Redback Operations

Data Science and Analytics Team

M.TELLEY

DOCUMENTATION

Dashboard

Live link, Deakin access only:
https://datastudio.google.com/reporting/72bf3538-2b54-4ab7-95a7-c8517cc449e7 \

Purpose

Redback Operation core product will collect performance (output) data from several sensors while the user is using the bike and wahoo kickr trainer. Moreover, establishing a working environment that will align with the core product is critical in establishing continuity in data-related tasks and advising other core teams about Data Science and Analytics (DSA) Team's requirements. The initial effort is to set up a core data location for the team that house all key datasets.

By the end of this task, further work on data analysis and the use of several machine-learning algorithms will be possible.

Scope

Once the data is correctly formatted and processed in Bigqquery, set up, design and develop a prototype Google Looker Studio dashboard that visualises a User's workout data (by single session). The outcome of this work will further inform future efforts to provide a post-workout analysis to Users once they have finished their session on the bike.

Google Looker Studio

What is Looker Studio?

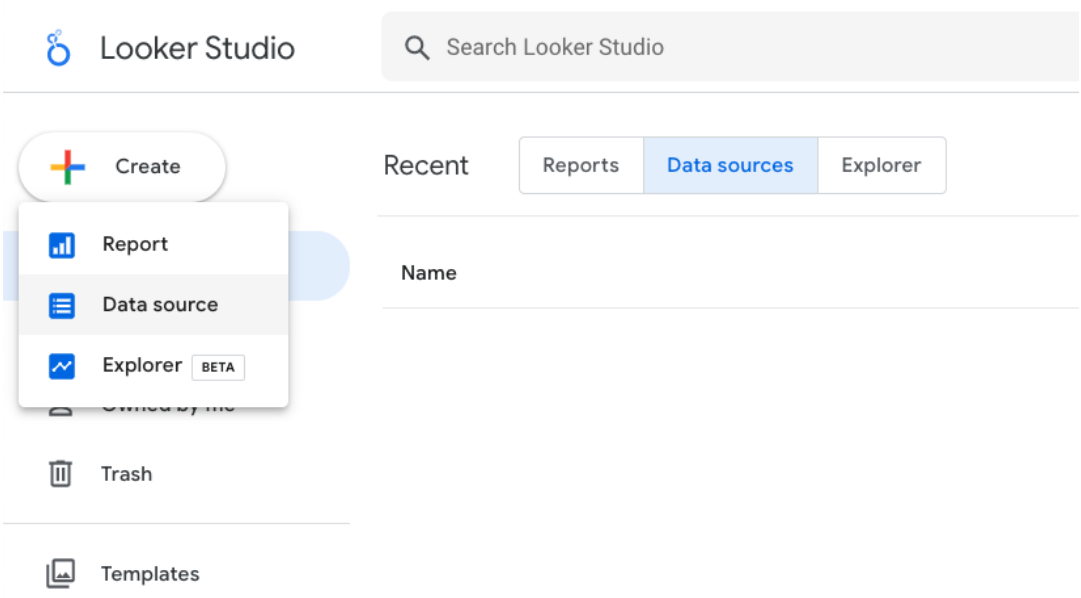
Looker Studio is a free tool that turns data into informative, easy-to-read, easy-to-share, and fully customisable dashboards and reports. Google Looker Studio can:

- Tell a data story with charts, including line, bar, and pie charts, geo maps, area and bubble graphs, paginated data tables, pivot tables, and more.
- Makes reports interactive with viewer filters and date range controls. The data control turns any report into a flexible template report that anyone can use to see their own data.
- Include links and clickable images to create product catalogues, video libraries, and other hyperlinked content.
- Annotate and brand reports with text and images.
- Apply styles and colour themes that make data stories works of data visualisation art.

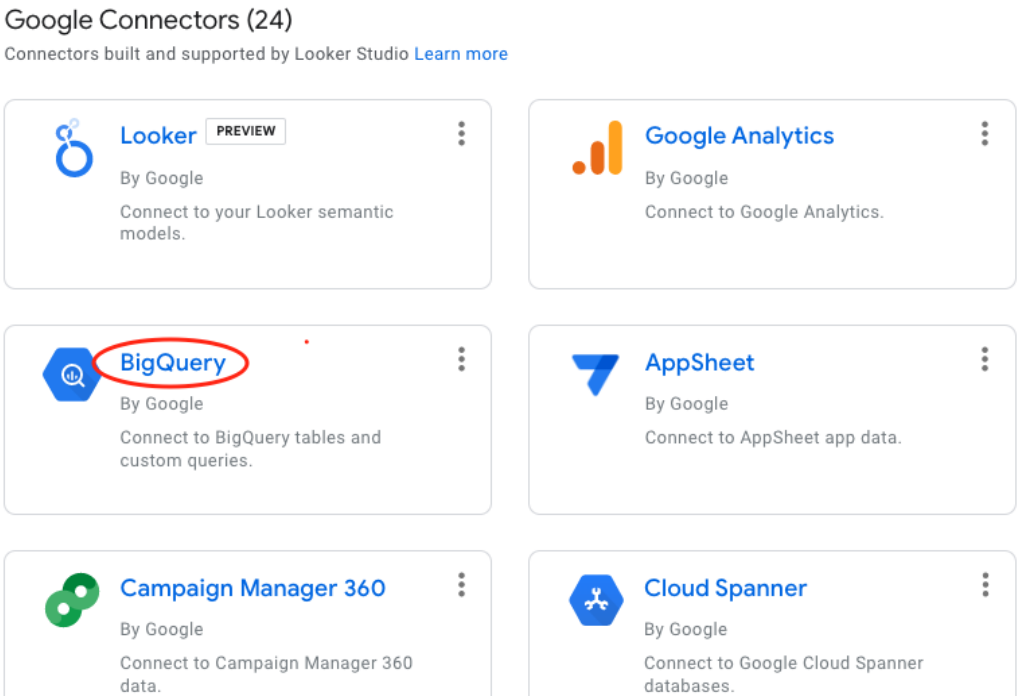
Google Support

How is Looker Studio Used?

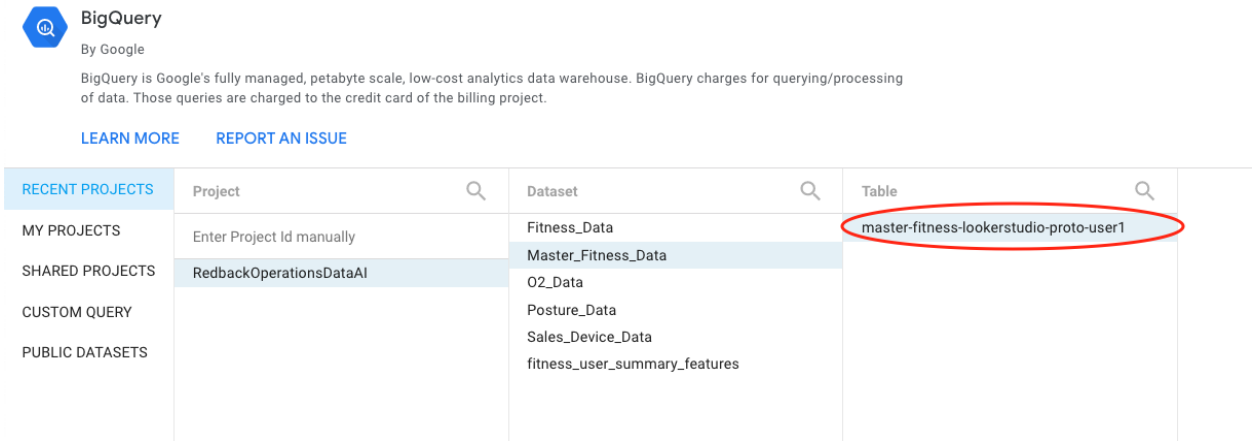
Once the data table is set up in BigQuery, a data source connection is set up in Looker Studio:



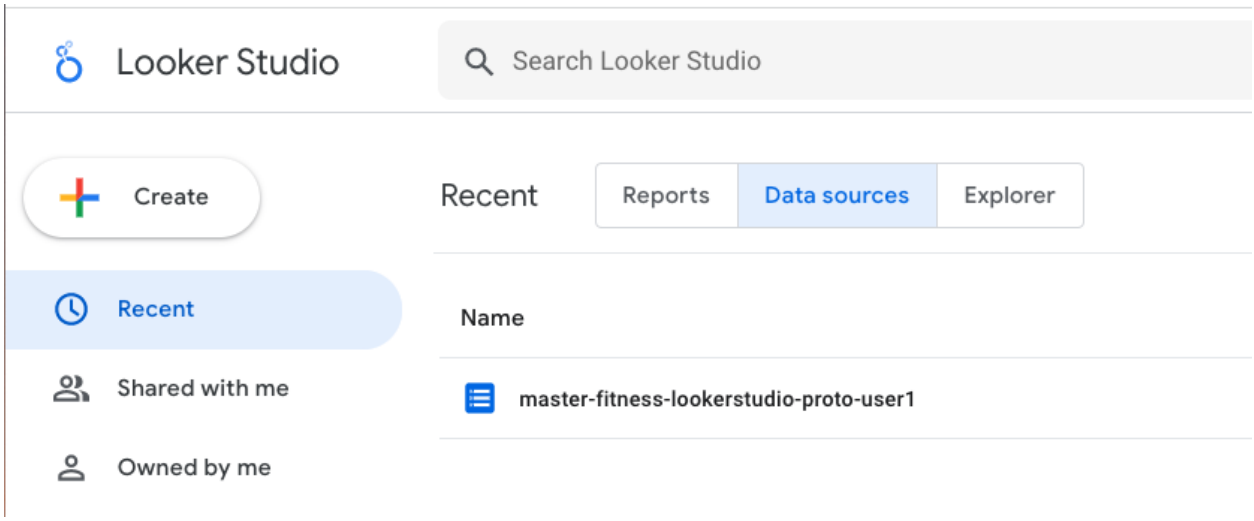
Bigquery is then selected:



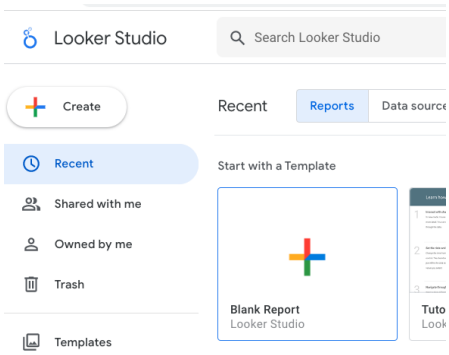
Select the correct data table:



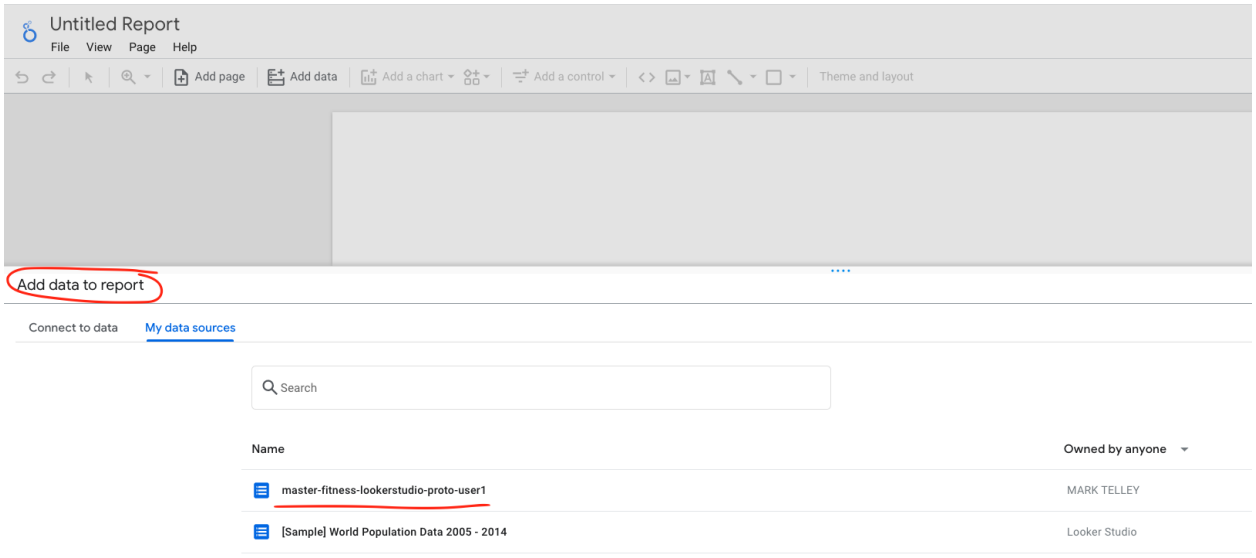
The data source is now available:



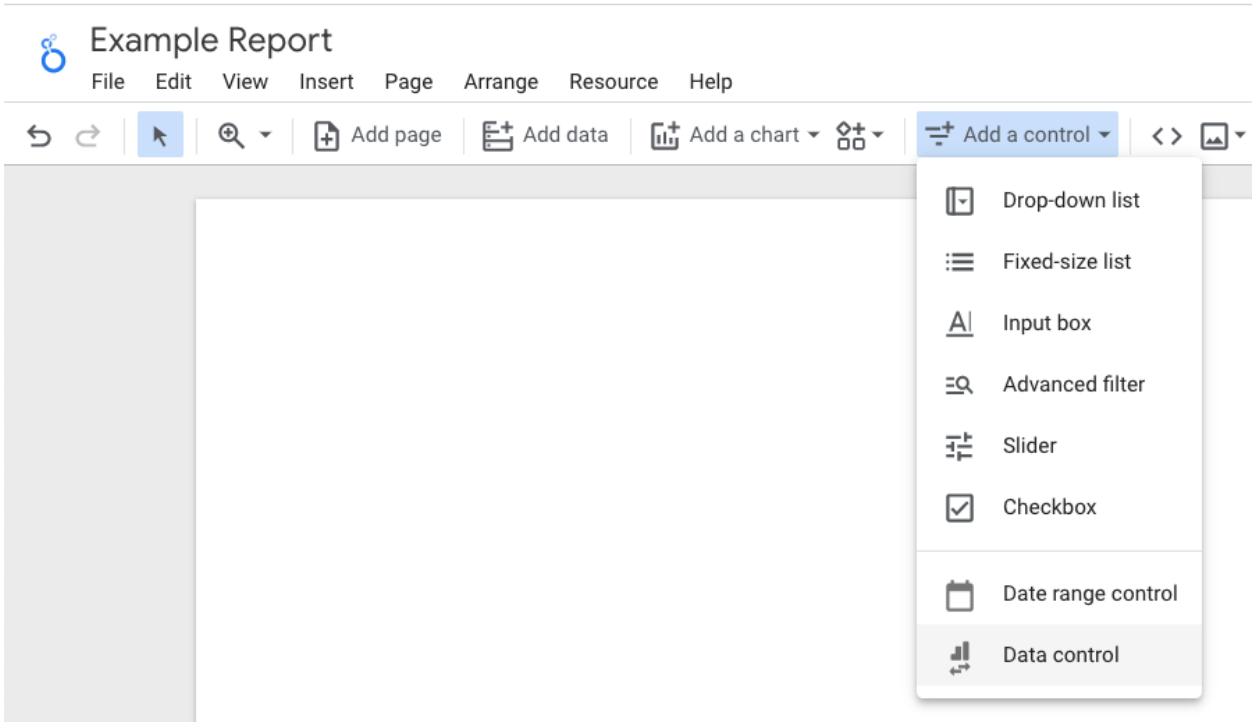
The next step is to build a report by clicking on “Blank Report”. Alternatively, templates can be used, however, for this exercise, a blank report is selected:

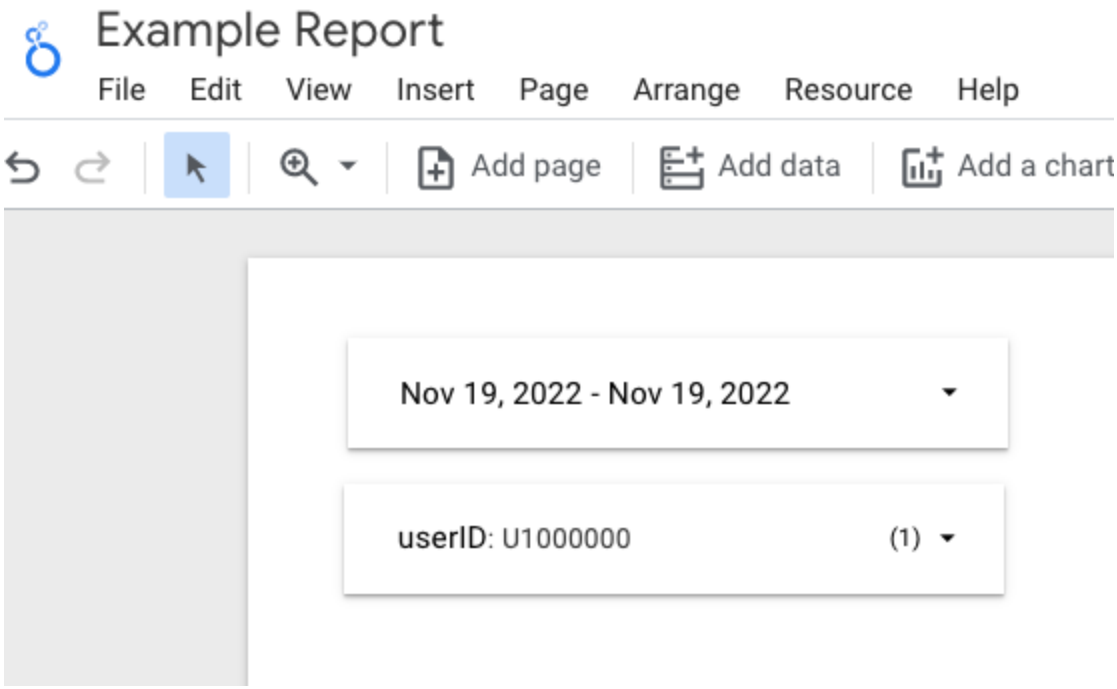


Once the report is initialised, Looker will prompt for a data source - and here, we can see the newly created data sources under “my data sources”:



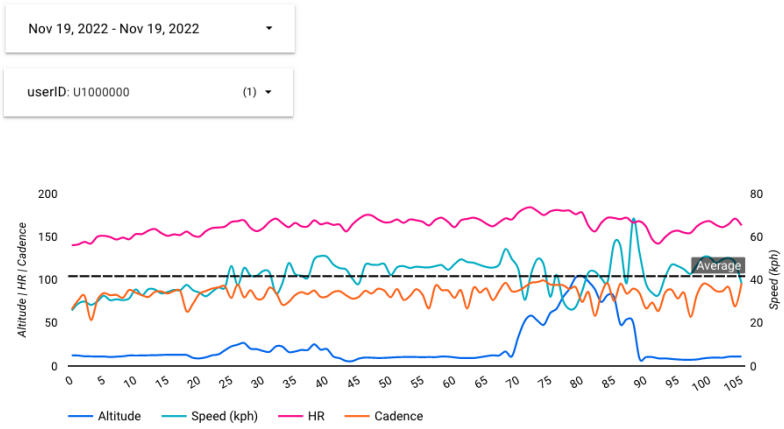
From here, a few data controls are used by dragging them into the report envelope. Date control and userID drop-down list are selected. Moreover, date range control properties are updated along with drop-downlist properties are updated; the date is set as the 19th of November as the target date and userID is set as U1000000





From there, data charts are added to the report:

1. A time series/line showing altitude and speed:
2. A few summary statistics



Total Climbing	Av Power	Av Power*	Av Heart Rate
231	214.35	223.43	158.91
Max Grade	**FTP %**	**Std Power**	**Std Heart Rate**
10.22	71.21%	125.5	11.08
Av Grade	**Av Watts per Kg**	**Max Power**	**Av % max Heart Rate**
0.18	2.68	763	83.69%

Research - User Interface Design

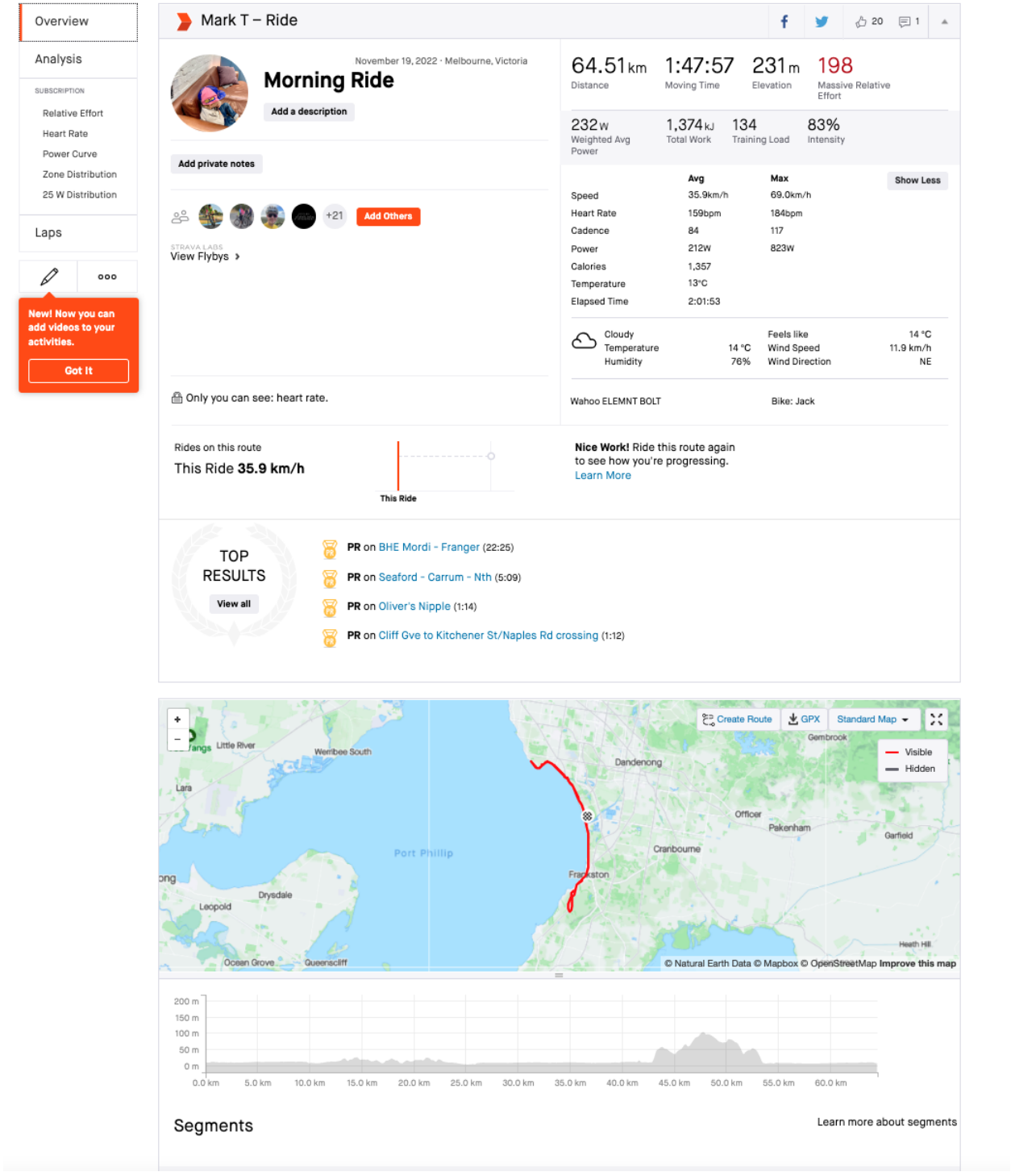
Three key business/platforms were used to inform User Interface Design i.e., what the report actually looks like, there are:

1. Strava
2. Wahoo

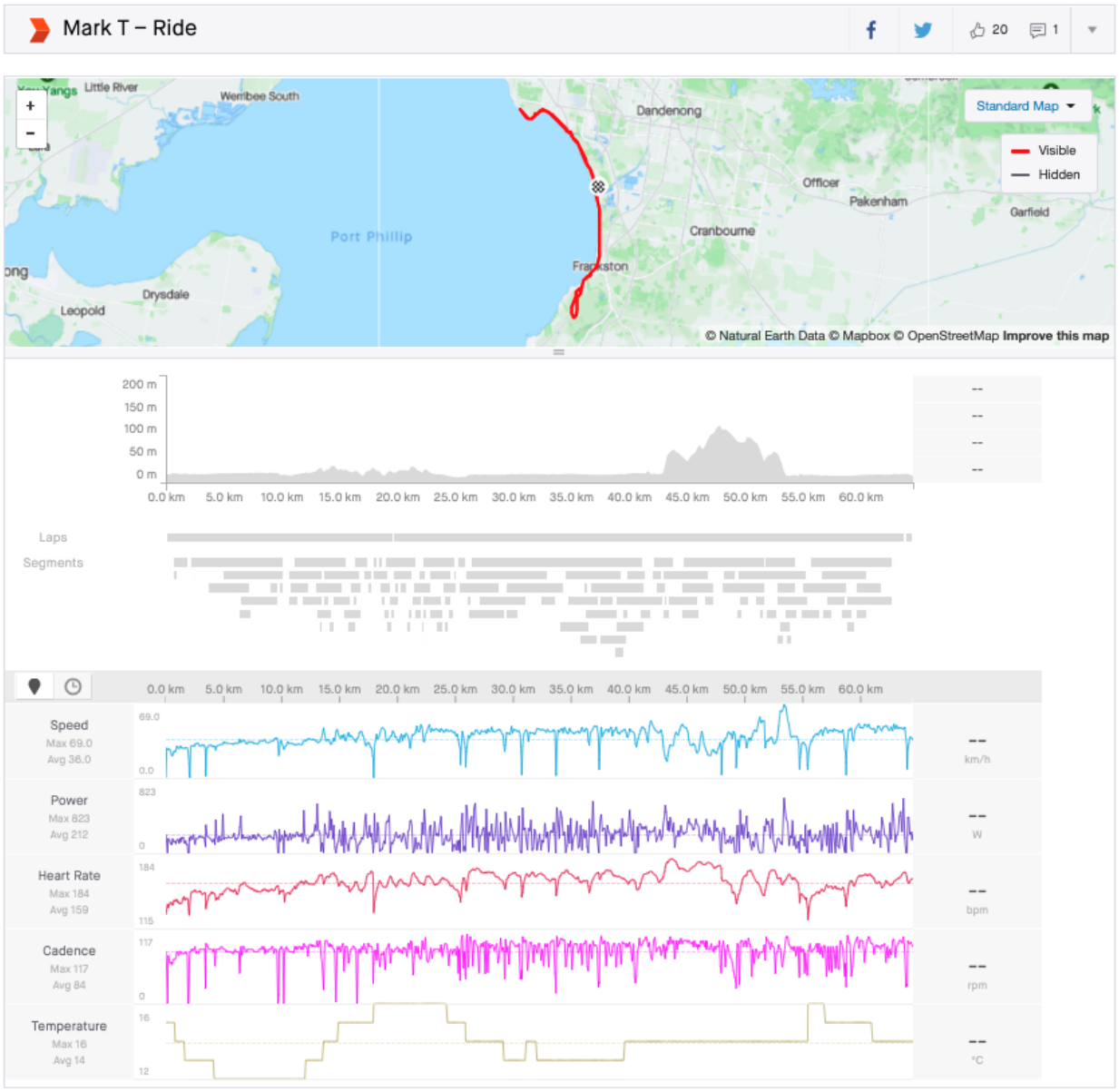
Strava

Strava is a widely used fitness social media app that records workout data along with several other data points. Moreover, Strava provides ‘Overview’ and ‘Analysis dashboards via their web app, see next page

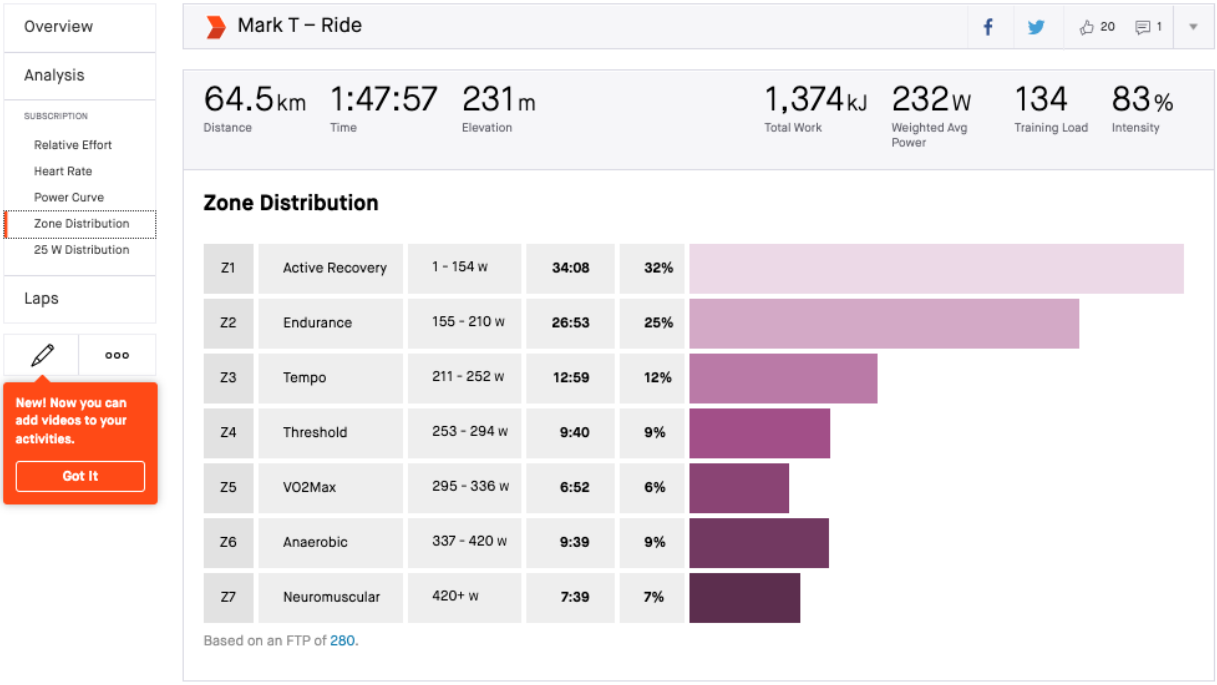
Overview: *Provided by M.Telley*



Analysis: *Provided by M.Telley*



Zone Distribution: *Provided by M.Telley*



Many of the features in the Strava dashboards were evaluated for implementation within the prototype dashboard. These were:

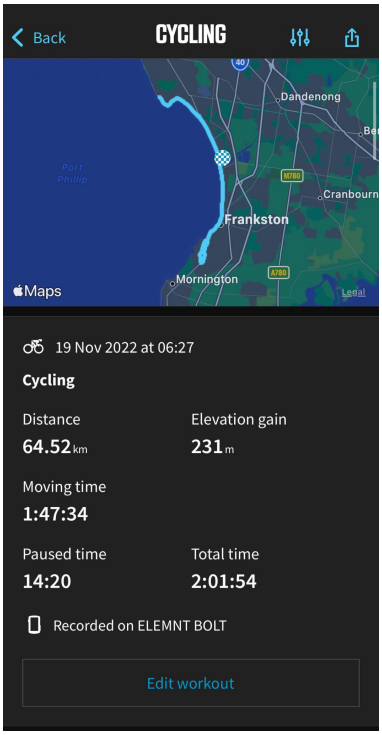
1. Zone distribution.
2. Timeseries chart showing power, altitude, speed etc
3. Summary Statistics

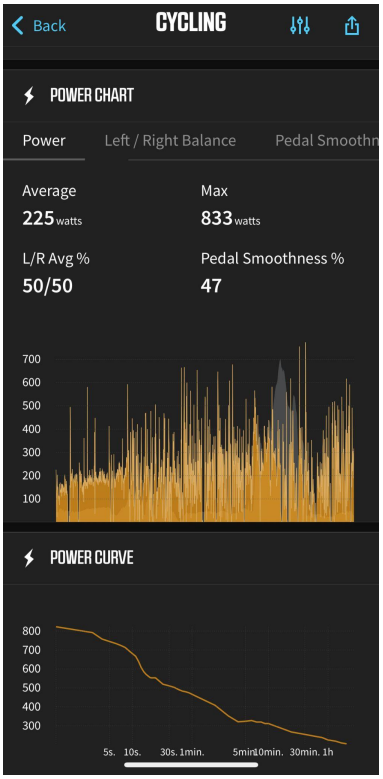
Wahoo

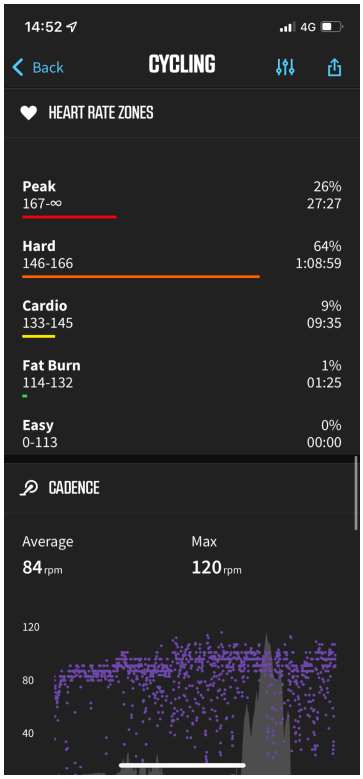
As listed on wahoo.com,
'*Founded in 2009 by Chip Hawkins in Atlanta, GA, Wahoo creates innovative solutions to make hard-fought goals attainable and lives better. Wahoo was built on the foundation of simplicity and the mindset that "there's got to be a better way.'*

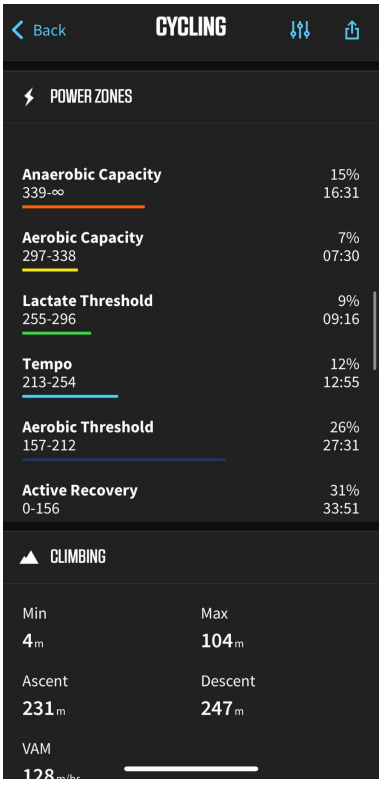
Wahoo manufactures a range of exercise-related hardware and software, some of which are used by Redback Operations i.e. Wahoo Kickr. Moreover, Wahoo has developed a world-class software application called "Element" which is available both on iOS and Android devices that summarises the user's workout data.

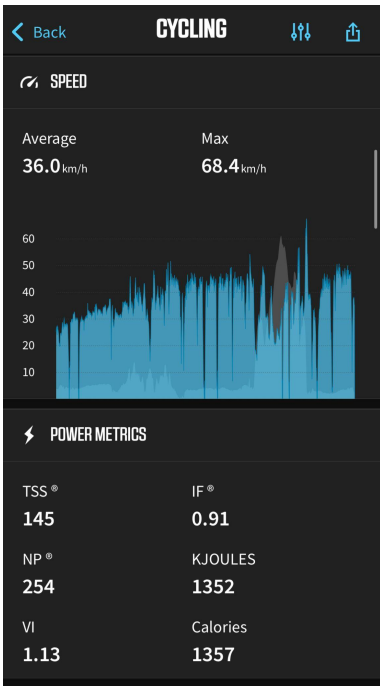
Interface Examples: *Provided by M.Telley*

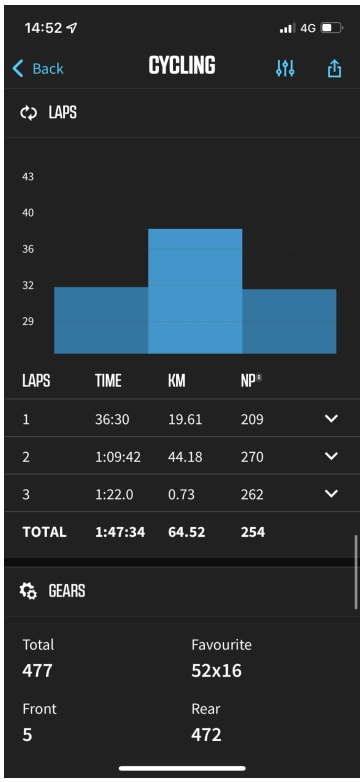












Similar to Strava, many of the features in the Wahoo dashboards were evaluated for implementation within the prototype dashboard. These were:

4. Zone distribution.
5. Timeseries chart showing power, altitude, speed etc
6. Summary Statistics

Implementation and Design Process

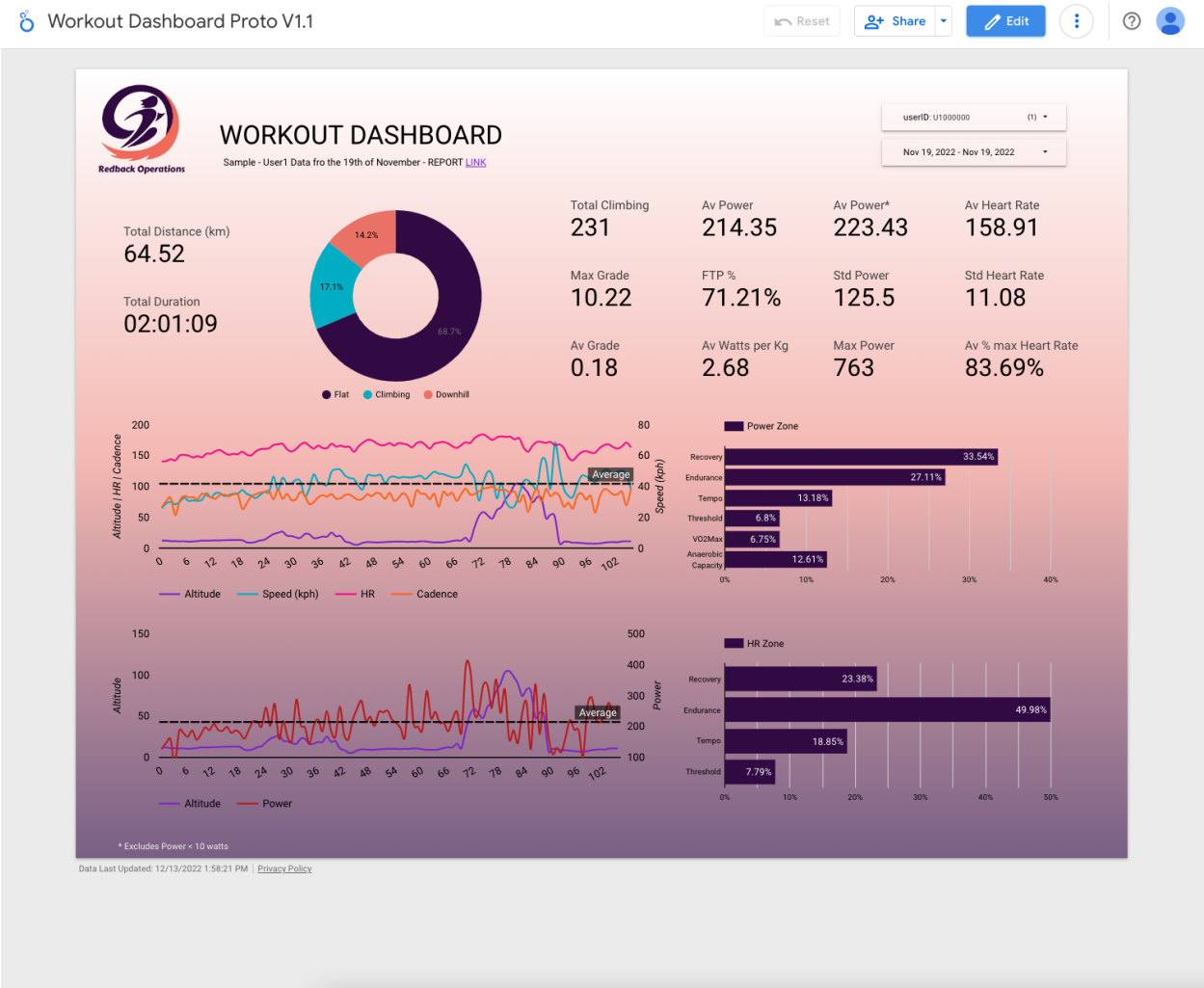
Based on the competitor research, a pathway to developing a minimal viable product was established - Three key data views or charts were targeted initially. Moreover, it was clear that certain features would require additional time to develop or wouldn't immediately be possible due to privacy concerns such as but not limited to

1. Map visibility (privacy concerns)
2. Total 'moving time'
3. Total 'pause time'
4. Total work (kJ)
5. Weighted Avg Power
6. Weather data
7. Intensity
8. Training Load
9. Gearing details
10. Certain Climbing details
11. L/R Balance

Some of the features above could be explored in proceeding trimesters.

Final Product (MVP)

After development, along with the inclusion of additional data points such as “zone category”, and “heart rate category” as a means of establishing bins for the bar charts, the dashboard was complete



Conclusion

By undertaking thorough research of competitor products, and reviewing the various data points, chart types, and data visualisations the MVP dashboard “Prototype 1” was completed. The final product while still very basic mimics reports available in the market and offers an example for other teams with Redback Operations about what is possible concerning the availability of data points and how that translates into a user-friendly and concise dashboard concerning workout analysis. The report has a huge runway for further refinement and development over the proceeding trimesters.