



The PRECIOUS platform

PREventive Care Infrastructure based On
Ubiquitous Sensing

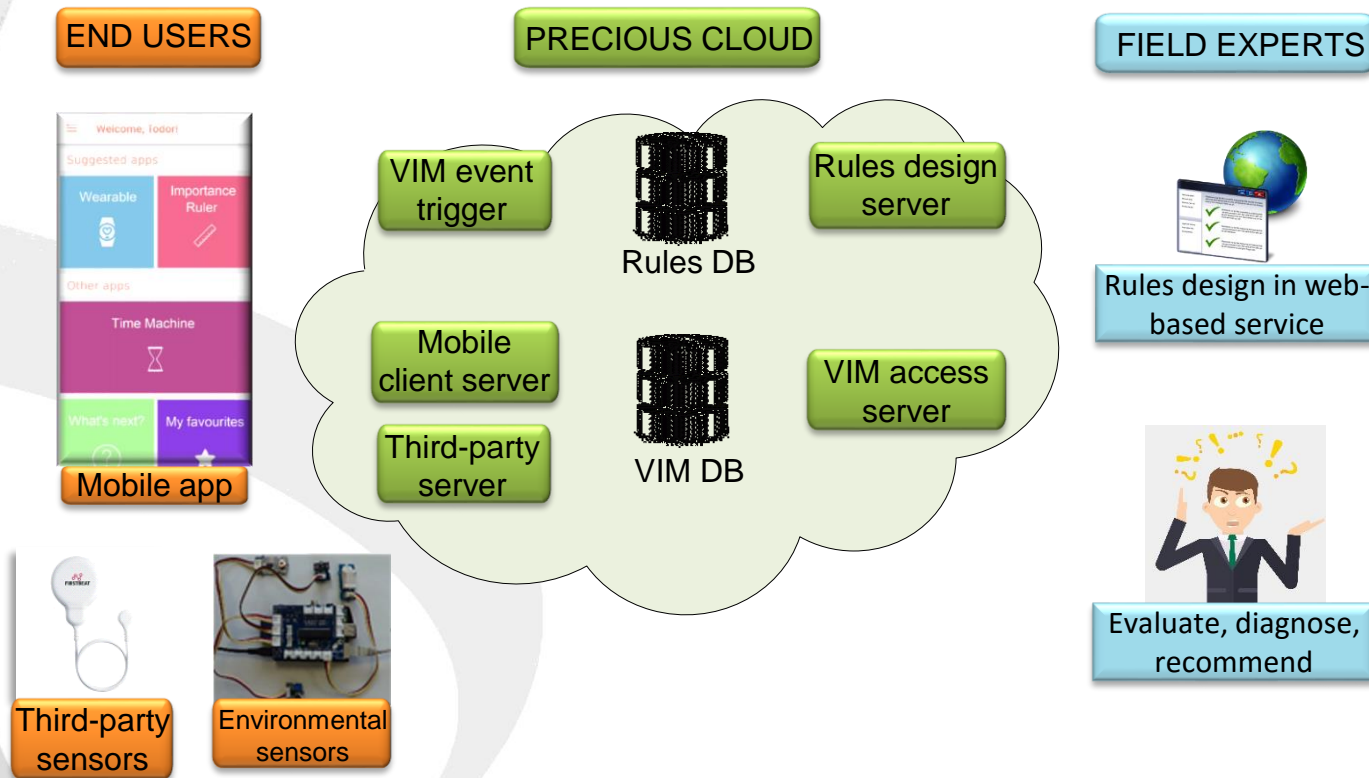
Outline

- Overview of the platform
- Smartphone application
- Third party devices
- Virtual Individual Model and rule system
- Future vision



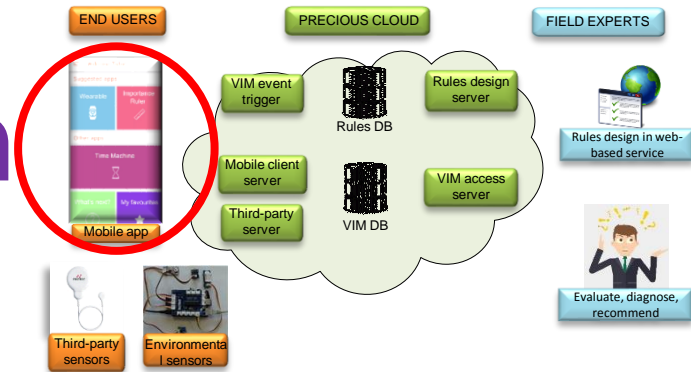
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The Precious platform



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Precious application

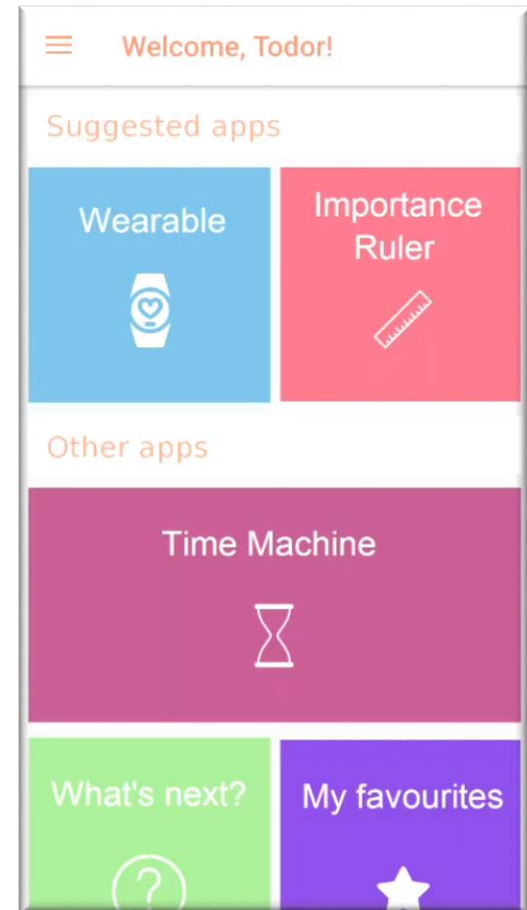


- Accessible
 - Compatible with 74% of all the smartphones in the world
 - Free
- Physical activity tracker
 - Low power smartphone sensors
 - Walking, running, cycling, sitting
- Rule-based feedback system
 - Psychologists from University of Helsinki
 - Dietary experts: CampdenBRI and EuroFIR
 - Medical staff from Vall d'Hebron University Hospital
 - Professional coaches from Firstbeat Technologies



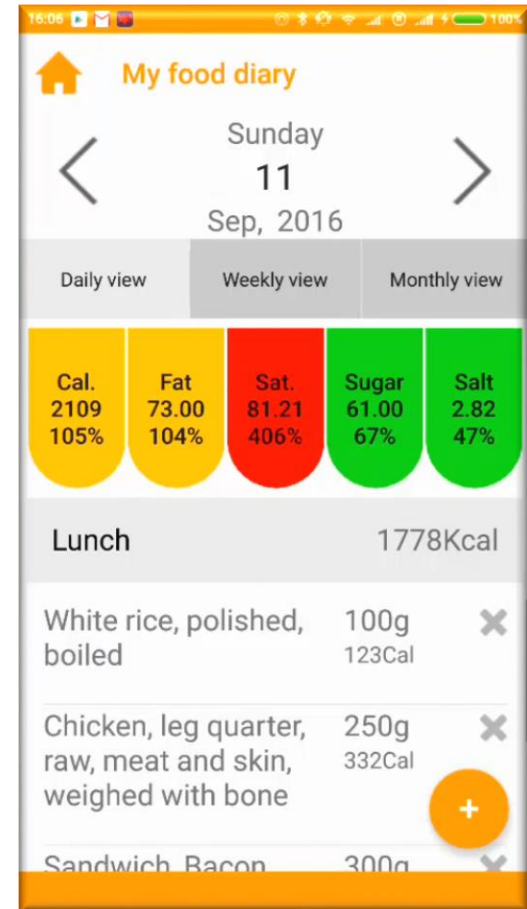
Main screen

- Efficient integration of third-party apps into the Precious ecosystem
- Behaviour-based recommendations
- Easy and clear access to different platform components
- Trials
 - Limit test users access
 - Test which components perform better



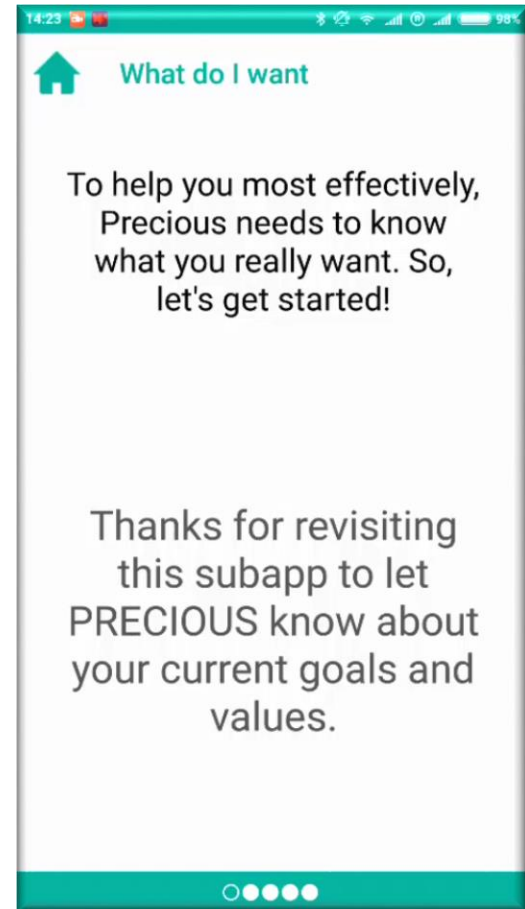
Food diary

- CampdenBRI diet recommendations
 - Color coding scheme
 - Each food item
 - Daily recommendation
- EuroFIR food database
 - High quality, validated national food composition data
 - Country-specific food items
 - Standard
 - National Food Composition Data (FCD) for UK, Spain and Finland
- User can see progress
 - In terms of Calories, Fats, etc.



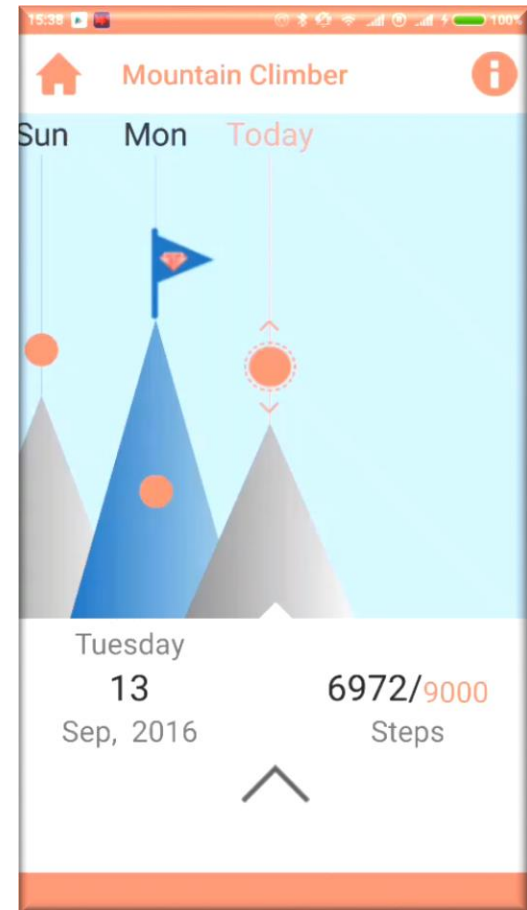
Motivational interviewing

- Feel more connected to the app
 - Motivation
 - Engagement
 - Outcome goal, importance ruler, confidence ruler, time machine, etc.
- Let the user think about goal and behaviour
- This information is then used to improve the app-user interaction
 - Feedback system
 - Recommendations
 - Reminders



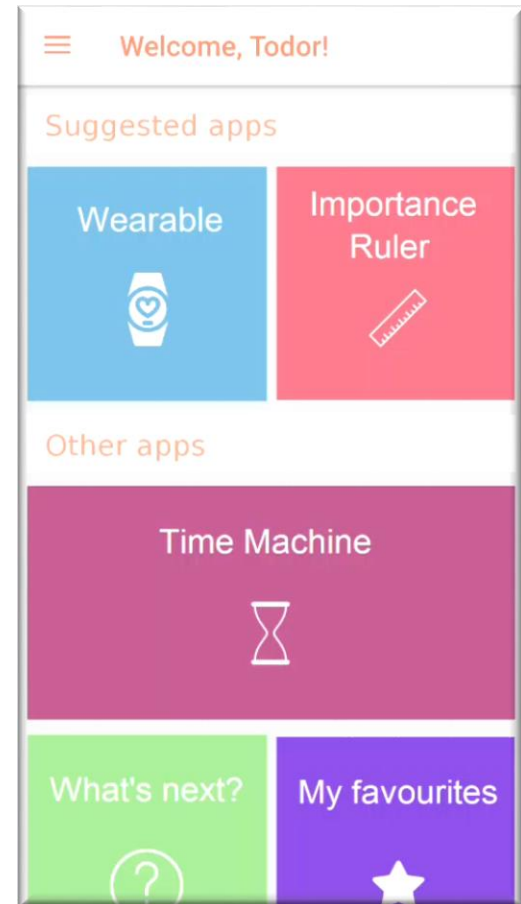
Mountain Climber

- Smartphone sensors
 - Walking, running, cycling
 - Fair accuracy
 - Low energy
 - Need to carry smartphone everywhere
- Gamification
- Plan and log activities
 - 47 activity types
 - Translation into a single unit (steps equivalent)



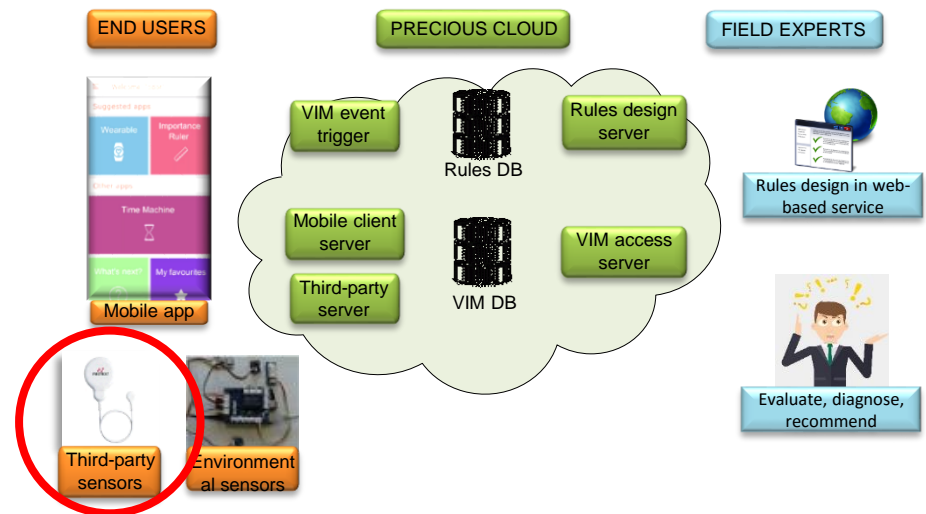
Journey-View

- Gamification
 - Increase interaction between app and user
- Currently intended as a slide-in drawer view
- Gives overview of points and milestones along a path
- Landscape changes over time
- Animations on new rewards
- Planned: Levels/Badges



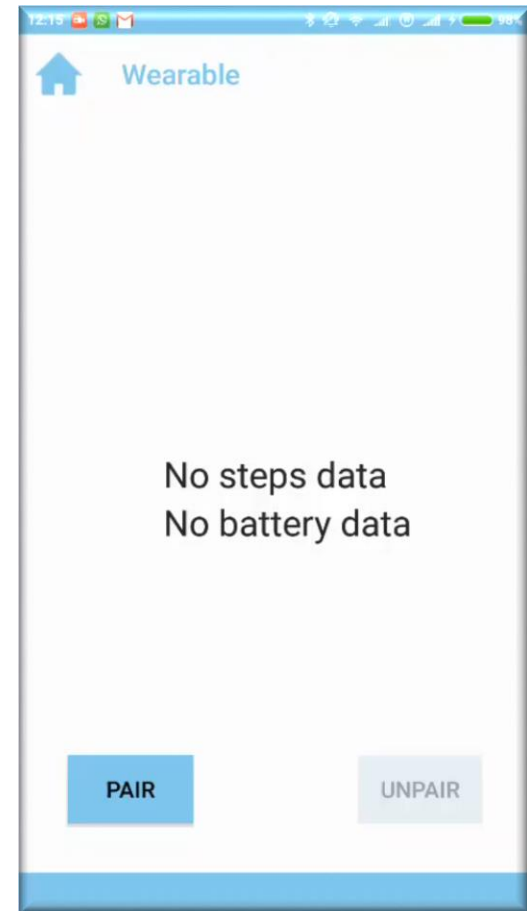
Third party devices

- Off the shelf smart wristband
- Bodyguard 2 from Firstbeat Technologies



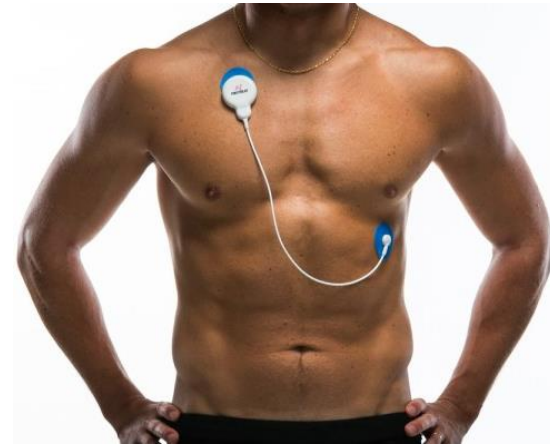
Wristband

- Very accurate 24/7 step counter
- 2-3 weeks battery life
- Data sync every 5min
 - Bluetooth Low Energy
- User-friendly pairing
- Vibrate when important notification is received
 - Goal achieved, battery low reminders, etc.



Firstbeat HRV Analytics

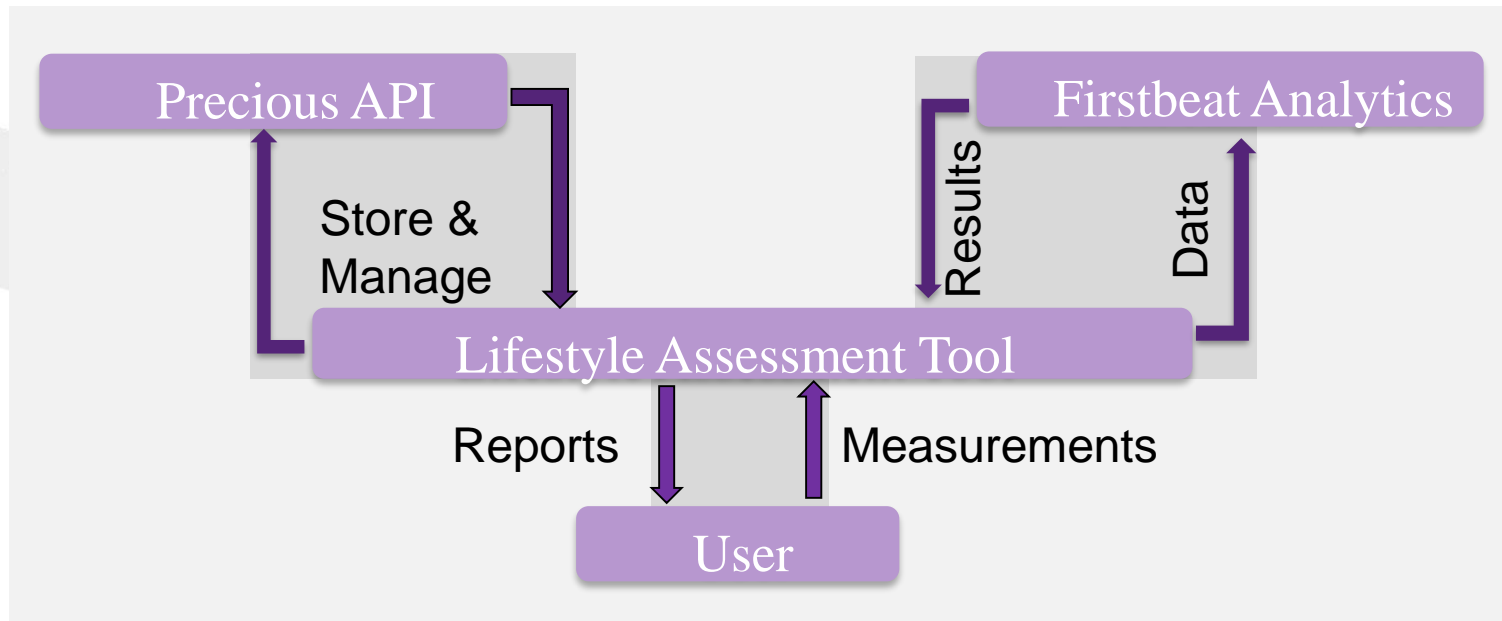
- Bodyguard 2 device
- Firstbeat performs detailed & accurate measurements of
 - stress and recovery
 - sleep
 - exercise
- Precious uses results for
 - deeper user lifestyle insights
 - follow progress
 - customized suggestions
 - create awareness



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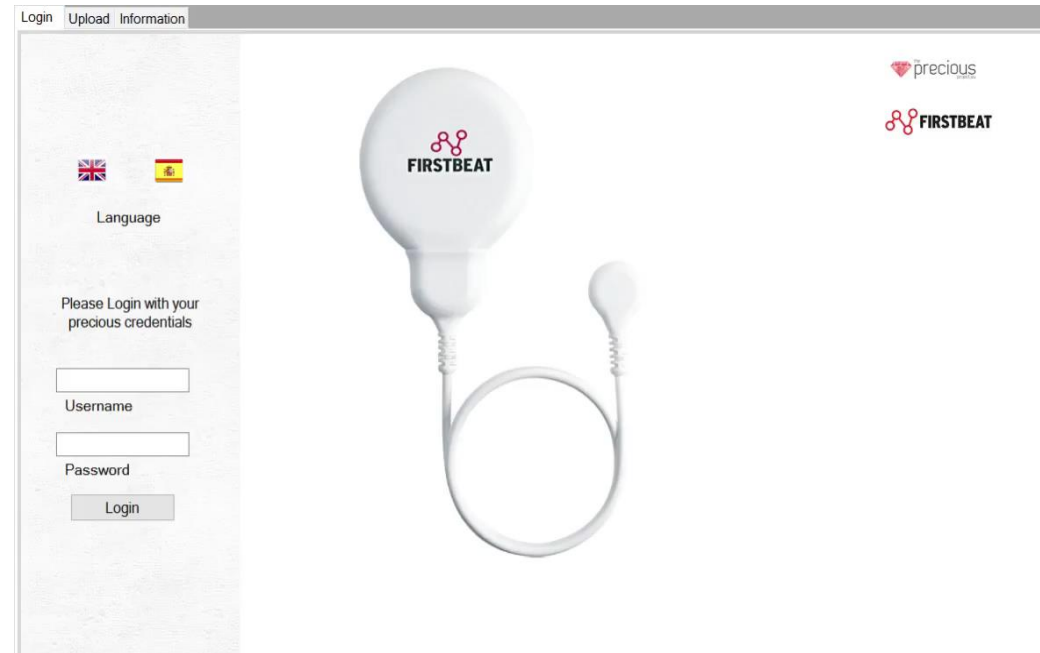
Integration with Precious

- Firstbeat analysis results made available to Precious framework through PC application



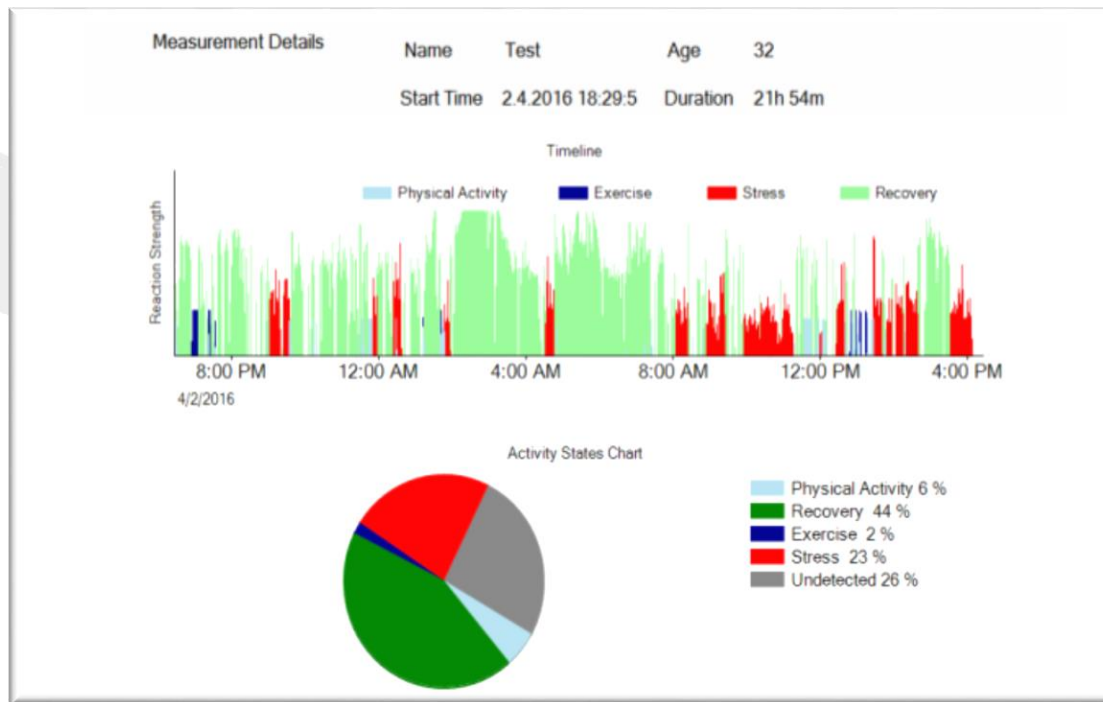
Lifestyle Assessment Application

- PC software
 - No Bluetooth
 - No USB OTG driver
- One click solution
 - find new measurements
 - analyse
 - create reports
 - upload to Precious framework



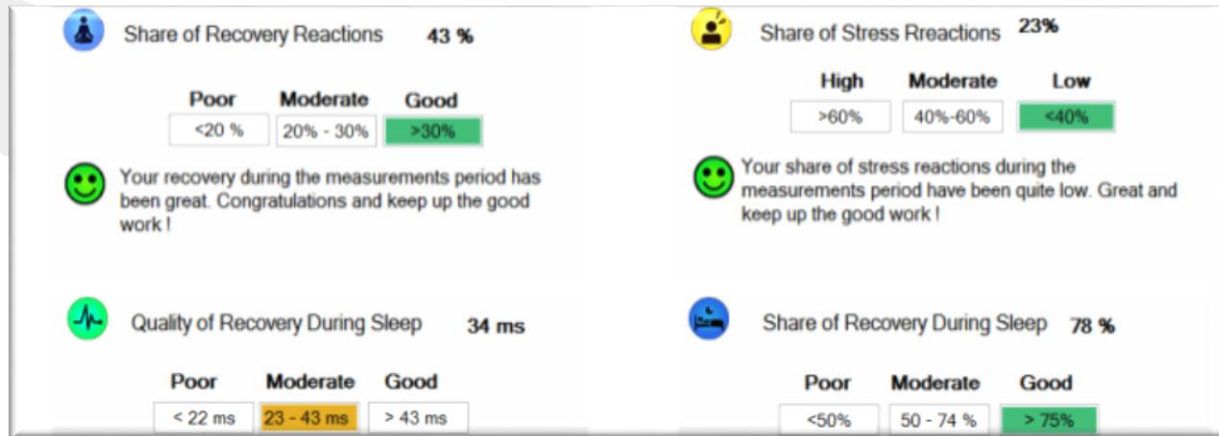
Lifestyle Assessment Report (I)

- Based on Firstbeat's report template
- Timeline: stress, recovery, exercise, light physical activity



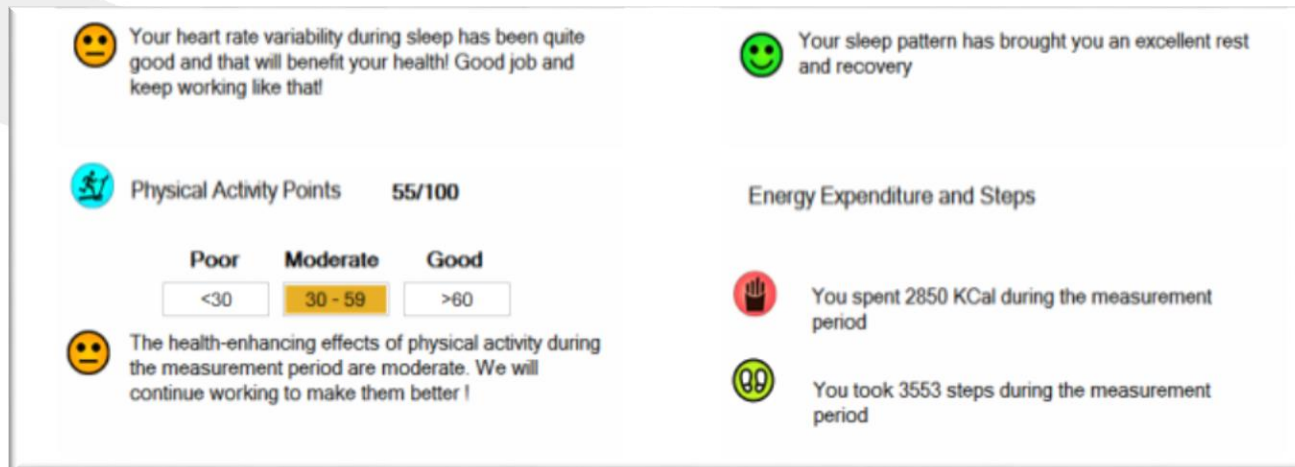
Lifestyle Assessment Report (II)

- Customized Feedback
 - recovery and stress reactions
 - quality and share of recovery during sleep
 - physical activity and energy expenditure



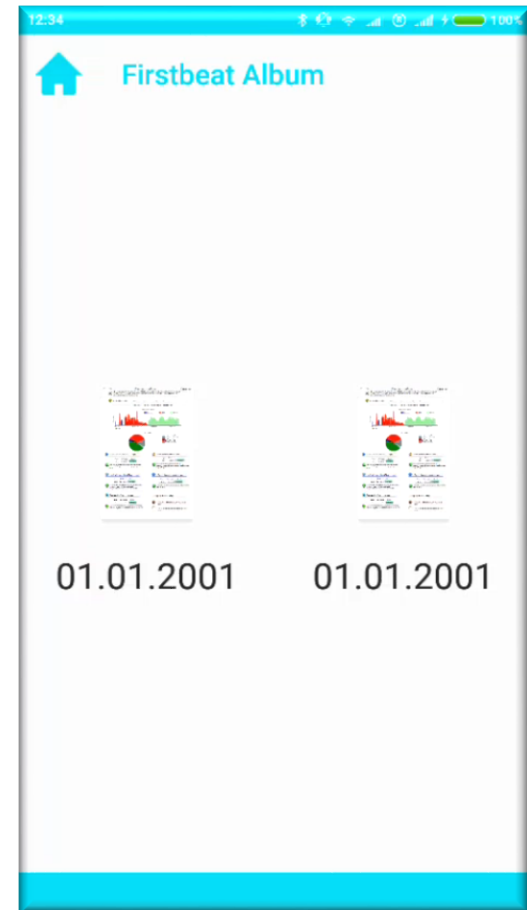
Lifestyle Assessment Report (III)

- Customized Feedback
 - recovery and stress reactions
 - quality and share of recovery during sleep
 - physical activity and energy expenditure

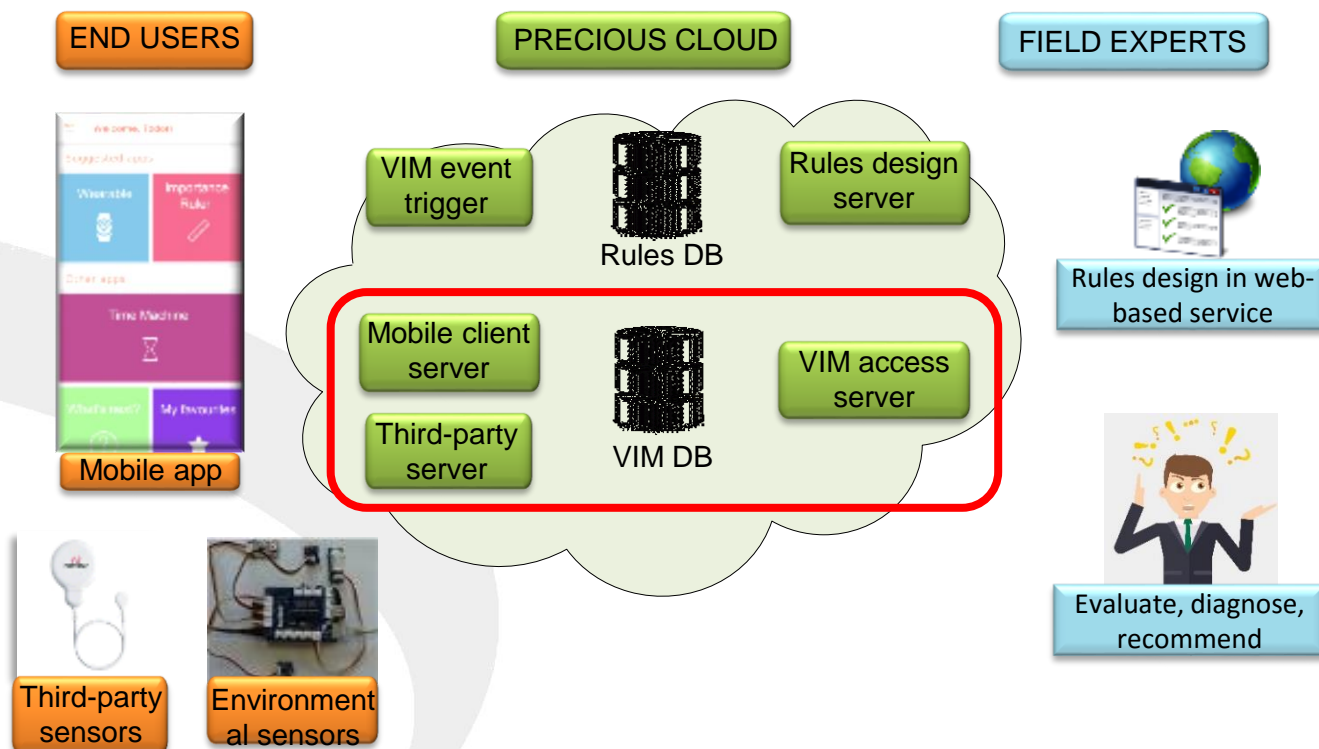


Lifestyle assessment

- Report available in the app
- Album view
- Always accessible



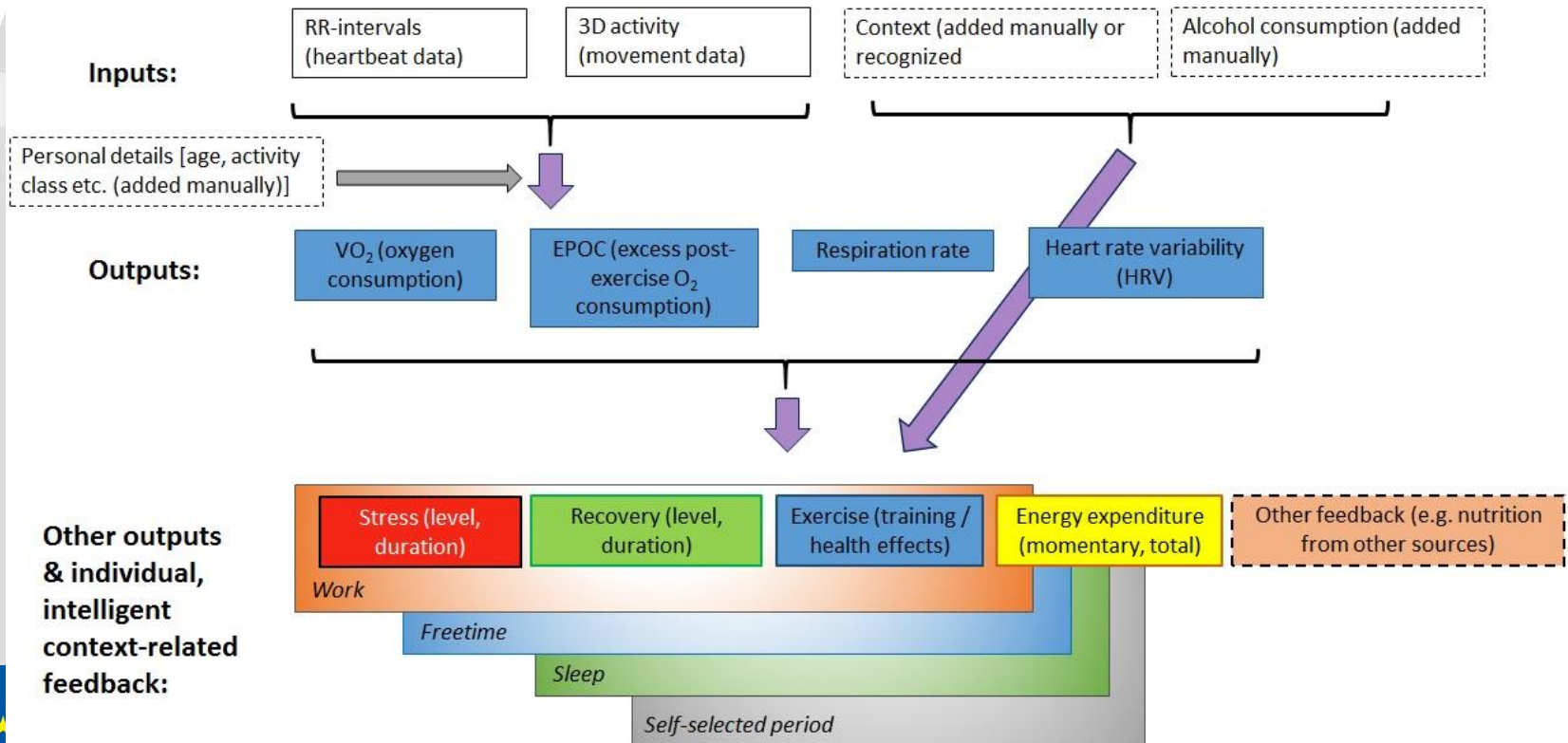
Virtual individual model



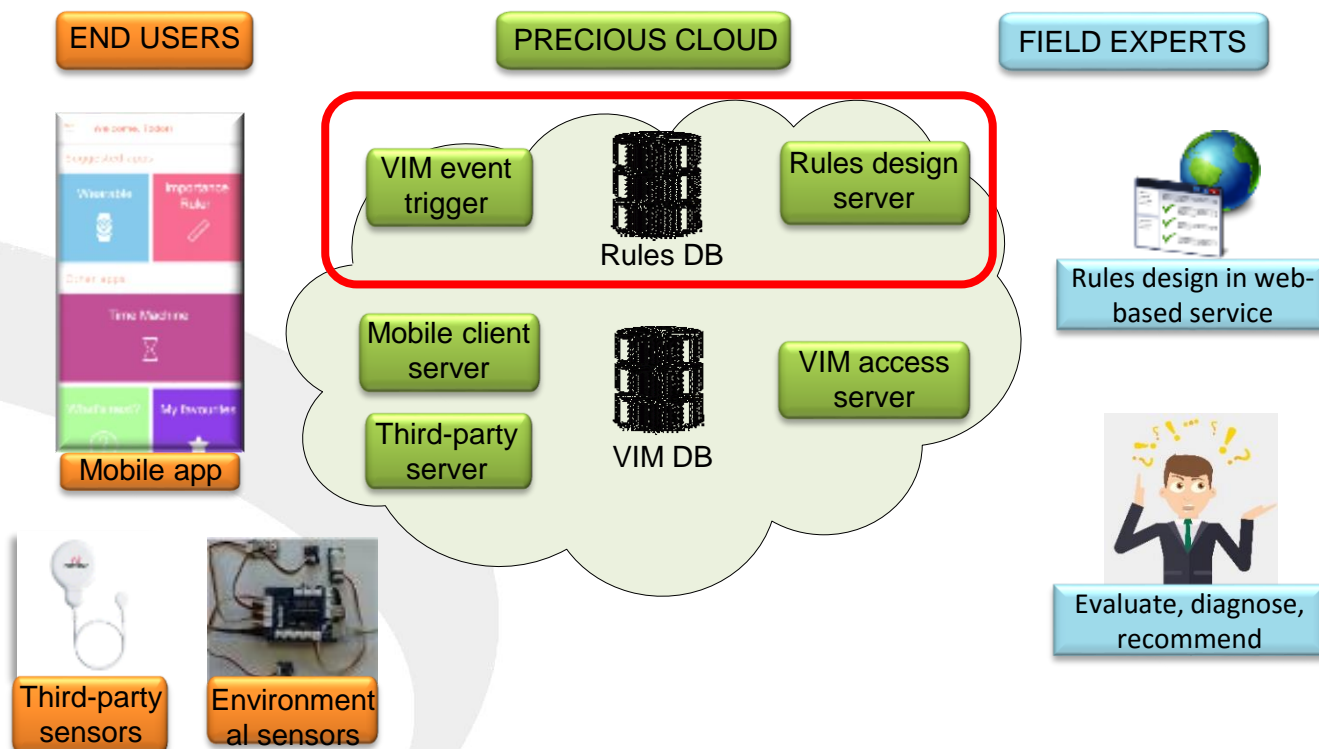
Virtual Individual Model (VIM)

- PRECIOUS VIM combines data from multiple sources
 - Develop individualised risk profile
 - Recommend individually tailored interventions

Virtual Individual Model (Precious)

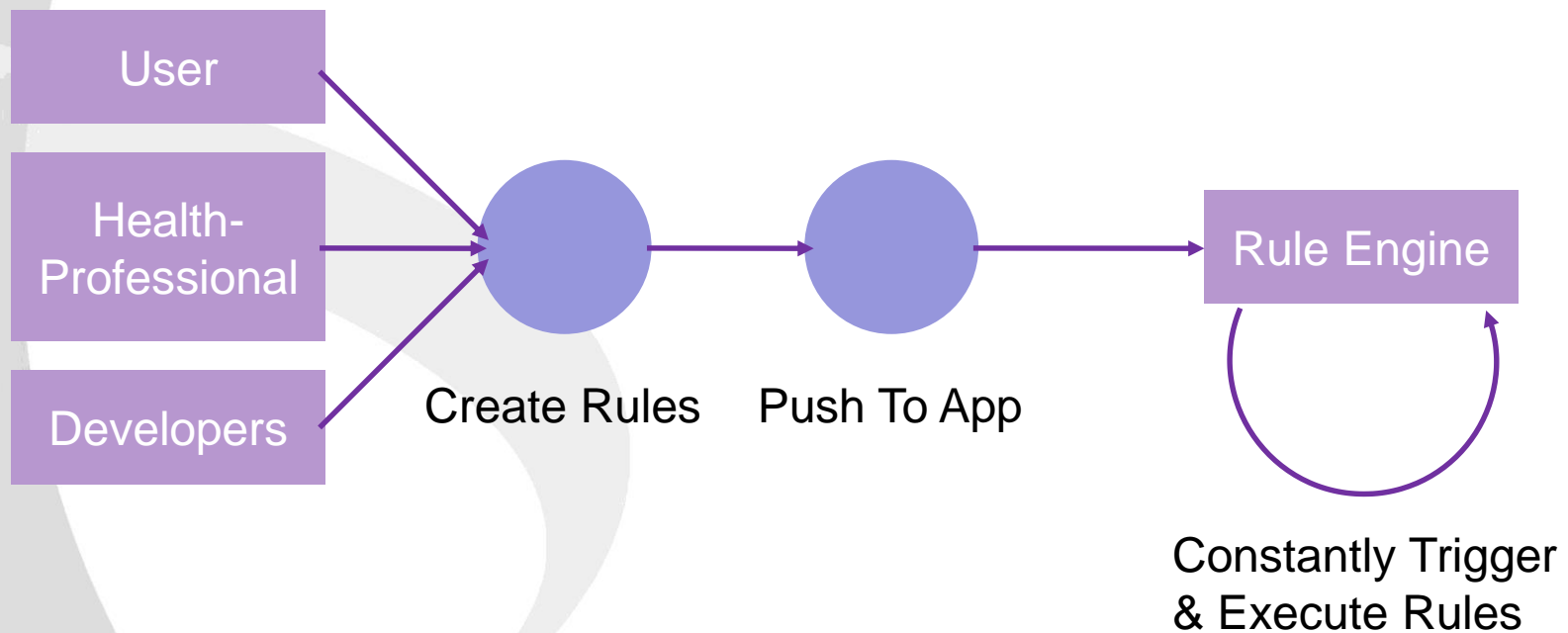


Rule and feedback system



Rule-System Overview

- **Generally:** a simplified tool to enable different stakeholders to alter runtime behaviour of the app and to improve effectivity and engagement



How does it work?

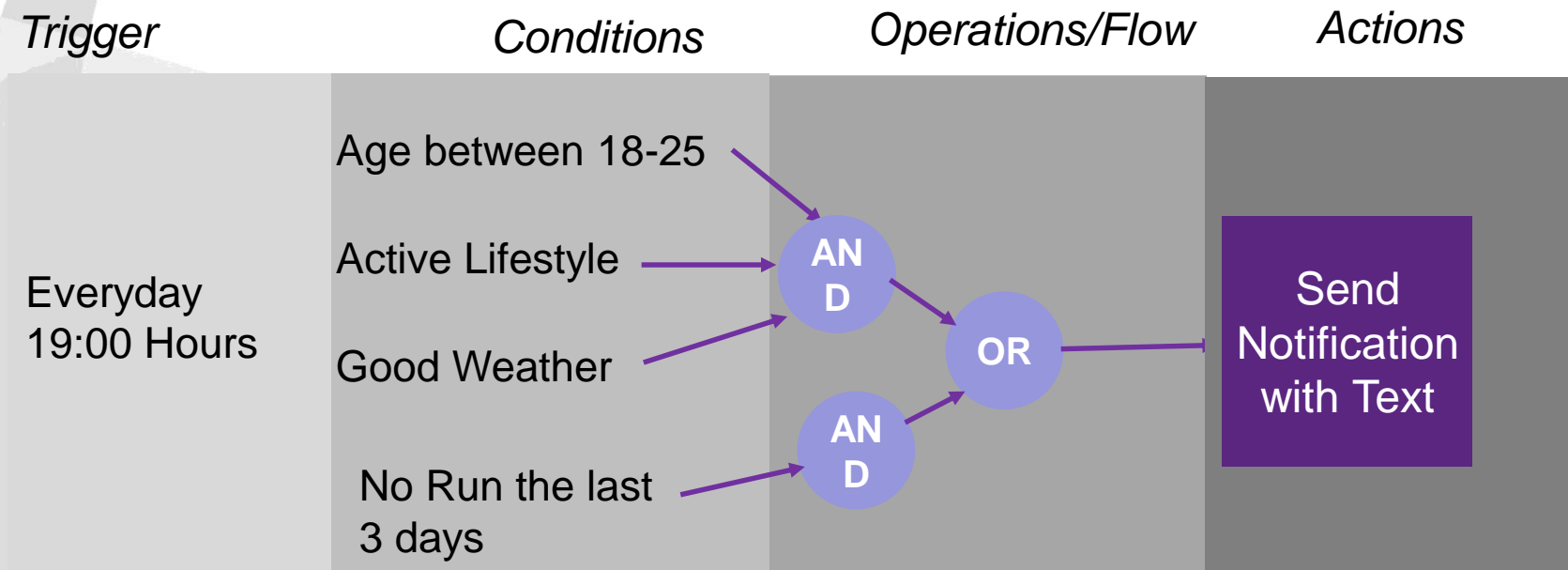
- **Triggers**
 - Define when rule is executed
 - Everyday at 6am, when a running activity was detected, when GPS information is available, etc.
- **Conditions**
 - Decide if an action should be performed
 - User is at home, user has cycle more than 1h yesterday, the room temperature is below 21°C, etc.
 - Logic operators
- **Actions**
 - Send notification, vibrate, execute another rule, recommend subapplication, etc.



What does a rule look like?

Scenario 1

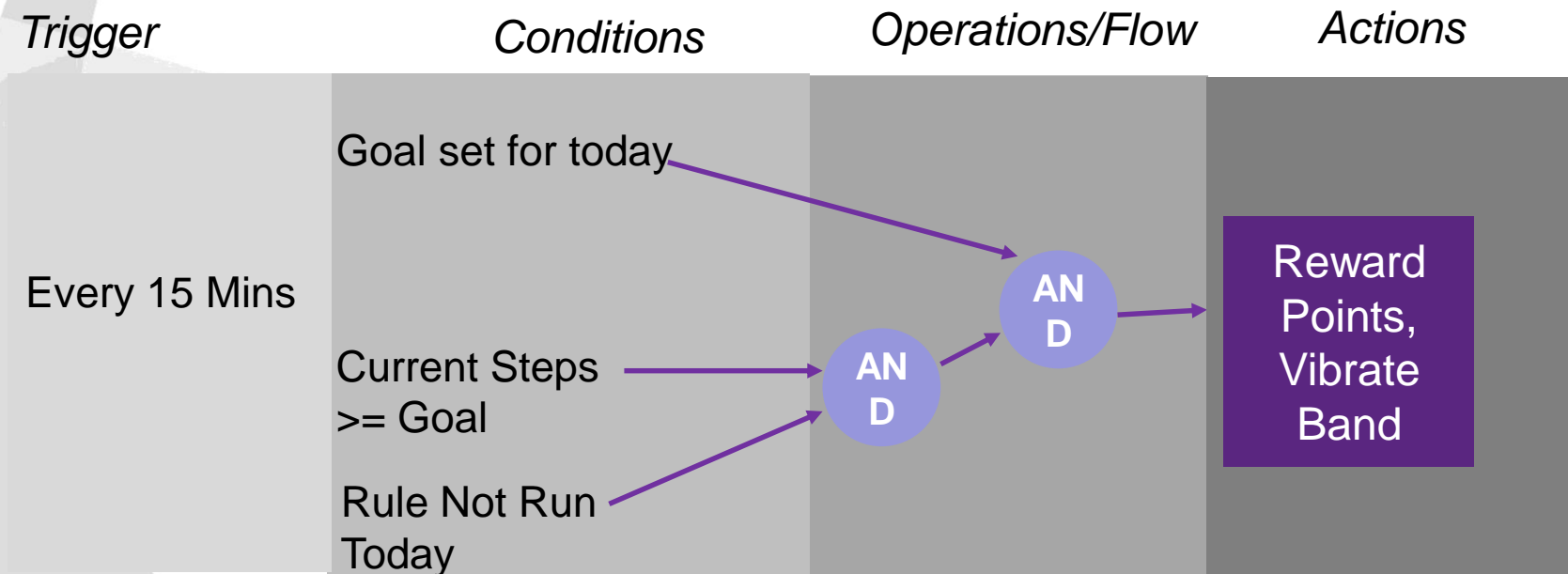
Motivational notification to targeted user group on a good weather day



What does a rule look like?

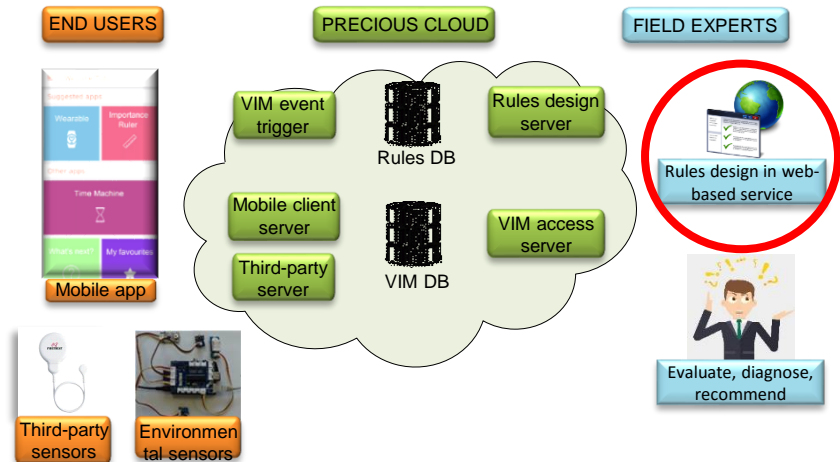
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Scenario 2
Reward points on goal achievement



Who creates the rules?


- T



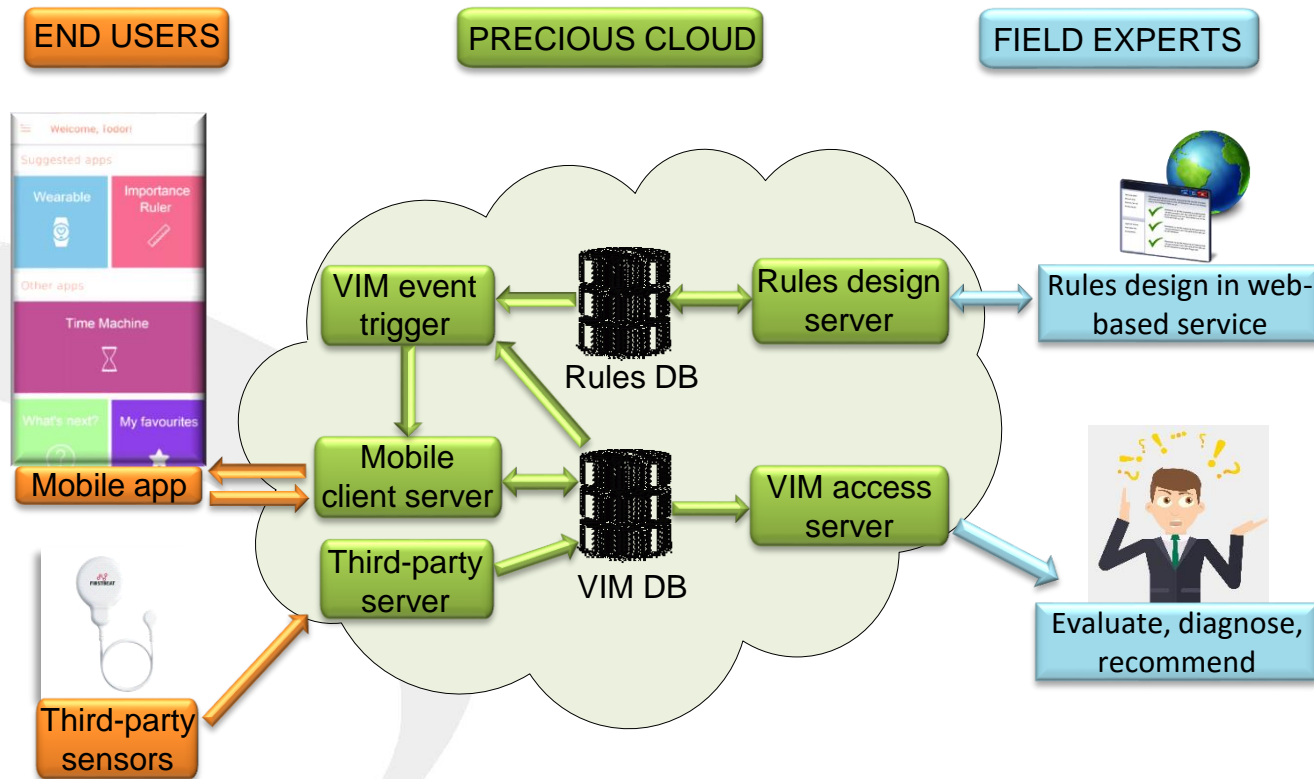
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Who has

- No user-specific
 - Encrypted
- In addition to HT
 - AES-256 b
 - Client and S
 - User-dat
 - Disabled
- Passwords only
- All backend insta
 - Difficult access

The European Union flag, featuring twelve yellow stars arranged in a circle on a blue background, is positioned in the bottom left corner of the slide.

Communication between entities



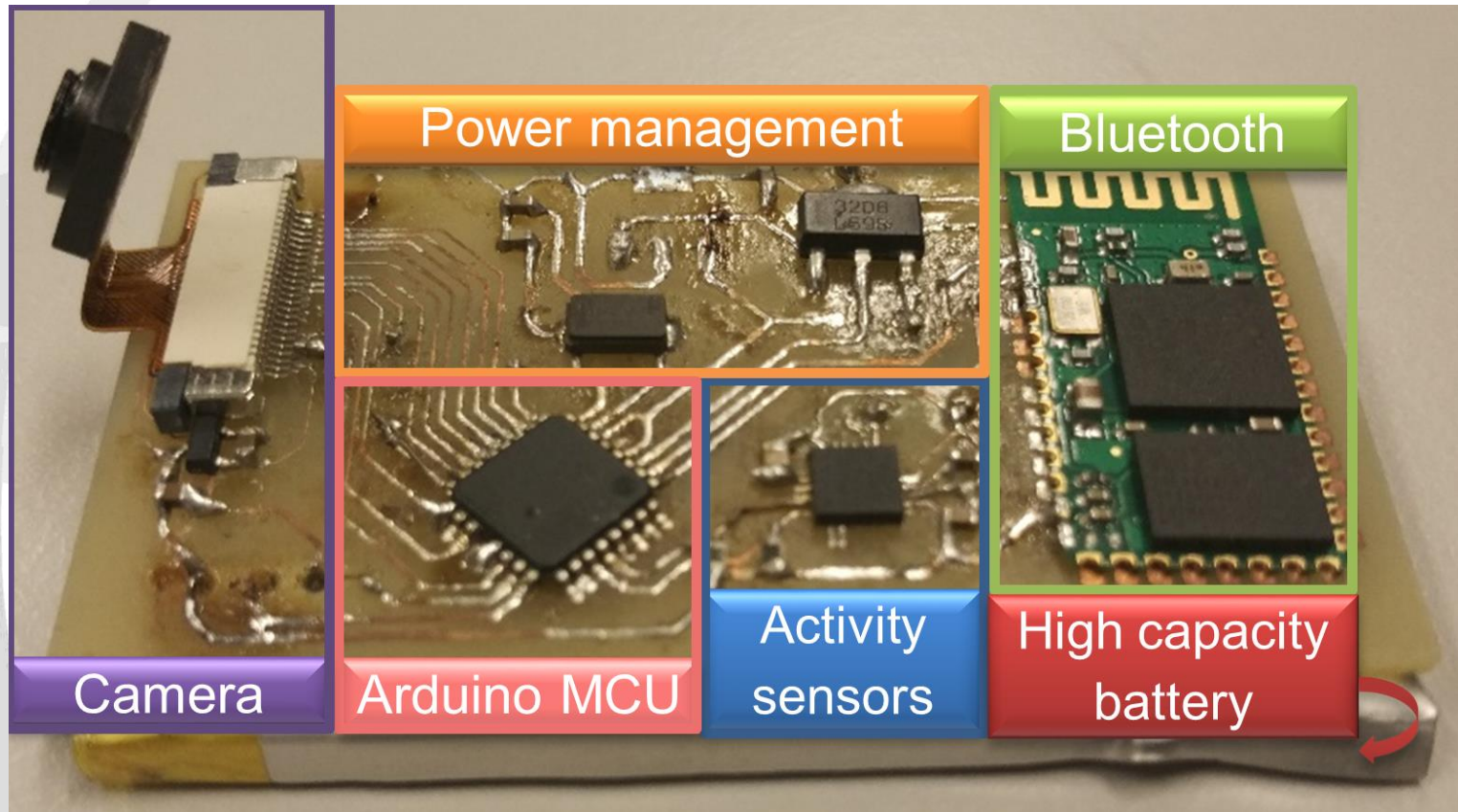
Future vision

- Precious wearable prototype
 - Open solution
 - Cheap
 - Fabricate at home
- Food recognition algorithm
 - 256 food classifier exists
 - Classify
 - It's a hamburger
 - Lack of proper image treatment



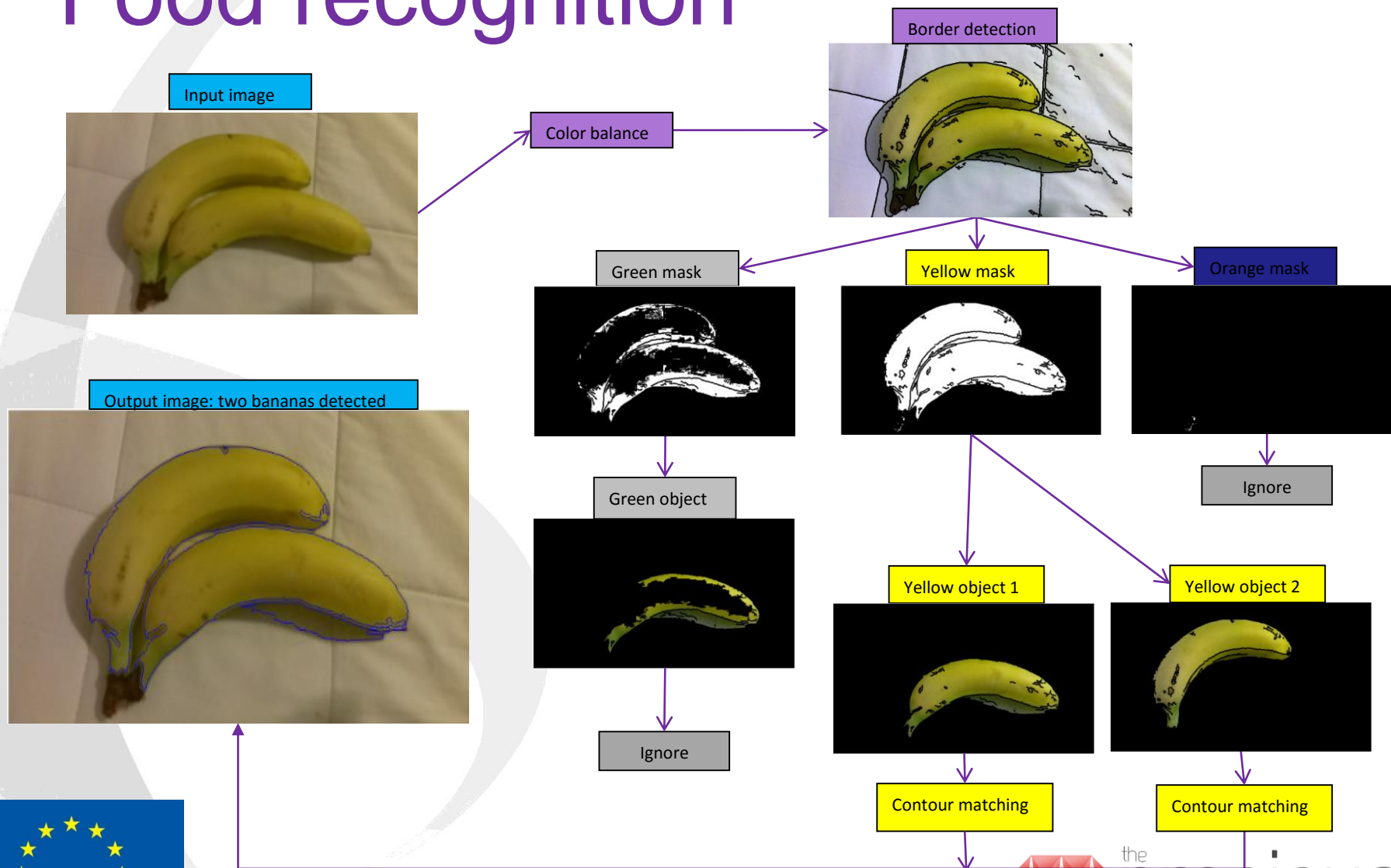
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Precious wearable



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Food recognition



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