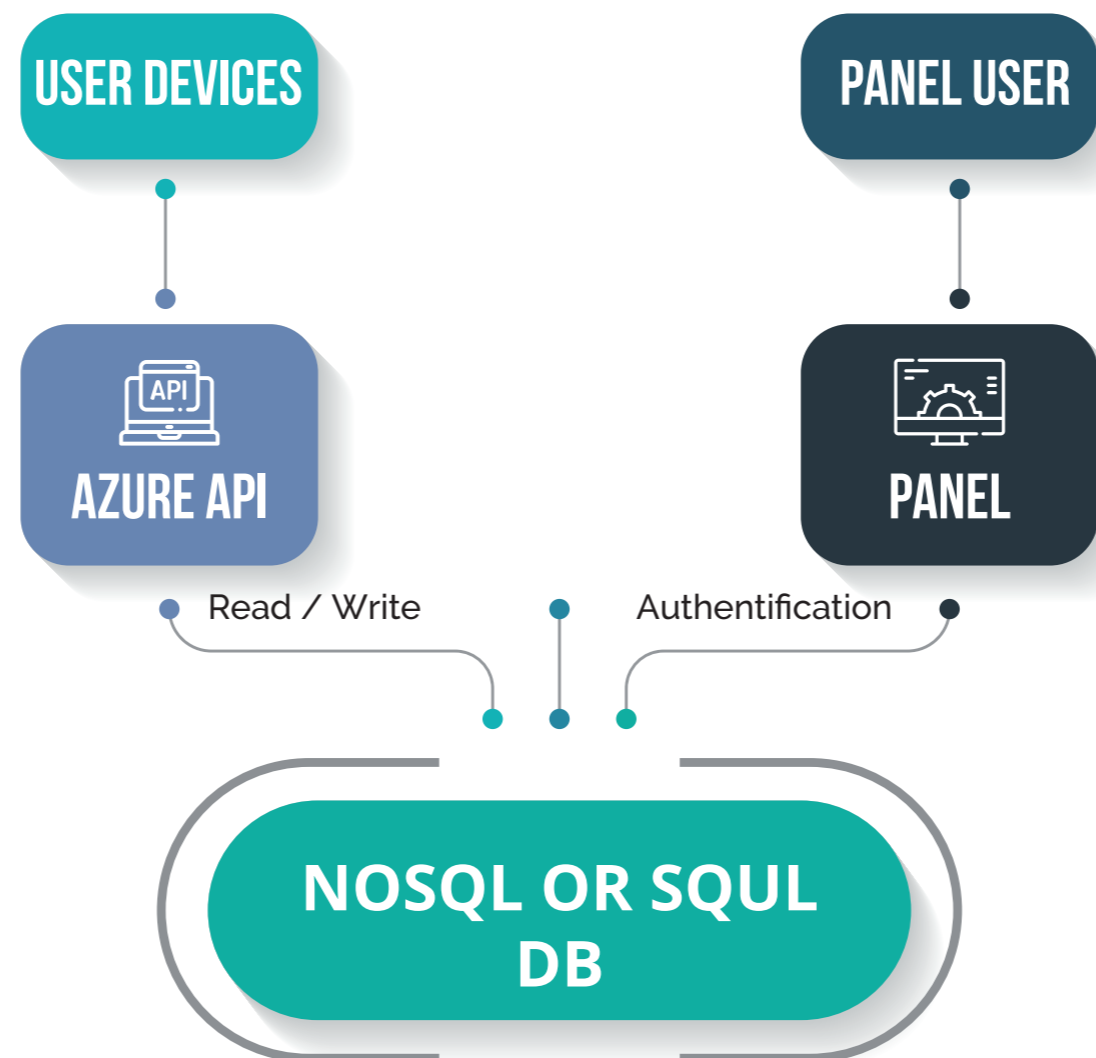
SYSTEM

ARCHITECTURE

6.2 ON-PREMISES SYSTEM ARCHITECTURE

The work safety application and services of Boni Global are hosted and run on the cloud. In this regard, all the data security and maintenance of services are provided by Boni Global. The companies may request to host the system in their own premises. In that case, it is possible to establish the server applications on the company's own servers and then to maintain the system via these servers.

Server applications and services can be run in the Windows environment that is provided by the company. It is especially preferable for the companies that demand to keep their data within.



SUMMARY

OF FEATURES

WEARABLE DEVICES

- Uses BLE technology to communicate with other devices and record interactions
- Customizable
 - Minimum social distance
 - Time length of interactions
 - Warning mode: light or buzzer
- Casing to protect from dust or water damage
- Long battery life
- Lightweight
- Reduced Gateway installation operations
- Time saving and cost efficient

MOBILE APPLICATION

- Graphical based interface for the users
- Customization of the wearable devices in personal, team or company level
- Social Distancing Score to incentivize users to keep their social distance

MANAGEMENT PANEL

- Personnel information management,
 - Adding personnel,
 - Editing personnel,
 - Deleting personnel,
 - Viewing personnel list.
- Device management,
 - Adding device information,
 - Editing device information,
 - Deleting device information,
 - Personnel - device match,
 - Viewing device list.
- Personnel interaction monitoring,
- Personnel interaction statistics and reports monitoring
- Ready-to-use dashboards for Social Distancing Monitoring
- Advanced Network Analytics like Social Network Analysis
- Advanced AI for anticipating effects of social distancing to daily business process
- Powered by SAP HANA and Analytics Cloud

USE

CASES FOR SAFE STEPS

Safe Steps can be used in any venue where occupants are known and the entries/exits can be controlled so that all visitors and occupants can be given a wearable device. The solution is especially beneficial for complex and crowded venues where traditional measures such as floor markings and screens cannot be implemented for social distancing. The solution can be used in industrial settings such as offices, manufacturing facilities and warehouses; in hospitality use cases are hotels, events and cruise ships and in healthcare facilities like clinics and hospitals. In every usage situation, permanent and temporary occupants of the venue will be assigned wearable devices, their social distance compliance will be measured and they will be warned in case they are at risk of transmission. The contact tracing feature can be used in conjunction to ensure the venue's safety.



FAQ

Do these applications and devices share my info with third parties? Where is my data stored?

The data collected through the application is anonymous and not shared with third parties. Application services and databases are hosted in Microsoft Azure cloud environment. Therefore, the security of servers and data is provided by Microsoft. The solution of Boni Global, developed on the cloud, was developed by taking necessary precautions against the most up-to-date security vulnerabilities, and regular security tests are carried out by competent companies with whom we have contracts. For detailed information, you can review our privacy statement: <https://www.boniglobal.com/privacy/>

Do we need to purchase the device also although I have SAFE STEPS application on the phone?

SAFE STEPS works with wearable devices, measures the social distance between users and the warning mechanism works when social distance rules are violated. The application accompanies the wearable device, through the application, users can see their social distance scores, access the alert settings and battery status of the wearable devices.

Which parts of my data does the application have access to on my phone? Is my private data safe?

The application does not have access to the data on the phone, the personal data of the users are protected.

We've started using SAFE STEPS at work. Does this mean our employer is tracking our movements?

Movement and location data are not collected with the application, only interaction information between users is used anonymously.

Does the app or device cause constant radiation

The application does not have an effect to increase the radiation emitted from mobile phones, and wearable devices work with BLE technology. Bluetooth radio frequencies do not carry enough energy to directly break or alter your DNA. It is recommended that people with only pacemakers keep their wearable devices 20 cm away from their heart rate.

Will my employer be able to track my movement outside of work?

SAFE STEPS does not use location data, so users' movements at work or outside are not monitored.

Which businesses are suitable for SAFE STEPS? What's the minimum amount of employees required? What's the maximum number possible?

SAFE STEPS can be used in areas such as workplaces, industrial facilities, hotels, cruise ships where there are permanent personnel and where entrances and exits are kept under control. There is no upper or lower limit for the number of employees.

How is the pricing of the product?

Pricing is planned according to the number of users for each venue. Payments are made through a monthly subscription system.

Why is the app not on the iOS App Store?

We are working to make sure that the application can also be accessed from the iOS App Store.



Thank **You**

 SAFESTEPS