Table 3.4: Concept Boundary Interfaces

Interface	Description	Type
1	Power Delivery to Platform	Electrical Energy
2	BLE with FTMS implementation	Communication Info
3	User Inputs and Feedback to User	User Info
4	Resistance Applied to Bicycle	Energy Losses
5	Sensor Readings of Cycling Data	Sensor Info

2: BLE with FTMS implementation

It was decided to keep the platform completely separate from the device that will be running the Zwift application, as this will allow th platform to easily be used by any other device without requiring any additional modifications.BLE was chosen as the communication protocol as this is what is available on most consumer electronic devices that Zwift is expected to operate on, and will thus not need an external unit to communicate with the platform.

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In order to meet the requirements specified above, a *roller trainer* was identified as the platform that would achieve the most desirable outcome. Roller trainers would allow for use with any existing bicycle configuration and a wider range of wheel diameters and wheelbases, without requiring the cyclist to buy or attach any additional components. The solution does however add some complexity to the use of the platform, as it requires additional skill and experience in order to efficiently use roller trainer platforms.

The resistance of the platform will be controlled by an ECB, as this would allow for repeatable and frictionless braking torque applied to the rear roller of the trainer. This will accurately simulate outside rolling conditions, as smooth acceleration would be required at high braking torques to avoid the bicycle wheel slipping, similar to what would happen in outside riding conditions.