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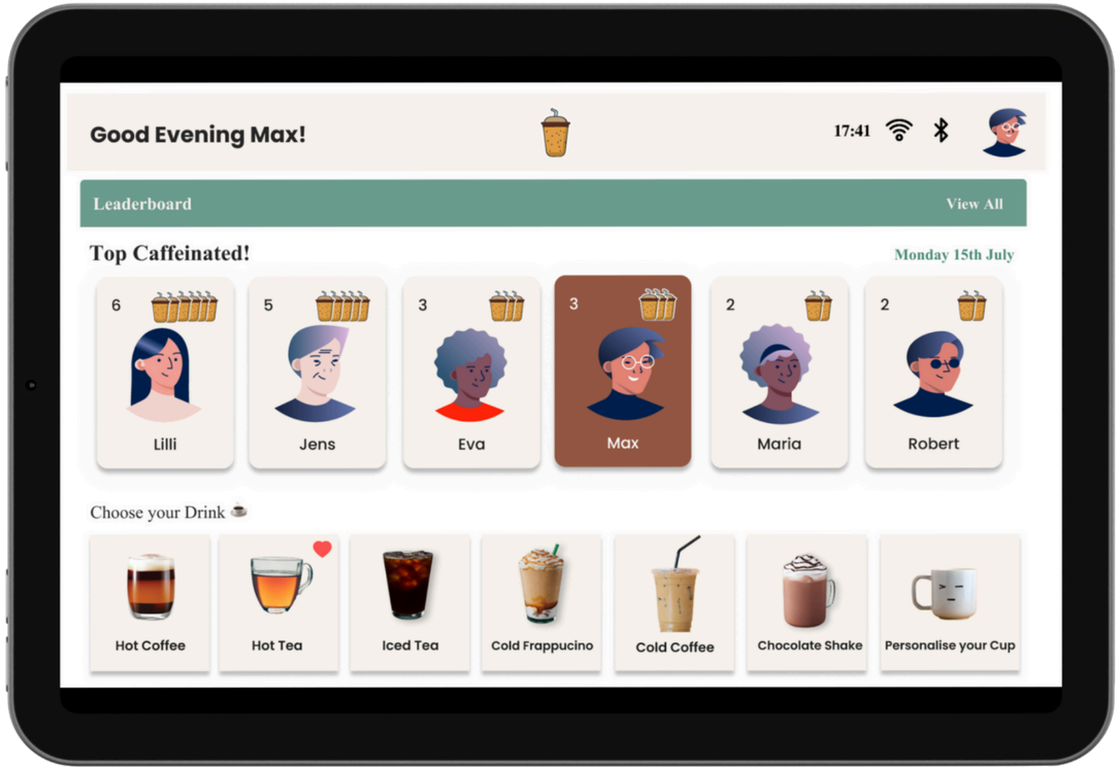
Ubiquitous Systems Lab
Volunteer Module

**UNIVERSITÄT SIEGEN**

# BrewView

# Smart Coffee Machine Interface



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# What Is BrewView?

BrewView is a smart interface for coffee machines, offering real-time visualization of brewing processes. With a user-friendly touchscreen, it lets users monitor the brewing process, ensuring a perfect cup of coffee every time. BrewView enhances the coffee-making experience with precision and control, ideal for coffee enthusiasts.


## WHY?

- Improving user interaction and control over coffee brewing.
- Enhancing coffee-making experiences through real-time monitoring.
- Empowering users with data-driven insights into their coffee preparation.

## TARGET USERS

Corporate Settings

# THREE MAIN PHASES

**Phase I -**

**Initial Setup of Previous Project Effort**

- Integrated the existing codebase with the ESP32 hardware, ensuring all components were correctly configured.
- Verified the connection between the coffee machine and the ESP32, ensuring that the machine responds to commands sent from the prototype.


**Phase II -**

**Bangle Watch and Mobile App**

- Test the integration of the Bangle Watch and its Bluetooth connectivity to ensure it can send commands accurately to the coffee machine.
- Prototyped the 'BrewView' mobile app with a user-friendly interface, allowing users to control the coffee machine via their smartphones.

**Phase III -**

**Final Interface on Coffee Machine**

- Designed an intuitive and visually appealing interface screen (iPad) mounted above the coffee machine, known as 'BrewView'.
- Integrated all the necessary features based on the Bangle js app and also added new features, such as a drink leaderboard, into the interface, providing valuable insights to users.

# Quick Process Flow



### Setting up Espruino Dashboard

Configured the Espruino dashboard for managing and interacting with connected devices, ensuring all settings are correctly initialized.

### Initializing the Code in Espruino IDE

Load and initialize the project code within the Espruino IDE to prepare it for execution on the Bangle Watch.

1 2 3 4 5

### Setting up Arduino Code

Upload the Arduino code to the ESP32 Arduino board to manage communication and control with the coffee machine.

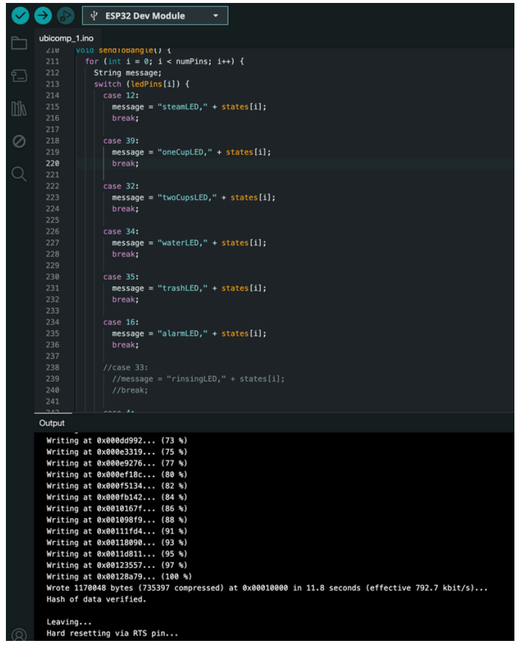
### Connecting Bangle Watch the Espruino Dashboard

Pair the Bangle Watch with the Espruino dashboard to enable the initialization and control of the app on the watch.

### Running the BEL.JS App on Espruino IDE

Execute the BEL.JS app within the Espruino IDE, activating the application on the Bangle Watch to enable interaction with the coffee machine.

1

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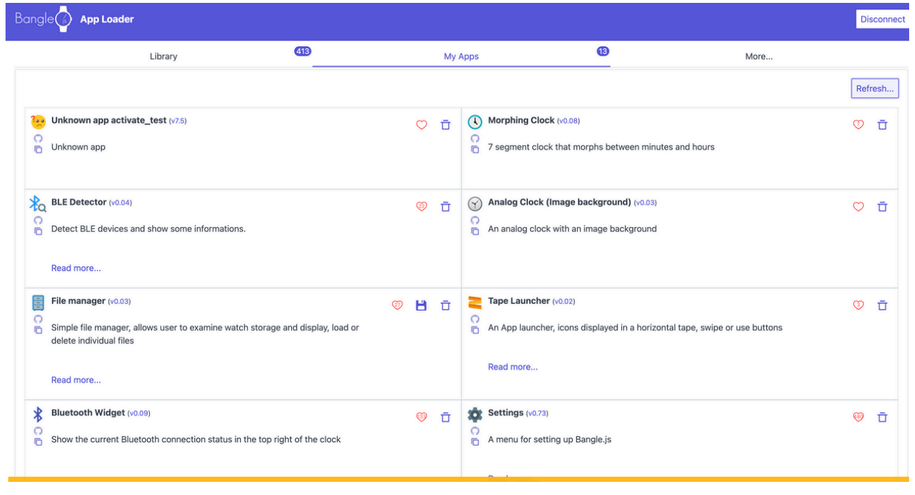


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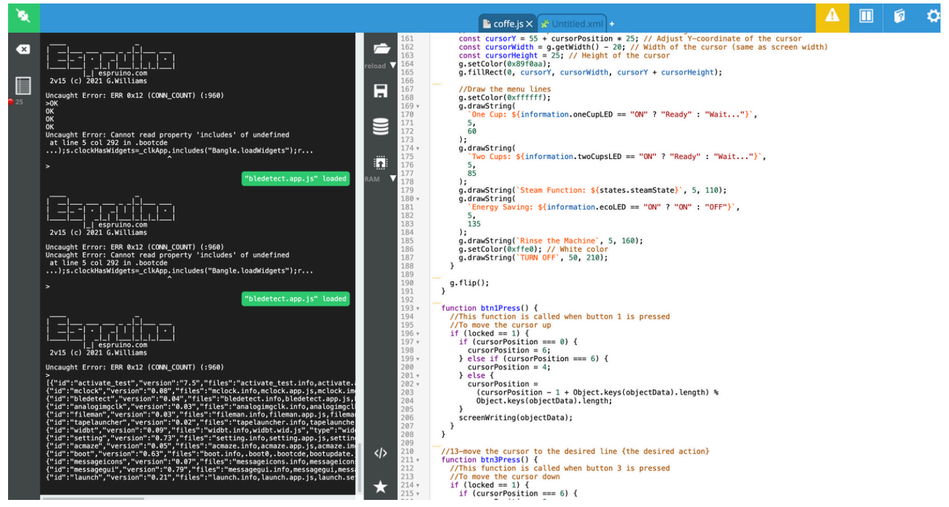


# PHASE III - INTERFACE PROTOTYPE SETUP

# WELCOME

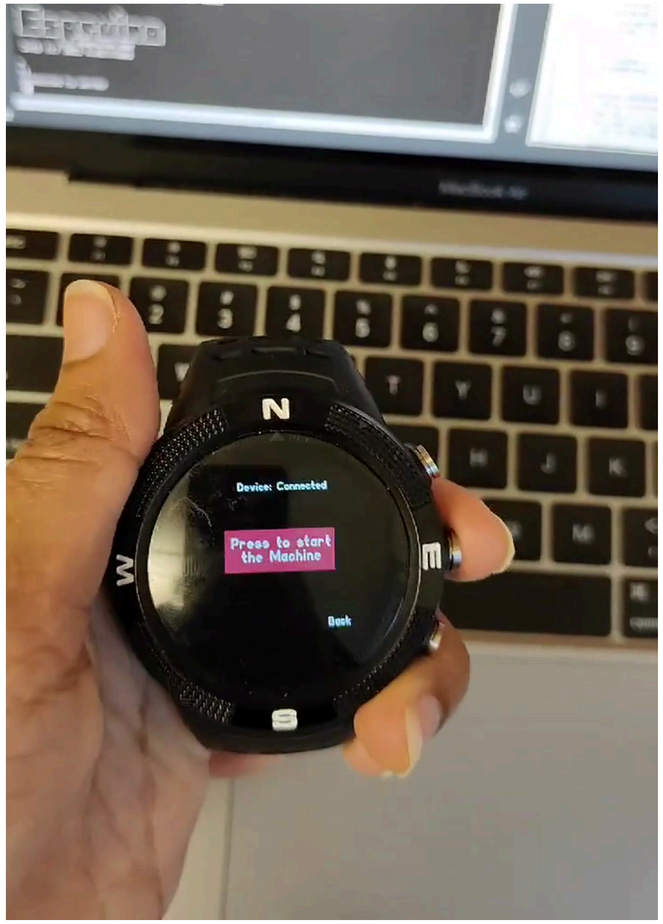

Welcome to BrewView, the coffee machine interfa

# LET’S SUMMARIZE IT

# Use Case 1- Bangle Watch Connectivity

Process Flow Summary

Max, the user, interacts with the coffee machine through a bangle watch connected via Bluetooth. The interactive interface embedded on top of the coffee machine allows Max to initiate the brewing process remotely from the convenience of his watch.

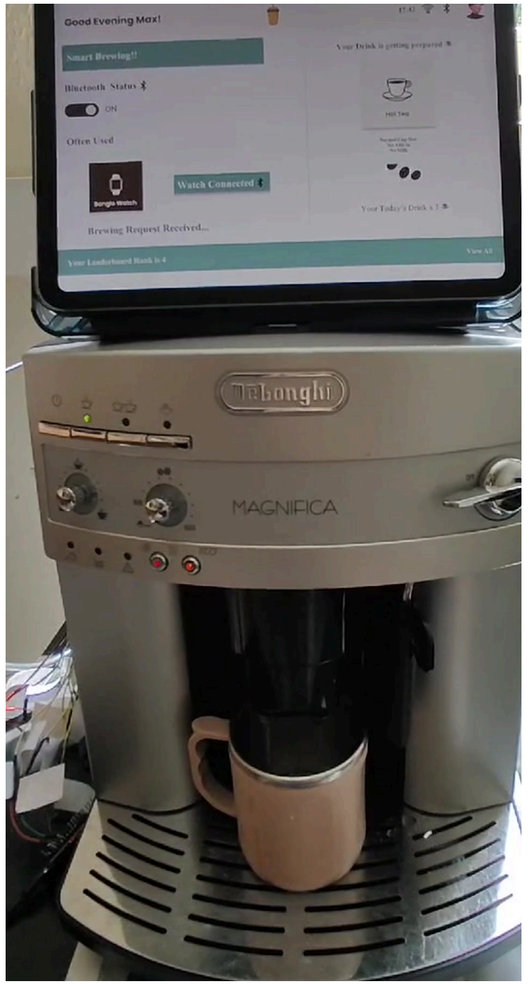



**Brewing Request**

Bluetooth

**Acknowledgement Message**

**Notification Message**



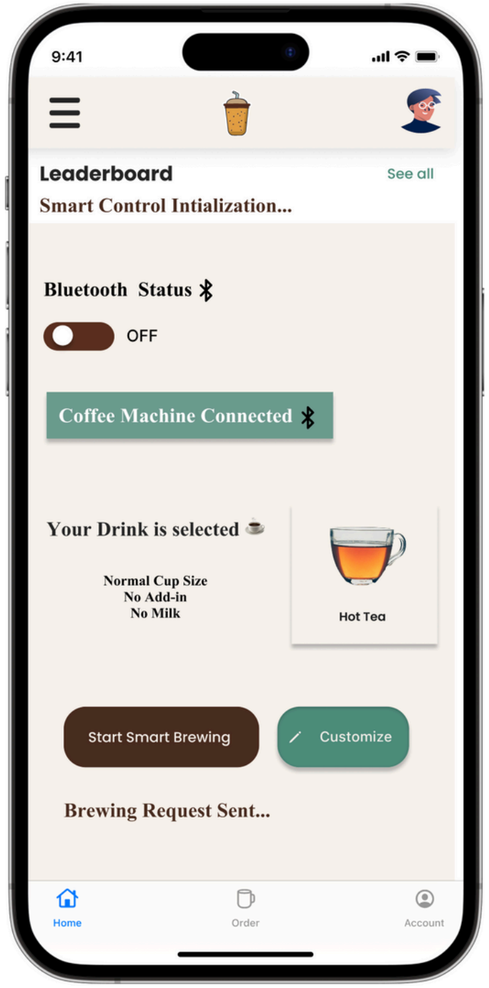

**Ubiquitous Control**
Remote Coffee Brewing

**HCI Notion**
Seamless User Experience

# Use Case 2- Mobile App Connectivity

Process Flow Summary

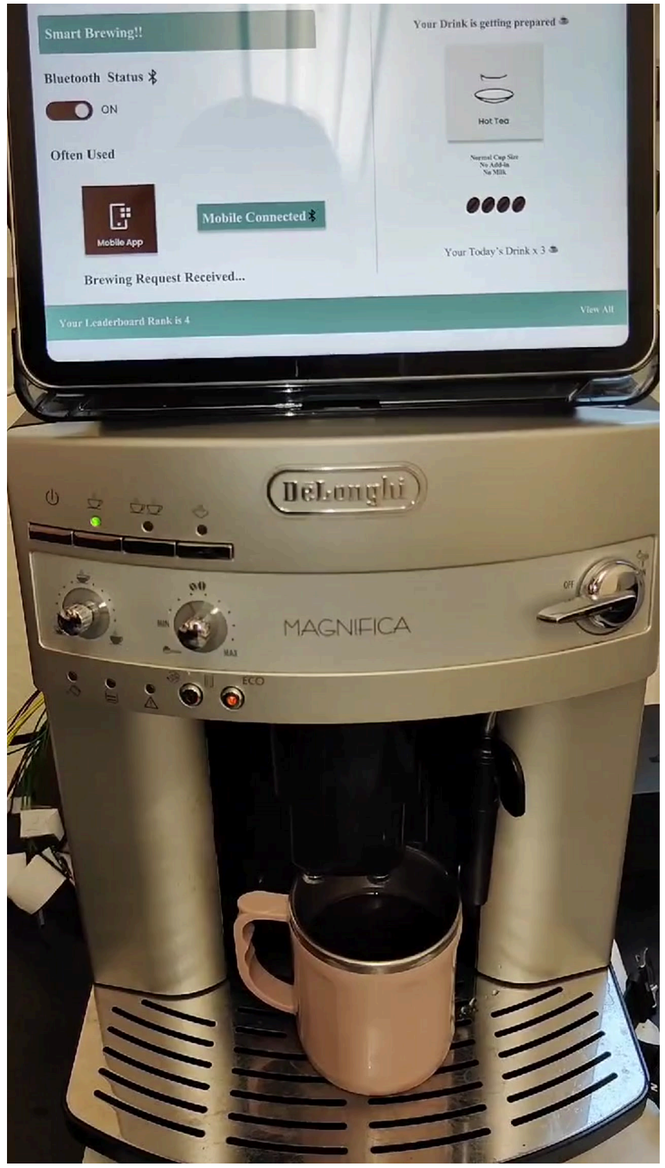
Max uses a mobile application connected via Bluetooth to interact with the coffee machine. The interactive interface on the machine enables Max to send brewing commands directly from the app, triggering the smart brewing functionality.




**Brewing Request**

Bluetooth

**Acknowledgement Message**
**Notification Message**

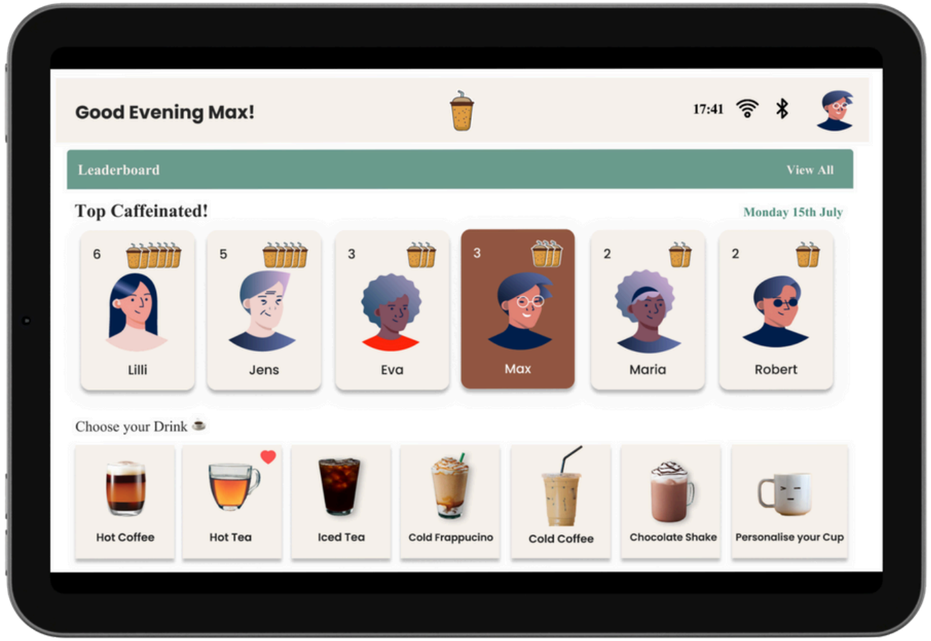



**Ubiquitous Control**
Convenient Coffee Access

**HCI Notion**
Intuitive App Control

# Prototype Main Components

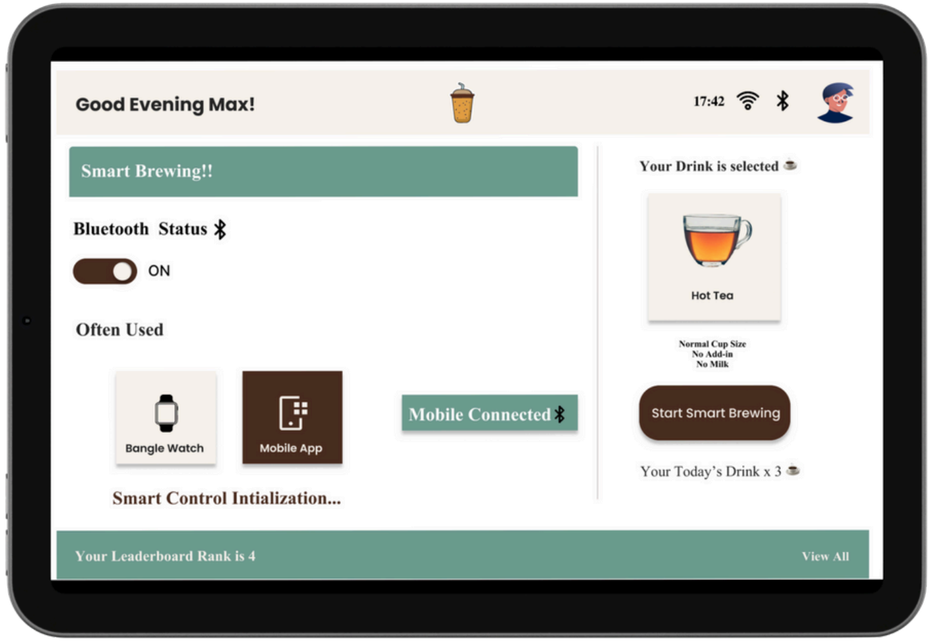





## Leaderboard

- **Real-Time Data Visualization and Ubiquitous Access-**
  This real-time access, facilitated through ubiquitous computing technologies, allows users to view the performance of their peers from any connected device.

- **Data-Driven Insights-**
  The seamless integration of data analytics into the user interface exemplifies ubiquitous computing, where technology enhances everyday experiences through intelligent data utilization.




## Smart Brewing

- **Bluetooth Connectivity Options-**
  Enable users to control the coffee machine. This demonstrates the essence of ubiquitous computing by providing an integrated and context-aware environment where the coffee machine interacts effortlessly with multiple devices.

- **Context-Aware Computing-**
  The prototype enables users to remotely customize and initiate the brewing process, showcasing how everyday objects like the coffee machine can embody ubiquitous computing. This integration makes the device intelligent and responsive, adapting to user preferences and changing contexts seamlessly.

# TOPICS ADDRESSED



01/
Smart Computing
Device Integration

02/
User-Centric
Interface

03/
Remote
Accessibility

04/
Interoperability

05/
Enhanced Experience

# Questions & Feedback

# Thank You

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**Human-Computer Interaction (HCI)**