

Data Science Project: Final Project Report

Basketball Victoria - Data Organisation and Dashboard

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Acknowledgement of Country

RMIT University acknowledges the people of the Woi Wurrung and Boon Wurrung language groups of the Eastern Kulin Nation, on whose unceded lands we conduct the business of the University. RMIT University respectfully acknowledges their Ancestors and Elders, past and present. RMIT also acknowledges the Traditional Custodians and their Ancestors of the lands and waters across Australia where we conduct our business.

Introduction

Basketball Victoria is the peak governing body for basketball within Victoria. This organisation oversees a wide range of competitions, development programs and the large scale of community engagement initiatives that occur throughout the state. The tens of thousands of participants that have already participated in the sport and the many more that will continue to join in the future, combined with the ever-growing number of games played through the season, has left basketball Victoria with an excessive volume of data including player statistics, game results and league progression.

The main goal of the project is to help Basketball Victoria in helping build an interactive web dashboard that allows many users such as players, coaches, and fans to search, filter and visualise individual and team statistics across multiple seasons. By enabling public access to this type of data, the tool will assist in celebrating scores, awards, and achievements, enhancing engagement and support data driven insights for coaching and development purposes.

From the beginning, the group has decided to use a practical and iterative approach, guided by the Kanban methodology. The system was developed using Streamlit, which is a python-based web framework that allows for fast prototyping and deployment of interactive dashboards. Streamlit's integration with Pandas, enabled the group to have efficient data manipulation, filtering and visualisation displays allowing the page to be well suited for the sports project.

To meet Basketball Victoria's needs the project was structured around three core deliverables:

1. Cleaning and preparing the raw data for integration into dashboard.
2. Developing the dashboard itself with user-controlled filters, and scaling tools (e.g., per-40-minute and per-30-minutes played normalisation)
3. Creating a user manual and maintenance documentation to ensure that Basketball Victoria can independently update the dashboard with new data into the long future of basketball.

The final dashboard was designed with Basketball Victoria's colours and fonts to ensure they maintained their visual identity. User friendly UI elements, such as collapsible filters, scrollable legends and real time filtering were also incorporated based on users defined criteria. Another important feature that the platform supports is multiple data views, which allows users to switch between raw statistics and scaled performance metrics, offering both depth and flexibility in analysis.

No machine learning models were required for this solution as the emphasis was on data cleaning, transformation, and interactive exploratory data analysis. Evaluation was instead focused on usability, performance and functionality which was Basketball Victoria's main concerns. The group ensured the tool we created was intuitive, responsive, and capable of delivering meaningful insights.

In summary this project has been the bridge between data collection and community access, creating a sustainable, scalable platform that supports Basketball Victoria's mission to celebrate performance, foster engagement and empower its stakeholders through data.

Background

Basketball Victoria plays a central role in managing, maintaining, and promoting the popular sport of basketball across the state. As the official governing body, Basketball Victoria is responsible in organising all the competitions, making, and running all the developments programs, being there to support players at their beginning, all the way up to the elite levels. With participation in the sport steadily increasing and with technology reaching the sporting community, Basketball Victoria has been left with an incredibly large volume of data and information that is currently unmaintained and left unfulfilled. Their data ranges from individual player statistics and team results to league wide performance trends.

The main issue Basketball Victoria faces is that most of their data has been historically split across multiple systems over time, which has made it hard for players, coaches and even fans, from gaining access to meaningful insights or part of their history growing up. For example, players who may have played in years prior to 2010 have been left with records that may be either incomplete or inaccessible; this is the main issue for players that are no longer apart of the league. This issue has created a significant barrier in recognising player contributions in teams' history and overall achievements but mainly limits opportunities for data informed decision making at both player development and coaching levels.

To address this issue our group has partnered with Basketball Victoria to help create, design, and implement a structured and easily accessible database platform. The goal of this project is to consolidate existing datasets and transform them into an intuitive online interface that users can explore. By presenting an organised searchable historical dataset, the platform will be able to support players recognition, performance tracking and community engagement.

In a broader context, the data science and analytics have become an essential tool in the sporting world. Many organisations are adopting dashboards and data visualisation tools to help with tracking leagues progress, monitor player statistics and achievements while providing a way for fans to have access to more content. The interest of Basketball Victoria are clearly aligned with this project, as they also seek to leverage the data to both support internal operations and connect with its community in a more meaningful path.

Key components of this project we have included:

1. **Data Cleaning and Preparation:** Ensuring that Basketball Victoria's historical data is consistent, complete, and usable for display purposes.
2. **Dashboard Development:** Building an interactive frontend that allows users to filter, sort, and search through data across players, teams, and seasons.
3. **Sustainability and Handover:** Delivering a user guide that empowers BV staff to maintain and update the system independently going forward.

Project Scope

The primary goal of the project was to enhance Basketball Victoria's player data visualisation and accessibility through the development of an interactive dashboard and a structured data organisation platform.

Aim 1 (A1) focused on recognising past and current player involvements in Basketball by developing an efficient, streamlined platform for highlighting and celebrating players' achievements. This addresses Basketball Victoria's concern of player contributions being overlooked, improving player recognition, and strengthening the larger basketball community.

Aim 2 (A2) intended to develop the dashboard into a publicly available website, like industry standards such as ESPN or Basketball Reference, where external users could view player statistics and records. This objective was to connect the community, develop the sport and provide a historical archive for Basketball Victoria.

Aim 3 (A3) focused on creating a system that Basketball Victoria could update, with recent games and statistics at their preferred frequency (whether after every game or season etc.). This goal required providing specific instructions on how to maintain and update the dashboard with new data.

Aim 4 (A4) focused on stakeholder driven iterative improvements. In response to user feedback from Basketball Victoria themselves, the group has made further refinements to the product.

To fulfill the needs of Basketball Victoria, the above aims were set through three deliverables:

1. Cleaning and preparing the raw data for integration into the dashboard.
2. Developing the dashboard with user-controlled filters, and scaling viewing options.
3. Creating an operation and maintenance document to ensure that Basketball Victoria can update the dashboard with new data.

Approach and Methodology for Deliverables

Project Management Approach:

The Kanban methodology was beneficial in managing team workload and processes, ensuring continuous improvements across all three deliverables. By visualising tasks using a team Trello board, task status, assignment, and priorities were able to be identified, with any hurdles identified early. This method supported A1, allowing the features of the dashboard (e.g. player filtering) to be built using a systematic and methodical approach. For A2, the Kanban gradual implementation framework allowed for the progressive creation and modification of dashboard elements, to ensure that the needs of Basketball Victoria can be met. This method too supported A3, with a strong focus on maintenance and continuous improvement of the system, when fresh data becomes accessible.

Technical Implementation of Deliverables:

The project for Basketball Victoria had three distinct deliverables, each designed to address the specific aims discussed above. Using interactive data visualisation frameworks, the Streamlit dashboard was implemented, allowing these deliverables to be deployed.

Deliverable P1 - Data Cleaning and Preparation: This approach was critical in producing deliverable P1, a cleaned and combined data source with all of Basketball Victoria's player statistical data. This deliverable ensures data integrity, while also remaining in a format that can assist with future data updates required by Basketball Victoria. Through excessive yet necessary data preparation techniques, including the removal of improper values and standardisation of columns, a cleansed data source was developed. The data preparation phase was essential for ensuring accurate player statistic recognition (A1), and developing a foundation that allows for simple updates (A2).

Deliverable P2 – Interactive Dashboard: The second deliverable, was functional dashboard that has sorting and filtering abilities through a database, enabling users to explore player statistics through personalisation tools. Data transformation techniques, including per-minute and 40-minute scaling was incorporated to ensure that statistics were being accurately reflected. Aggregation was completed using Pandas' groupby functions, allowing for the calculation of career averages, which assisted in fulfilling (A1). The dashboard also provides filtering options to the user, improving the data exploration experience for users (A2).

Deliverable P3 – Documentation and Maintenance: The third deliverable, was clear documents that outlines how the code works, how to deploy and how to update the dashboard for new data. This included a readme file, containing step-by-step instructions with images to assist in the setup, along with links to video tutorials. This ensures that the system can be of real-world use, and encourages the maintenance of the dashboard, in a simple way. This fulfilled the aim of having an

updatable dashboard (A3), with the document outlining maintenance and updating processes. This ensures that the dashboard lasts beyond RMIT's participation, acting as a useable real-world tool.

Results, Evaluation and Analysis

Aim 1 (A1): Player Recognition and Achievement Platform:

- Results:
 - o Player search functionality: Successfully implemented player name search, with real-time filtering across 15+ years of historical data. There is also a reset feature, so that these filters are reset by users, increasing efficiency.
 - o Careers statistic aggregation: Created career totals and averages that demonstrate player performance across various competitions and seasons.
 - o Multiple display view: Successfully implemented 4 different statistical perspectives (totals, averages, 40-minute adjusted, 30-minute adjusted) to represent player contributions equally regardless of playing time.
- Evaluation: The dashboard successfully eliminates Basketball Victoria's concern about forgotten player contribution. Through testing with Basketball Victoria's staff, it was found that players had no way to access their historical records, as there are no current platforms that exist, which focus on career and season by season data. Using the implemented dashboard, past players now have these in a simplified, centralised form.
- Discussion: The comprehensive player search and career aggregation fulfills the objective of providing players to celebrate past achievements. The multiple scaling options ensure standardised comparison between players from various seasons, producing a platform for all participants in Basketball Victoria's history.

Aim 2 (A2): Public Access Website Development:

- Results:
 - o Public dashboard deployment: Successfully deployed the dashboard on Streamlit's cloud, making it access to anyone holding the link.
 - o User-friendly interface: Implemented design choices that align with Basketball Victoria's current website, to ensure cohesiveness. Additionally, simple buttons and hidden legend systems are also included to assist users; even those without a technical background.
 - o Industry standard elements: Filtering, sorting, and search capabilities were included, which reflect the same standards as professional sporting statistic websites, such as ESPN.
- Evaluation: The dashboard mends the gap between Basketball Victoria's data, and the wider Basketball community's access. Through user testing, users without a technical background were able to successfully navigate the dashboard without assistance, indicating it is suitable for the public.
- Discussion: The dashboard allows Basketball Victoria's community to explore historical performance statistics, on a global platform. The Streamlit cloud hosting platform ensures simple, public access.

Aim 3 (A3): System Updates:

- Results:
 - o Read-me document: Created a detailed read me file, outlining steps on how to set up the software, update the data, and deploy it onto Streamlit. Additionally, a document was also created to provide information regarding how to upload it to the AWS platform as requested.

- Code structure: The code is well commented, so that Basketball Victoria can follow along and make any changes necessary.
- System transfer: Handover of the system was completed with Basketball Victoria's staff, including the sharing of GitHub, as well as installation of applications such as Visual Studio Code and Jupyter Notebooks.
- Evaluation:

The system update documents allow Basketball Victoria to have complete control and ownership over the developed dashboard. Initially, the user-based performance feedback received included 'slow loading time' and 'no reset button' which limited accessibility. To better improve the dashboard, the data was separated into multiple, smaller datasets, rather than one large one, improving loading time largely. A reset function was also included, allowing users to 'reset for all filters', as per requested by the stakeholders.
- Discussion: Through providing a combination of written documents, code, and verbal knowledge transfer, the staff at Basketball Victoria were provided with all of the resources necessary to use the dashboard in a professional environment, whilst also being able to regularly refresh the data to reflect updated player contributions.

Aim 4 (A4):

- Results:
 - Vocabulary reconstructions: Successfully removed, and re-worded elements to improve clarity and reduce clutter visually (eg. changed 'Show Scrollable Column Legend' to 'Show Legend').
 - Improved user control: Implemented a reset function to allow users to remove all applied filters.
 - Column removal and restructure: Successfully removed irrelevant columns, including levels, factor and minute from the relevant tables, and ensured that 'Name' and 'Gender' columns were presented at the start.
 - Ordering of club name filters: Permanently ordered club names alphabetically via the dropdown filter, to maintain consistency.
 - Improved accessibility: Tooltips were provided in the form of descriptions under the relevant tables, to provide context and reduce confusion for users, as seen in Figure 4.
- Evaluation: The continuous improvement process showed successful stakeholder communication and team responsive implementations. The collaborative channel with Basketball Victoria allowed for improvements based off extensive stakeholder testing, in a real-world setting. The adjustments effectively fulfill the needs of Basketball Victoria, while also improving usability for users.
- Discussion: The stakeholder testing demonstrated the need for user testing during the development stage of the dashboard. Through placing focus on Basketball Victoria's needs and concerns, not only did the implemented changes improve stakeholder trust, but also user experience. This method of testing, then implementing, ensured that the dashboard consistency aligns with what Basketball Victoria is after.

Final Results Screenshots:

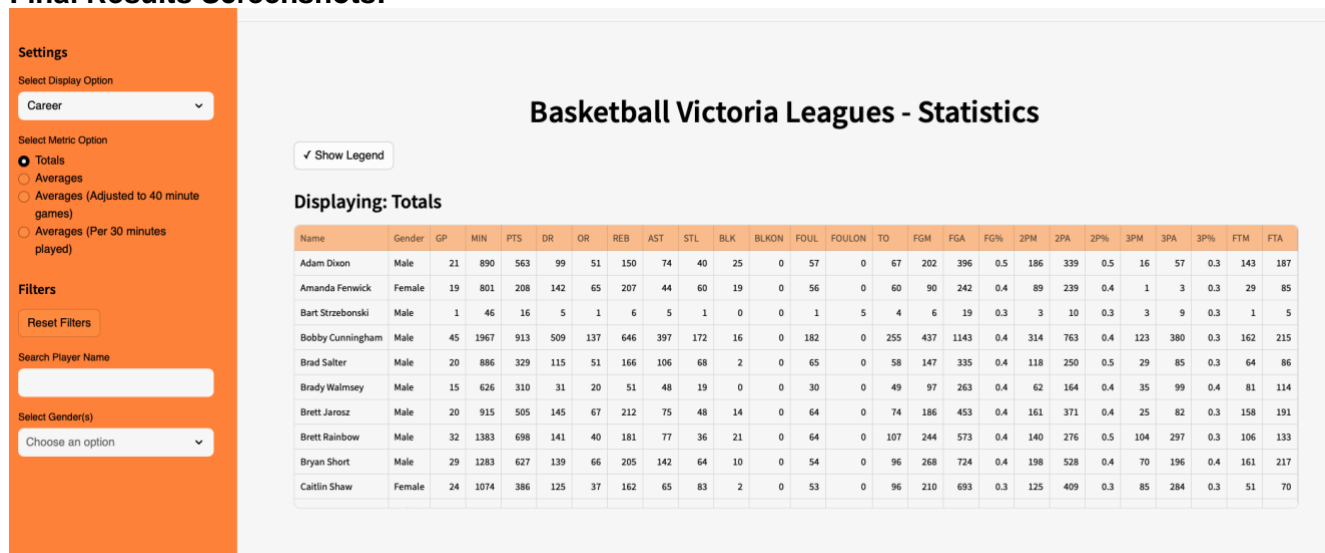


Figure 1: Default page of the dashboard

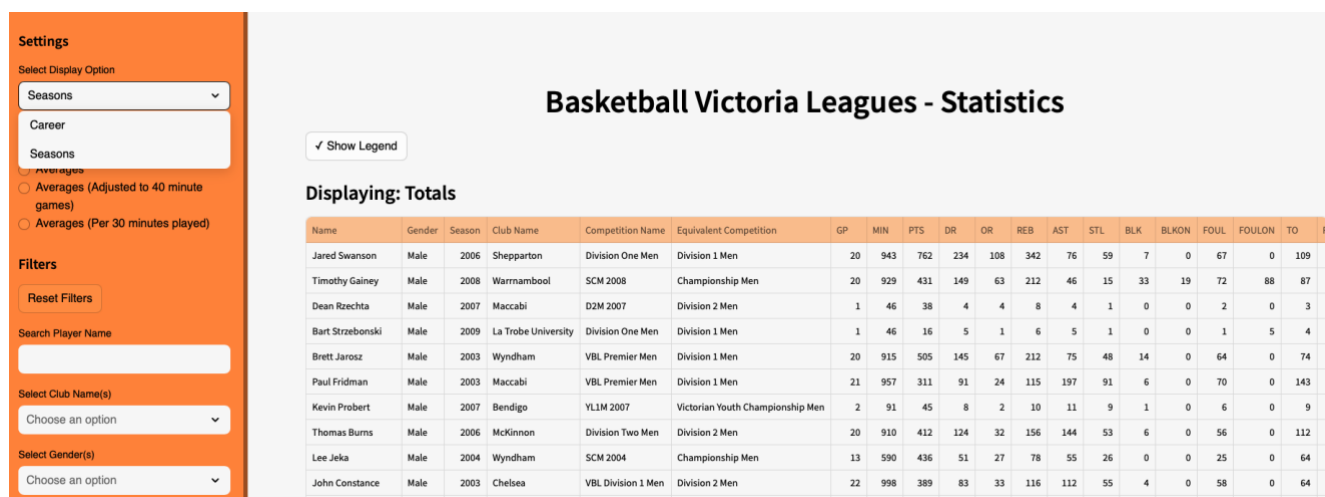


Figure 2: Season total table display

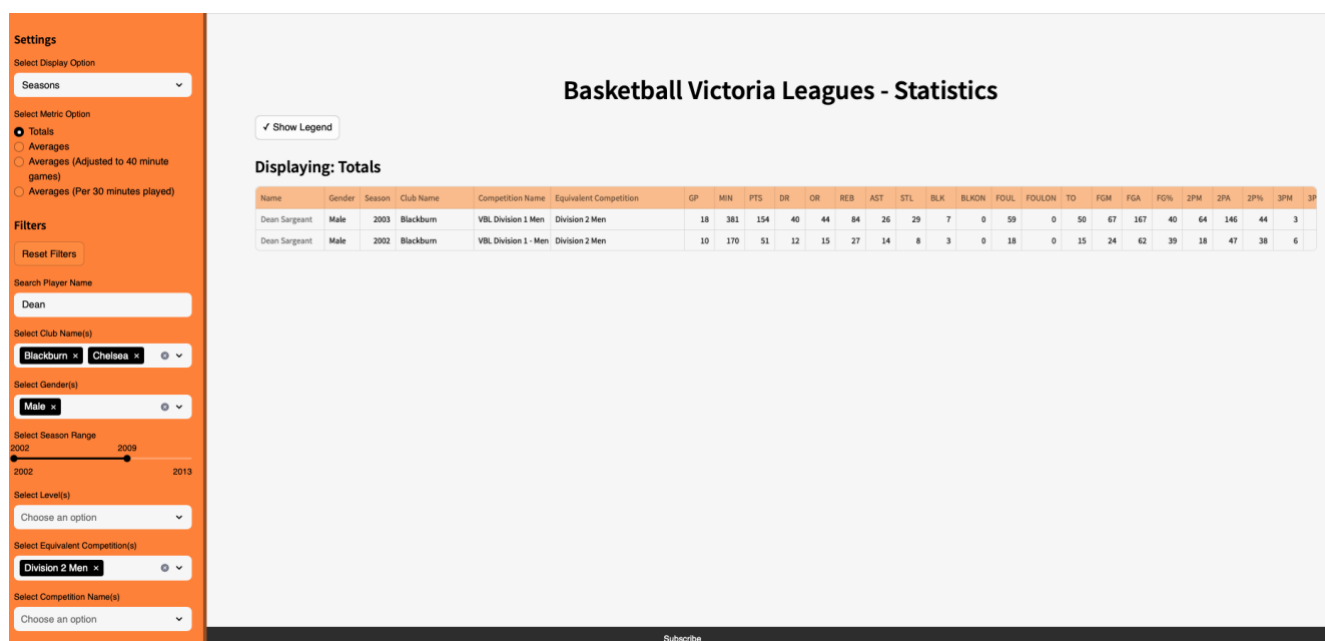


Figure 3: Season total table display, with filters successfully applied



Figure 4: Career Average (Adjusted to 40-minute games) display, with 'Brad' player name search

Dashboard Link: <https://dashboard-basketballvictoria.streamlit.app/>

To view the live dashboard, please use the link above.

Analysis Based on Results and Approach:

The Kanban methodology implemented through Trello was extremely effective in managing project deliverables and team tasks, along with Microsoft Teams as the main communication platform. Task status and development on Trello, along with regular team meetings, allowed for deliverables to be completed on time, while still meeting the needs of Basketball Victoria. The results demonstrated that the data cleaning process successfully transformed raw historical data into a useable, sorted database.

Trello board link:

<https://trello.com/invite/b/67dfb2b8530833b2e8802ac1/ATTI64c7d24a721ec2539458b32e4b72d946BCED64B9/data-science-project>

As this project was focused on data exploration, no machine learning models were used. This approach aligns with Basketball Victoria's requirements for having historical data accessible to the wider community, to provide users the ability to explore past records.

Software Functionality

The development of Basketball Victoria's project focused on building an interactive data driven dashboard which prioritised accessibility, usability, and performance over complex modelling. The work centred on transforming fragmented historical data into an engaging platform which would highlight player achievements and supports exploration of career and seasonal statistics. Instead of relying on a machine learning backbone, the dashboard was built using a combination of data cleaning, transformations, and intuitive visual design.

Initial data inspection was done in Excel, where inconsistencies were identified. Python was utilised to clean the dataset (eg. columns were standardised - all player names followed a uniform format). Scaling techniques were applied to normalise statistics based on different playing times, which allowed fairer comparisons across players. Using the Pandas language, where aggregated metrics such as career averages and season totals were calculated, users were able to be provided with a more comprehensive view of how players performed throughout their time in the league.

The dashboard itself was developed using Streamlit, which was chosen for its ability to properly integrate Python code and its ease of deployment for interactive applications. The design allows users to filter, search and reset data according to whichever specific filters they desire. Rather than

having tables that are static, the dashboard contains tables that respond dynamically to user selections, making the tool highly interactive. Conditional formatting helped draw attention to relevant results while collapsible legends and tabbed views offered a cleaner layout.

A conscious effect was made to reflect Basketball Victoria's branding in the user interface, through ensuring the colours and typography match. This created a cohesive visual identity and made the platform feel familiar to users. The dashboard was able to support not only just detailed and high-level analytics, but also allows users to toggle between raw values, per minute statistics and any other adjusted formats. Filters and sorting tools allow users to dig deeper into the insights without information becoming overwhelming for users without much technical background.

The system was designed with practicality and maintainability as a priority. Data was read from a central Excel file using the openpyxl engine and transformed into structured Panda's dataframes. The front-end section was built around a wide layout with logical thinking when placing filters, toggles, and the descriptive elements. Interactivity was also key for our project with filters (eg. user driven column selection and highlight functions) to support meaningful exploration of the data.

While the project did not require any machine learning techniques, it still needed careful evaluation. Success was measured by how well the platform performed in real world use cases. Feedback was provided directly from Basketball Victoria, confirming that the dashboard was easy to navigate, responsive and a valuable tool for player recognition. Performance was strong with smooth filtering, with loading times improved due to the multi-table cleansing method used, rather than implementing one large data set. Importantly, users could extract insights with very minimal effort, which achieves the primary aim of enhancing access to historical player data.

Development took place in Visual Studio Code, with GitHub used as the collaborative platform and visual control. The environments and languages included Python, Pandas, Streamlit, HTML, CSS, SQL. The dashboard is currently hosted on a Streamlit Cloud with future plans for possible migration to AWS, which was communicated to Basketball Victoria with steps provided on how to do so.

To support the dashboard's ability to switch between different performance views, eight datasets were made, each showing a different analytical perspective:

1. **Season by Season Totals:** Aggregated raw stats per player per season.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
Name	Club Name	Competition	Equivalent C Level	Gender	Season	Factor	GP	MIN	PTS	DR	OR	REB	AST	STL	BLK	BLKON	
Jared Swans	Shepparton	Division One	Division 1 Me Senior	Male	2006	0.83333333	20	943	762	234	108	342	76	59	7	0	
Timothy Gain	Warrnambool	SCM 2008	Championsh	Senior	Male	2008	0.83333333	20	929	431	149	63	212	46	15	33	19
Dean Rzecht	Maccabi	D2M 2007	Division 2 Me Senior	Male	2007	0.83333333	1	46	38	4	4	8	4	1	0	0	
Bart Strzeboi	La Trobe Univ	Division One	Division 1 Me Senior	Male	2009	0.83333333	1	46	16	5	1	6	5	1	0	0	
Brett Jarosz	Wyndham	VBL Premier I	Division 1 Me Senior	Male	2003	0.83333333	20	915	505	145	67	212	75	48	14	0	
Paul Fridman	Maccabi	VBL Premier I	Division 1 Me Senior	Male	2003	0.83333333	21	957	311	91	24	115	197	91	6	0	
Kevin Probert	Bendigo	YL1M 2007	Victorian You	Youth	Male	2007	0.83333333	2	91	45	8	2	10	11	9	1	0
Thomas Burn	McKinnon	Division Two	Division 2 Me Senior	Male	2006	0.83333333	20	910	412	124	32	156	144	53	6	0	
Lee Jeka	Wyndham	SCM 2004	Championsh	Senior	Male	2004	0.83333333	13	590	436	51	27	78	55	26	0	0
John Constar	Chelsea	VBL Division	Division 2 Me Senior	Male	2003	0.83333333	22	998	389	83	33	116	112	55	4	0	
Sean McCall	Coburg	Division One	Division 1 Me Senior	Male	2005	0.83333333	2	90	61	18	9	27	4	7	3	0	
Warren Estcc	Bulleen	VBL Division	Division 2 Me Senior	Male	2002	0.83333333	1	45	3	8	0	8	7	0	0	0	
Vashon Weav	Latrobe City	SCM 2007	Championsh	Senior	Male	2007	0.83333333	19	852	418	119	51	170	110	24	10	0
Lee Jeka	Wyndham	SCM 2005	Championsh	Senior	Male	2005	0.83333333	9	403	243	57	17	74	54	15	2	0
Caitlin Shaw	Diamond Val	VBL Division	Division 2 Wc Senior	Female	2002	0.83333333	24	1074	386	125	37	162	65	83	2	0	

Figure 5: Season by season totals Excel dataset

2. Career Totals: Summed statistics over all seasons for each player.

Name	Gender	GP	MIN	PTS	DR	OR	REB	AST	STL	BLK	BLKON	FOUL	FOULON	TO	FGM	FGA	FG%
Aaliyah Cord	Female	16	86	12	3	5	8	1	1	0	1	10	4	6	4	17	23.5
Aaron Abram	Male	16	392	254	98	46	144	21	11	8	5	57	56	38	96	226	42.5
Aaron Bartra	Male	21	510	93	51	33	84	30	13	1	10	28	15	47	36	157	22.9
Aaron Blumb	Male	63	848	266	133	50	183	36	16	31	13	66	46	52	114	249	45.8
Aaron Booth	Male	42	596	168	166	60	226	14	20	20	6	116	58	40	72	152	47.4
Aaron Bosani	Male	21	194	35	21	14	35	11	13	1	2	24	15	26	14	63	22.2
Aaron Bower	Male	42	905	385	115	43	158	122	41	1	12	68	119	110	135	366	36.9
Aaron Bruce	Male	11	420	324	42	9	51	62	35	4	0	33	1	52	141	319	44.2
Aaron Calleg	Male	29	914	340	82	50	132	105	39	4	0	90	0	129	122	279	43.7
Aaron Carltro	Male	180	3166	1125	319	74	393	91	75	13	15	162	85	156	383	1059	36.2
Aaron Cantor	Male	2	8	2	2	0	2	1	0	0	0	1	0	0	1	3	33.3
Aaron Davids	Male	52	386	176	28	36	64	42	14	0	12	36	22	26	70	158	44.3
Aaron Dolny	Male	40	585	312	57	15	72	23	17	3	1	61	69	39	101	293	34.5

Figure 6: Career totals Excel dataset

3. Season by Season Averages: Per game averages calculated for each stat per season.

Name	Club Name	Competition	Equivalent C Level	Gender	Season	Factor	GP	MIN	PTS	DR	OR	REB	AST	STL	BLK	BLKON	FOUL
Jared Swans	Shepparton	Division One	Division 1 Me Senior	Male	2006	0.83333333	20	47.2	38.1	11.7	5.4	17.1	3.8	3	0.4	0	3.4
Timothy Gain	Warrnambo	SCM 2008	Championsh Senior	Male	2008	0.83333333	20	46.4	21.6	7.4	3.2	10.6	2.3	0.8	1.6	1	3.6
Dean Rzech	Maccabi	D2M 2007	Division 2 Me Senior	Male	2007	0.83333333	1	46	38	4	4	8	4	1	0	0	2
Bart Strzebo	La Trobe Univ	Division One	Division 1 Me Senior	Male	2009	0.83333333	1	46	16	5	1	6	5	1	0	0	1
Brett Jarosz	Wyndham	VBV Premier	Division 1 Me Senior	Male	2003	0.83333333	20	45.8	25.2	7.2	3.4	10.6	3.8	2.4	0.7	0	3.2
Paul Fridman	Maccabi	VBV Premier	Division 1 Me Senior	Male	2003	0.83333333	21	45.6	14.8	4.3	1.1	5.5	9.4	4.3	0.3	0	3.3
Kevin Probert	Bendigo	YL1M 2007	Victorian You Youth	Male	2007	0.83333333	2	45.5	22.5	4	1	5	5.5	4.5	0.5	0	3
Thomas Burn	McKinnon	Division Two	Division 2 Me Senior	Male	2006	0.83333333	20	45.5	20.6	6.2	1.6	7.8	7.2	2.6	0.3	0	2.8
Lee Jeka	Wyndham	SCM 2004	Championsh Senior	Male	2004	0.83333333	13	45.4	33.5	3.9	2.1	6	4.2	2	0	0	1.9
John Constar	Chelsea	VBV Division	Division 2 Me Senior	Male	2003	0.83333333	22	45.4	17.7	3.8	1.5	5.3	5.1	2.5	0.2	0	2.6
Sean McCall	Coburg	Division One	Division 1 Me Senior	Male	2005	0.83333333	2	45	30.5	9	4.5	13.5	2	3.5	1.5	0	3.5
Warren Estec	Bulleen	VBV Division	Division 2 Me Senior	Male	2002	0.83333333	1	45	3	8	0	8	7	0	0	0	3
Vashon Weav	Latrobe City	SCM 2007	Championsh Senior	Male	2007	0.83333333	19	44.8	22	6.3	2.7	8.9	5.8	1.3	0.5	0	3.4
Lee Jeka	Wyndham	SCM 2005	Championsh Senior	Male	2005	0.83333333	9	44.8	27	6.3	1.9	8.2	6	1.7	0.2	0	1
Caitlin Shaw	Diamond Val	VBV Division	Division 2 W Senior	Female	2002	0.83333333	24	44.8	16.1	5.2	1.5	6.8	2.7	3.5	0.1	0	2.2
Travis Banko	Echuca	VBV Division	Division 2 Me Senior	Male	2002	0.83333333	20	44.7	25.2	3.9	1.7	5.6	4.6	2.4	0.1	0	2.8

Figure 7: Season-by-season averages Excel dataset

4. Career Averages: Average performance across all games played in a player's career.

Name	Gender	GP	MIN	PTS	DR	OR	REB	AST	STL	BLK	BLKON	FOUL	FOULON	TO	FGM	FGA	FG%	2PM
Aaliyah Cord	Female	16	5.4	0.8	0.2	0.3	0.5	0.1	0.1	0	0.1	0.6	0.2	0.4	0.2	1.1	18.2	0.2
Aaron Abram	Male	16	24.5	15.9	6.1	2.9	9	1.3	0.7	0.5	0.3	3.6	3.5	2.4	6	14.1	42.6	4.5
Aaron Bartra	Male	21	24.3	4.4	2.4	1.6	4	1.4	0.6	0	0.5	1.3	0.7	2.2	1.7	7.5	22.7	1.1
Aaron Blumb	Male	63	13.5	4.2	2.1	0.8	2.9	0.6	0.3	0.5	0.2	1	0.7	0.8	1.8	4	45	1.6
Aaron Booth	Male	42	14.2	4	4	1.4	5.4	0.3	0.5	0.5	0.1	2.8	1.4	1	1.7	3.6	47.2	1.7
Aaron Bosani	Male	21	9.2	1.7	1	0.7	1.7	0.5	0.6	0	0.1	1.1	0.7	1.2	0.7	3	23.3	0.6
Aaron Bower	Male	42	21.5	9.2	2.7	1	3.8	2.9	1	0	0.3	1.6	2.8	2.6	3.2	8.7	36.8	2.3
Aaron Bruce	Male	11	38.2	29.5	3.8	0.8	4.6	5.6	3.2	0.4	0	3	0.1	4.7	12.8	29	44.1	10.9
Aaron Calleg	Male	29	31.5	11.7	2.8	1.7	4.6	3.6	1.3	0.1	0	3.1	0	4.4	4.2	9.6	43.8	4
Aaron Carltro	Male	180	17.6	6.2	1.8	0.4	2.2	0.5	0.4	0.1	0.1	0.9	0.5	0.9	2.1	5.9	35.6	0.5
Aaron Cantor	Male	2	4	1	1	0	1	0.5	0	0	0	0.5	0	0	0.5	1.5	33.3	0.5
Aaron Davids	Male	52	7.4	3.4	0.5	0.7	1.2	0.8	0.3	0	0.2	0.7	0.4	0.5	1.3	3	43.3	1.1
Aaron Dolny	Male	40	14.6	7.8	1.4	0.4	1.8	0.6	0.4	0.1	0	1.5	1.7	1	2.5	7.3	34.2	0.8
Aaron Edwart	Male	1	7	4	1	0	1	0	0	0	0	1	0	0	2	3	66.7	2
Aaron Evans	Male	75	19.5	6.6	2.4	0.9	3.3	1.1	0.4	0.3	0.2	1.6	0.9	1.5	2.5	7.6	32.9	1.5
Aaron Fox	Male	76	14.6	3.4	1.5	0.6	2.1	2.1	0.8	0.1	0.1	1.5	0.4	1.7	1.4	3.9	35.9	1.1

Figure 8: Career averages Excel dataset

5. Season by Season Averages (Scaled to 40 Minute games): Season averages assuming every game was 40 minutes long.

Name	Club Name	Competition	Equivalent C Level	Gender	Season	Factor	GP	MIN	PTS	DR	OR	REB	AST	STL	BLK	BLKON	FOUL	FOULON
Jared Swans	Shepparton	Division One	Division 1 Me Senior	Male	2006	0.83333333	20	39.3	31.7	9.7	4.5	14.2	3.2	2.5	0.3	0	2.8	0
Timothy Gain	Warrnambo	SCM 2008	Championsh Senior	Male	2008	0.83333333	20	38.7	18	6.2	2.6	8.8	1.9	0.6	1.4	0.8	3	3.7
Dean Rzech	Maccabi	D2M 2007	Division 2 Me Senior	Male	2007	0.83333333	1	38.3	31.7	3.3	3.3	6.7	3.3	0.8	0	0	1.7	0
Bart Strzebo	La Trobe Univ	Division One	Division 1 Me Senior	Male	2009	0.83333333	1	38.3	13.3	4.2	0.8	5	4.2	0.8	0	0	0.8	4.2
Brett Jarosz	Wyndham	VBV Premier	Division 1 Me Senior	Male	2003	0.83333333	20	38.1	21	6	2.8	8.8	3.1	2	0.6	0	2.7	0
Paul Fridman	Maccabi	VBV Premier	Division 1 Me Senior	Male	2003	0.83333333	21	38	12.3	3.6	1	4.6	7.8	3.6	0.2	0	2.8	0
Kevin Probert	Bendigo	YL1M 2007	Victorian You Youth	Male	2007	0.83333333	2	37.9	18.7	3.3	0.8	4.2	4.6	3.7	0.4	0	2.5	0
Thomas Burn	McKinnon	Division Two	Division 2 Me Senior	Male	2006	0.83333333	20	37.9	17.2	5.2	1.3	6.5	6	2.2	0.2	0	2.3	0
Lee Jeka	Wyndham	SCM 2004	Championsh Senior	Male	2004	0.83333333	13	37.8	27.9	3.3	1.7	5	3.5	1.7	0	0	1.6	0
John Constar	Chelsea	VBV Division	Division 2 Me Senior	Male	2003	0.83333333	22	37.8	14.7	3.1	1.2	4.4	4.2	2.1	0.2	0	2.2	0
Sean McCall	Coburg	Division One	Division 1 Me Senior	Male	2005	0.83333333	2	37.5	25.4	7.5	3.7	11.2	1.7	2.9	1.2	0	2.9	0
Warren Estec	Bulleen	VBV Division	Division 2 Me Senior	Male	2002	0.83333333	1	37.5	2.5	6.7	0	6.7	5.8	0	0	0	2.5	0
Vashon Weav	Latrobe City	SCM 2007	Championsh Senior	Male	2007	0.83333333	19	37.4	18.3	5.2	2.2	7.5	4.8	1.1	0.4	0	2.8	0

Figure 9: Season-by-season averages scaled to 40-minutes Excel dataset

6. **Career Averages (Scaled to 40 Minute games):** Aggregated career averages scaled to a 40 minute game.

Name	Gender	GP	MIN	PTS	DR	OR	REB	AST	STL	BLK	BLKON	FOUL	FOULON	TO	FGM	FGA	FG%	2PM	2PA
Aaliyah Cord	Female	16	5.4	0.8	0.2	0.3	0.5	0.1	0.1	0	0.1	0.6	0.2	0.4	0.2	1.1	18.2	0.2	1.1
Aaron Abram	Male	16	24.5	15.9	6.1	2.9	9	1.3	0.7	0.5	0.3	3.6	3.5	2.4	6	14.1	42.6	4.5	9.6
Aaron Bartra	Male	21	20.2	3.7	2	1.3	3.3	1.2	0.5	0	0.4	1.1	0.6	1.9	1.4	6.2	22.6	1	3.3
Aaron Blumb	Male	63	13.5	4.2	2.1	0.8	2.9	0.6	0.3	0.5	0.2	1	0.7	0.8	1.8	4	45	1.6	3.3
Aaron Booth	Male	42	14.2	4	4	1.4	5.4	0.3	0.5	0.5	0.1	2.8	1.4	1	1.7	3.6	47.2	1.7	3.6
Aaron Bosani	Male	21	9.2	1.7	1	0.7	1.7	0.5	0.6	0	0.1	1.1	0.7	1.2	0.7	3	23.3	0.6	2.4
Aaron Bower	Male	42	21.5	9.2	2.7	1	3.8	2.9	1	0	0.3	1.6	2.8	2.6	3.2	8.7	36.8	2.3	5.8
Aaron Bruce	Male	11	31.8	24.5	3.2	0.7	3.9	4.7	2.7	0.3	0	2.5	0.1	3.9	10.7	24.2	44.2	9.1	18
Aaron Calleg	Male	29	26.3	9.8	2.4	1.4	3.8	3	1.1	0.1	0	2.6	0	3.7	3.5	8	43.8	3.3	7.3
Aaron Caritto	Male	180	17.3	6.1	1.7	0.4	2.1	0.5	0.4	0.1	0.1	0.9	0.5	0.9	2.1	5.8	36.2	0.4	1.1
Aaron Conlor	Male	2	3.3	0.8	0.8	0	0.8	0.4	0	0	0	0.4	0	0	0.4	1.2	33.3	0.4	0.4
Aaron Davids	Male	52	7.4	3.4	0.5	0.7	1.2	0.8	0.3	0	0.2	0.7	0.4	0.5	1.3	3	43.3	1.1	2.2
Aaron Dolny	Male	40	14.6	7.8	1.4	0.4	1.8	0.6	0.4	0.1	0	1.5	1.7	1	2.5	7.3	34.2	0.8	1.8
Aaron Edwari	Male	1	7	4	1	0	1	0	0	0	0	1	0	0	2	3	66.7	2	2
Aaron Evans	Male	75	19.5	6.6	2.4	0.9	3.3	1.1	0.4	0.3	0.2	1.6	0.9	1.5	2.5	7.6	32.9	1.5	3.9

Figure 10: Career averages scaled to 40-minutes Excel dataset

7. **Season Averages (Scaled to 30 Minutes Played):** Adjusted to show what players would achieve if they all played 30 minutes per game.

Name	Club Name	Competition	Equivalent C/Level	Gender	Season	Factor	GP	MIN	PTS	DR	OR	REB	AST	STL	BLK	BLKON	FOUL	FOULON
Jared Swans	Shepparton	Division One	Division 1 Mc Senior	Male	2006	0.83333333	20	47.2	24.2	7.4	3.4	10.9	2.4	1.9	0.3	0	2.2	0
Timothy Gain	Warrnambool	SCM 2008	Championsh Senior	Male	2008	0.83333333	20	46.4	14	4.8	2.1	6.9	1.5	0.5	1	0.6	2.3	2.8
Dean Rzecht	Maccabi	D2M 2007	Division 2 Mc Senior	Male	2007	0.83333333	1	46	24.8	2.6	2.6	5.2	2.6	0.7	0	0	1.3	0
Bart Strzebol	La Trobe Univ	Division One	Division 1 Mc Senior	Male	2009	0.83333333	1	46	10.4	3.3	0.7	3.9	3.3	0.7	0	0	0.7	3.3
Brett Jarosz	Wyndham	VB Premier	Division 1 Mc Senior	Male	2003	0.83333333	20	45.8	16.5	4.7	2.2	6.9	2.5	1.6	0.5	0	2.1	0
Paul Fridman	Maccabi	VB Premier	Division 1 Mc Senior	Male	2003	0.83333333	21	45.6	9.7	2.8	0.7	3.6	6.2	2.8	0.2	0	2.2	0
Kevin Probert	Bendigo	YLIM 2007	Victorian Yoc Youth	Male	2007	0.83333333	2	45.5	14.8	2.6	0.7	3.3	3.6	3	0.3	0	2	0
Thomas Burn	McKinnon	Division Two	Division 2 Mc Senior	Male	2006	0.83333333	20	45.5	13.6	4.1	1.1	5.1	4.7	1.7	0.2	0	1.8	0
Lee Jeka	Wyndham	SCM 2004	Championsh Senior	Male	2004	0.83333333	13	45.4	22.1	2.6	1.4	4	2.8	1.3	0	0	1.3	0
John Constar	Chelsea	VB Division	Division 2 Mc Senior	Male	2003	0.83333333	22	45.4	11.7	2.5	1	3.5	3.4	1.7	0.1	0	1.7	0
Sean Mccall	Coburg	Division One	Division 1 Mc Senior	Male	2005	0.83333333	2	45	20.3	6	3	9	1.3	2.3	1	0	2.3	0
Warren Estcc	Bulleen	VB Division	Division 2 Mc Senior	Male	2002	0.83333333	1	45	2	5.3	0	5.3	4.7	0	0	0	2	0
Vashon Weav	Latrobe City	SCM 2007	Championsh Senior	Male	2007	0.83333333	19	44.8	14.7	4.2	1.8	6	3.9	0.9	0.3	0	2.3	0

Figure 11: Season-by-season averages scaled to 30-minutes played Excel dataset

8. **Career Averages (Scaled to 30 Minutes Played):** Career performance averages if all players played 30 min per game

Name	Gender	GP	MIN	PTS	DR	OR	REB	AST	STL	BLK	BLKON	FOUL	FOULON	TO	FGM	FGA	FG%
Aaliyah Cord	Female	16	5.4	4.4	1.1	1.7	2.8	0.6	0.6	0	0.6	3.3	1.1	2.2	1.1	6.1	18
Aaron Abram	Male	16	24.5	19.5	7.5	3.6	11	1.6	0.9	0.6	0.4	4.4	4.3	2.9	7.3	17.3	42.2
Aaron Bartra	Male	21	24.3	5.4	3	2	4.9	1.7	0.7	0	0.6	1.6	0.9	2.7	2.1	9.3	22.6
Aaron Blumb	Male	63	13.5	9.3	4.7	1.8	6.4	1.3	0.7	1.1	0.4	2.2	1.6	1.8	4	8.9	44.9
Aaron Booth	Male	42	14.2	8.5	8.5	3	11.4	0.6	1.1	1.1	0.2	5.9	3	2.1	3.6	7.6	47.4
Aaron Bosani	Male	21	9.2	5.5	3.3	2.3	5.5	1.6	2	0	0.3	3.6	2.3	3.9	2.3	9.8	23.5
Aaron Bower	Male	42	21.5	12.8	3.8	1.4	5.3	4	1.4	0	0.4	2.2	3.9	3.6	4.5	12.1	37.2
Aaron Bruce	Male	11	38.2	23.2	3	0.6	3.6	4.4	2.5	0.3	0	2.4	0.1	3.7	10.1	22.8	44.3
Aaron Calleg	Male	29	31.5	11.1	2.7	1.6	4.4	3.4	1.2	0.1	0	3	0	4.2	4	9.1	44
Aaron Caritto	Male	180	17.6	10.6	3.1	0.7	3.8	0.9	0.7	0.2	0.2	1.5	0.9	1.5	3.6	10.1	35.6
Aaron Conlor	Male	2	4	7.5	7.5	0	7.5	3.8	0	0	0	3.8	0	0	3.8	11.2	33.9
Aaron Davids	Male	52	7.4	13.8	2	2.8	4.9	3.2	1.2	0	0.8	2.8	1.6	2	5.3	12.2	43.4
Aaron Dolny	Male	40	14.6	16	2.9	0.8	3.7	1.2	0.8	0.2	0	3.1	3.5	2.1	5.1	15	34
Aaron Edwari	Male	1	7	17.1	4.3	0	4.3	0	0	0	0	4.3	0	0	8.6	12.9	66.7

Figure 12: Career averages scaled to 30-minutes played Excel dataset

Each dataset was made to support distinct user perspectives and use cases on the dashboard. The season-by-season datasets (1,3,5,7) let users to track individual progression over time, which is ideal for identifying peak years or player improvement/regression, as seen in Figures 5,7,9 and 11. The career level datasets (2,4,6,8) aggregate across all seasons, giving a consolidated summary of a player's basketball performance throughout their time in the sport, as seen in Figures 6, 8, 10 and 12.

To make sure fairness in comparison across different contexts, two types of scaled datasets were developed. The 30-minute adjusted datasets were created to simulate how every player would perform if they all played 30 minutes per game. This approach provides fairer comparisons between high minute starters and lower minute role players by normalising playing time. Separately, the 40-minute adjusted datasets were designed to standardise game length across different eras of Victorian basketball, where some leagues historically used 48-minute formats and others used 40-minute formats. By scaling all stats to a 40-minute game baseline, these datasets help level the playing field when comparing players from different rule periods. In all scaled datasets, only relevant performance metrics were adjusted, while nonnumeric values such as name, gender, club were left the same. All datasets were formatted the same with consistent column ordering, cleaned of missing

values, and rounded for clarity. Together, these eight datasets help users have a meaningful exploration within the dashboard.

For a smooth integration into the Streamlit dashboard, all datasets are formatted the same. For better readability, all statistics were rounded, missing values were handled appropriately, and columns were renamed and arranged consistently. These eight datasets work together to create an insightful dashboard that lets users view data from a variety of perspectives and gives them a chance to appreciate the history of the "BigV" and its history, including its player, just like Basketball Victoria had envisioned.

Conclusion

This project has successfully delivered a robust, user-friendly dashboard that was about to bridge the gap for Basketball Victoria between its extensive historical data and its community of players, coaches', fans, and audiences. By focusing on data preparation, intuitive design, as well as sustainability, a platform was created that empowers the stakeholders to explore individual and team achievements with ease. The iterative feedback driven approach ensured that the final product met what was expected by both technical and the non-technical users.

While no machine learning was needed for this task, the project demonstrated the powerful role of interactive exploratory data analysis in the sporting domain. The dashboard now serves as a scalable, maintainable, and publicly usable system that will celebrate player history of the league and support future data driven decisions.

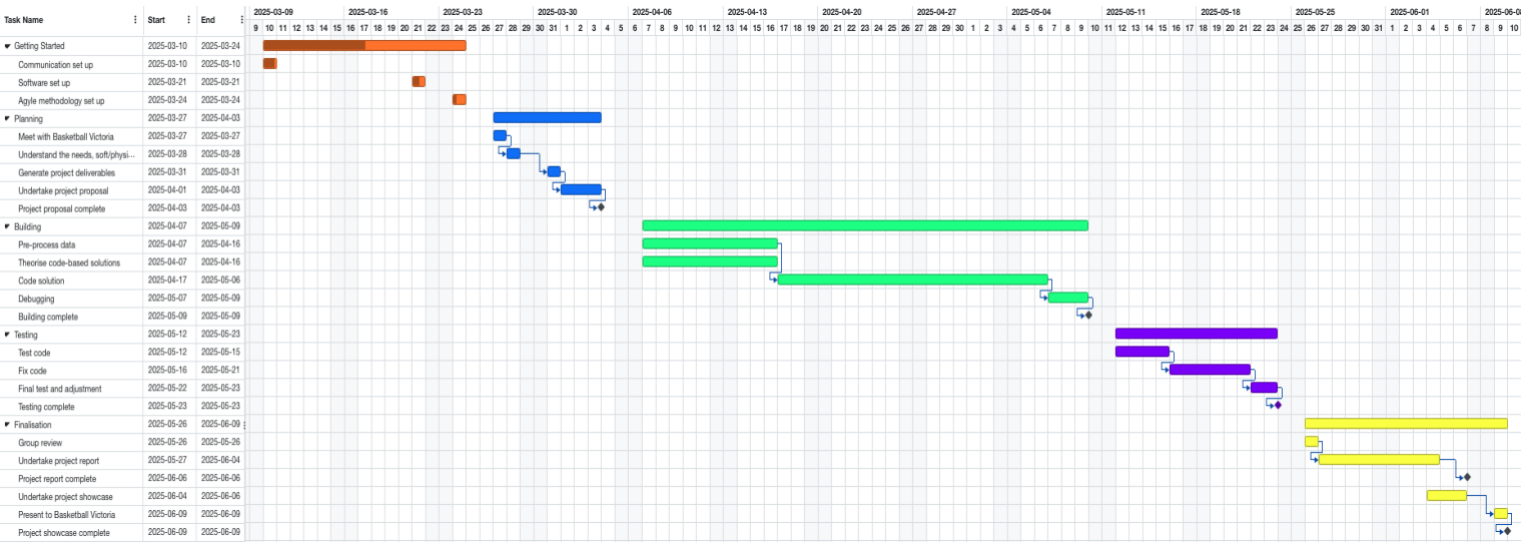
Looking ahead, future work could focus on improving the backend automation for data updates, integrating additional performance metrics, or even looking into incorporating predictive models to support scouting and development for promising talent. By continuing to build on this foundation, Basketball Victoria can maintain a strong data presence that will evolve with the sport for many years to come.

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Code and Project Management

- The details to access the GitHub repository of the code to be delivered to the industry partner via a readme file.
- The details to access the project management in Trello.
- The project was also managed using a Gantt Chart, that can be seen below:



Roles and Responsibilities

Team Members:

- Aiden Tsui, s4005768
- Aashish Thoutam, s4009168
- Isabelle Delija, s4005575
- Ben Nanayakkara, s4008822

Group member 1, s4005678 (Aiden)

Role:

Role	Role description
Back-end leader, deployment	<ul style="list-style-type: none">- Deal with backend code about the creation of the dashboard- Organise Trello for the team- Maintain GitHub so that code runs- Create user manual to operate code- Set up document and presentation- Host web application- Ensure dashboard works with the dataset- Read me file

	Facilitate and answer questions to basketball Vicotria
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Deliverables:

Deliverable	Information
Dashboard	Filter features Highlight features Sort features Data display Corrugated data Pin columns feature
User manual	How the code works How to run the code How to update the code How to add new data
Web host	<ul style="list-style-type: none"> - Host dashboard on streamlit for public access - Research into AWS for host report
Project proposal	<ul style="list-style-type: none"> - Expected outcomes - Project deliverables - Measurement of success - Resources and stakeholders - Project plan - Project timeline - Team member roles - Risk management - Aided with the core aims
Final report	Methodology Individual work(created all the tables for the group to fill in) reflection

Tools used for Deliverables:

Tools	Description
Database	Excel/ Google sheets
Python	Used for dashboard creation Libraries used: <ul style="list-style-type: none"> - Pandas (importing data) - Streamlibs (dashboard tool) - (Data visualisation tool for highlighting)
GitHub	To share code
Trello	For project management
reports	Word/ PowerPoint
Web host	Streamlit cloud

Individual work:

Week	Time (hours)	Information
3	8	Set up <ul style="list-style-type: none"> - GitHub, I created the repository with basic files and invited all the team members to it - Trello, set up all the sprints and Trello board with initial tasks and add everyone to it - Set up and sent Working with Children's Check
4	15	Project proposal <ul style="list-style-type: none"> - Expected outcomes - Project deliverables - Measurement of success

		<ul style="list-style-type: none"> - Resources and stakeholders - Project plan - Project timeline - Team member roles - Risk management - Aided with the aims
5	15	<p>Project planning</p> <ul style="list-style-type: none"> - Organising what needs to be done and splitting workloads and setting up roles for the team <p>Researching solutions/ tools</p> <ul style="list-style-type: none"> - Prototyping solutions, researching and trying out different python libraries <p>Trello</p> <ul style="list-style-type: none"> - Made updates to Trello board to be more specific <p>Code</p> <ul style="list-style-type: none"> - Trialled with data visualisation - Trialled with player summary statistics
6	11	<p>Coding</p> <ul style="list-style-type: none"> - Continue with prototyping <p>Adding features</p> <ul style="list-style-type: none"> - Understanding and trying to implement what basketball Victoria wants <p>Data update</p> <ul style="list-style-type: none"> - Received initial data - 1 on 1 meeting with Kev to come to mutual understanding of project
7	16	<p>Coding</p> <ul style="list-style-type: none"> - Created a highlighting feature - More changes to the filters - Removed data visualisation and statistics - Added sorting feature - Added pin columns feature <p>Trello update</p> <ul style="list-style-type: none"> - Adding and moving tasks <p>Prototyping database solutions</p> <ul style="list-style-type: none"> - Trialled excel math - Trialled python math <p>Created readme file instructions so that the group and others know how to operate the code. Step by step with video links and pictures</p>
8	-	Semester break
9	12	<p>Coding</p> <ul style="list-style-type: none"> - second dataset display on dashboard with filter - Corrugate data in python - Import and run with entire datasets length - Code testing <p>Extra</p> <ul style="list-style-type: none"> - Fixed code annotations - Added more filters <p>Created/ started working on PowerPoint</p> <ul style="list-style-type: none"> - Slide allocations for the group <p>Created the final report document</p> <ul style="list-style-type: none"> - Gave an outline of the individual work section <p>Updated readme file</p> <p>Reviewed Front end and UI design by Isabelle</p>
10	20	<p>Coding</p> <ul style="list-style-type: none"> - Adding user ability to choose dataset - Feature to calculate player averages for each dataset - Created adjusted per game dataset - Created adjusted per min dataset

		<ul style="list-style-type: none"> - Changed code according to feedback (one table only) Bug fixes <p>Worked on report (formatting for group work) Slides (mostly finished my slides) Researched into streamlit host Code rework</p> <ul style="list-style-type: none"> - Reworked code to use Ben's data moving calculations off the dashboard
11	14	<ul style="list-style-type: none"> - Report reflection - Slides - New repository <p>Code</p> <ul style="list-style-type: none"> - Working on bug list - Finalised filters (no more issues) - Added about and subscribe to the U/I <p>Created Jupiter notebook on GitHub repository for database code</p> <ul style="list-style-type: none"> - Git hub extra file <p>Handover meeting</p> <ul style="list-style-type: none"> - Meeting with Brent to communicate technical details for handover, inviting to the repository and going over any technical concerns <p>Created AWS document and initial research into Ec2 on aws for dynamic websites Reviewed bens database work and implemented it with the dashboard</p>
12	18	<p>Testing and fixing</p> <ul style="list-style-type: none"> - Commented out highlight feature - Re organised columns displayed in dashboard to meet basketball Vicotria's requirements - Sorted the filters alphabetically <p>New feature</p> <ul style="list-style-type: none"> - Added reset feature - Working on list given by basketball Victoria <p>Final report</p> <ul style="list-style-type: none"> - Worked on methodology of the final report - Reflection - individual work <p>Dashboard test against criteria</p>
13	12	<ul style="list-style-type: none"> - Bug fixes - Hosting dashboard on streamlit - Finalised report - Finalised presentation - Project handover

Group member 2, s4009168 (Aashish)

Role:

Role	Role Description
Reporting/presentation and AWS	<ul style="list-style-type: none"> - Preparing and completing the report - Creating the PowerPoint slides and presentation - Researching AWS - Finding how to implement AWS and Streamlit - Creating a AWS readme

Deliverables:

Deliverable	Information
Report	<ul style="list-style-type: none"> - Introduction - Background - Software Functionality

	- References
AWS	<ul style="list-style-type: none"> - Researched and successfully implemented the project using Streamlit into AWS to help the needs of Basketball Victoria - Created a Readme/step guide on how Basketball Vic can implement AWS
Trello board	- Ensured Trello was up to date

Tools:

Tools	Description
Word	Project report was completed in Word
PowerPoint	Project presentation was created using PowerPoint
AWS	Researched and successfully implemented the project using Streamlit into AWS to help the needs of Basketball Victoria

Individual work:

Week	Time (hours)	Information
4	8	<ul style="list-style-type: none"> - Worked on project proposal - Planning
5	8	<ul style="list-style-type: none"> - Worked on project proposal - Planning - Set up and sent Working With Children's Check
6	9	Planning phase: <ul style="list-style-type: none"> - Researched which metrics popular websites used to display on their dashboards - Email was sent to basketball Victoria suggesting which metrics to use and asking which metrics they would like
7		- Researched AWS deployment metrics, created AWS deployment document
8	-	Holiday
9	9	Created PowerPoint structure, coordinated slide delegation and worked on report
10	12	<ul style="list-style-type: none"> - Wrote reflection sections and completed references - Set up AWS EC2, tested cloud development
11	15	<ul style="list-style-type: none"> - Fixed AWS hosting issue. - Fixed AWS readme
12	N/A	- N/A
13	10	- Attended development meetings with Basketball Victoria
14	10	- Finalised hosting, completed report references.

Group member 3, s4005575 (Isabelle Delija)

Role:

Role	Role description
Communications leader, front-end leader, report	<ul style="list-style-type: none"> - Managed communication within the team, RMIT coordinator and Basketball Victoria (meetings, messages etc.) - Designed and implemented all front-end UI features - Assisted in bug fixing based on stakeholder feedback - Wrote the project scope, approach and methodology of deliverables, results/discussion/evaluation sections, edited the whole report

Deliverables:

Deliverable	Information
UI for dashboard	<ul style="list-style-type: none"> - Dashboard theme resembling Basketball Victoria's colours - Various buttons for different features
Streamlit implementation	<ul style="list-style-type: none"> - Deployed the dashboard using Streamlit so it is accessible to the public
Readme file	<ul style="list-style-type: none"> - Added steps to demonstrate how to load the dashboard onto Streamlit Cloud
Report	<ul style="list-style-type: none"> - Completion of project scope, approach and methodology of deliverables, results/discussion/evaluation sections

Tools:

Tools	Description
Visual Studio Code	To implement the UI for the dashboard using Streamlit's config element
Streamlit Cloud	To deploy the dashboard onto a public cloud
GitHub	To push and store changes

Individual work:

Week	Time (hours)	Information
2	9	Set up: <ul style="list-style-type: none"> - Teams and chat - Organised meeting with RMIT coordinator - Communicated with team to allocate a meeting time - Sent email to Basketball Victoria requesting a suitable meeting time - Investigated topic and possible solutions
3	10	<ul style="list-style-type: none"> - Project Proposal - Followed up with Basketball Victoria to organise a meeting time - Set up and sent Working With Children's Check - Organised first meeting date/time with the team and Basketball Victoria - Ensured that the team had GitHub properly set up
4	11	<ul style="list-style-type: none"> - Updated project proposal PowerPoint to reflect a Basketball theme - Ensured that slides were done by a set date by the team - Coordinated Assignment 1 task delegation (split up the assignment, and agreed on task allocations) - Created Gantt Chart for Assignment 1, completed Partner / Client section - Uploaded resources provided by Basketball Victoria to teams
5	10	<ul style="list-style-type: none"> - Chased up with Basketball Victoria to confirm a meeting date/time - Liaised with Fatemeh regarding unresponsiveness from stakeholders - Agreed that the deliverable will be a dashboard - Reviewed mock dashboard provided by Aiden - Had first meeting with Basketball Victoria (discussed requirements, goals of product etc) - Assessed data provided by Basketball Vic and outlined overlapping columns - Edited, completed references and submitted Assignment 1
6	11	<ul style="list-style-type: none"> - Designed mock up's of the UI for the dashboard, submitted to the team for feedback and adjusted accordingly - Organised and had meeting with Basketball Victoria - Teams meeting with the group to discuss challenges, approaches to completing tasks
7	15	<ul style="list-style-type: none"> - Implemented entire front end UI <ul style="list-style-type: none"> o Debugged any issues in regard to UI o Included logo buttons o Ensured colour and logo matched Basketball Victoria's current website - Pushed front end to GitHub
8	-	Semester Break

9	9	<ul style="list-style-type: none"> - Created Final Report document and uploaded to Teams - Organised and had meeting with Basketball Victoria - Aiden and I had a meeting with Fatemeh - Investigated and outlined team tasks for the week - Implemented a scrollable legend to the UI
10	8	<ul style="list-style-type: none"> - Organised and had team meeting to discuss progress - Organised and had team meeting with Basketball Victoria - Fixed UI bugs (formatting, descriptions etc), pushed to GitHub - Assigned and agreed on tasks to the team for the final report
11	10	<ul style="list-style-type: none"> - Organised and had meeting with Basketball Victoria - Researched Streamlit and deployed dashboard onto Streamlit Cloud - Fixed UI bugs due to Streamlit Cloud viewing options - Wrote methodology for the final report
12	13	<ul style="list-style-type: none"> - Organised and had meeting with Basketball Victoria - Researched AWS deployment of the app - Organised and had team meeting with RMIT coordinator - Went through the readme file from scratch in a virtual machine to test, and fixed any bugs - Updated readme file - Fixed Basketball Victoria's concerns: <ul style="list-style-type: none"> o Implemented radio buttons - Completed project scope, and methodology/approach for report
13	12	<ul style="list-style-type: none"> - Organised and had meeting with Basketball Victoria - Organised and had meeting with team - Fixed Basketball Victoria's concerns: <ul style="list-style-type: none"> o Removed index column o Pinned name column o Implemented a reset button o Fixed sorting overlapping options o Hid certain columns (eg. factor, level) o Implemented tool tips o Added tooltips - Completed results/evaluation for the report - Sent report off for feedback
14	9	<ul style="list-style-type: none"> - Fixed more concerns provided by Basketball Victoria <ul style="list-style-type: none"> o Fixed sorting limit o Fixed decimal display - Fixed report based on feedback from Fatemeh

Group member 4, s4008822 (Ben Nanayakkara)

Role:

Role	Role Description
Head of data preparations	<ul style="list-style-type: none"> - Handling the data - Cleaning and preparation of data - Creating the datasets

Deliverables:

Deliverable	Information
8 datasets	8 cleaned and organised datasets build from the data sent by Kevin showing: <ul style="list-style-type: none"> - Season totals - Career totals - Career averages - Season averages - Season averages (40 min games)

	<ul style="list-style-type: none"> - Career averages (40 min games) - Season averages per 30 min played - Career averages per 30 min played
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Tools:

Tools	Description
Excel	Data is originally assessed in excel.
Jupyter notebook	Data cleaning, preparation and dataset making was all done in jupyter.
VS Code/GitHub	Dataset was tested with dashboard using these tools and all changes were pushed and saved with these tools

Individual work:

Week	Time (hours)	Information
4	8	<ul style="list-style-type: none"> - Worked on project proposal - Planning
5	8	<ul style="list-style-type: none"> - Worked on project proposal - planning
6	9	Planning phase: <ul style="list-style-type: none"> - Researched which metrics popular websites used to display on their dashboards - Email was sent to basketball Victoria suggesting which metrics to use and asking which metrics they would like - Sample dataset was sent for the team to begin work on back end and front end.
7	10	<ul style="list-style-type: none"> - First version of dataset was sent over - Structure of data was analysed in excel - Planning the cleaning steps like researching what commands and libraries to use also what needed to be done on the dataset - First and last name were combined as per Aidens request
8	-	holiday
9	9	<ul style="list-style-type: none"> - Missing values were handled including white space issues - As per meeting here were next data cleaning steps that needed to be done : Cleanse data set that was emailed (remove rows with invalid names, change format of first and last names to first letter capitalised, and the rest lower case. eg. Isabelle NOT ISABELLE)
10	12	<ul style="list-style-type: none"> - Discussed with Aiden if the current handling of first and last names were appropriate for the users ease and if it hindered flexibility - Seabal and NBL1 data still not sent so we have decided to move on from those datasets. - Meeting with Aiden and Kev: New dataset is wanted to show another point of view on the data. (not yet communicated what the dataset is) - On the 7th of May it was communicated by Kev to me and Aiden that a set of datasets are needed to represent if games were played for 40 min.

		<ul style="list-style-type: none"> - New dataset was sent with factors column included which is needed to build the 40 min game datasets - As for now only datasets required are the raw dataset, career averages and 40 min game scaled. 2 new ones and 6 in total.
11	15	<ul style="list-style-type: none"> - Cleaning new dataset - Discussed with Aiden if we should have all datasets combined into once excel or have separate csv's for each dataset. We decided to combine. - Began building the datasets again from the new raw one which was sent and cleaned - Kev has requested shooting percentages for each dataset to be calculated by and printed by streamlit but Aiden and I discussed it would be better to just have them on the dataset. - Began planning how to implement the shooting percentages in jupyter - 1 on 1 call with Aiden showcasing what's been done for data so far - Kevin has sent over a new sample output requesting 2 more datasets showing 30 min playing time. This will require planning and building time.
12	18	<ul style="list-style-type: none"> - 8 datasets are now required, and a sample output is given to make sure we know what the 8 datasets should look like. Currently building these 8 datasets. - Ran a test run of streamlit for Aiden - Discussed with Aiden it would be better to use separate datasets instead of 1 big one - Test data for all 8 datasets showing first 100 rows was made and sent to the team so they could continue testing streamlit. (100 rows to save computing time) - As per Isabelle's request some players showed unusual values, so they were analysed. But all calculations were correct after checking data and re-calculating.
13	10	<ul style="list-style-type: none"> - Began writing my section for the report - FINAL DATSETS (fully cleaned all 30,000 + players) were uploaded to GitHub
14	10	<ul style="list-style-type: none"> - Organised My Python file that all my code was on and uploaded it to Git. - Finishing up report

Meetings/Collaboration:

Small meetings:

Approx. length	Date	Topic	Team Member/s	Who
1 hour	2/5	Breakdown of functions <ul style="list-style-type: none"> - Understanding output - Understanding data 	Aiden	Kev
1 hour	20/5	Talking with Brent and IT experienced person from basketball Victoria. <ul style="list-style-type: none"> - Any issues with code - How to operate code - Sharing repository - Compatibly with current website 	Aiden	Kev, Greg, Brent

Big meetings:

Approx length.	Week	Topic	Team Member/s	Who
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1 hour	2	<ul style="list-style-type: none"> - Discussed project and brief - Set up communication channels 	All	Fatemeh
N/A	3	No meeting as we had issues with getting in touch with Basketball Victoria	N/A	N/A
30 mins	4	<ul style="list-style-type: none"> - Discussed concerns in regard to stakeholder / team contact - Got feedback on project proposal 	Aiden and Isabelle	Fatemeh
1 hour		<ul style="list-style-type: none"> - Presented project proposal - Provided proposed solution - Requested data 	All	Kev/Ted
30 mins	5	<ul style="list-style-type: none"> - Received feedback on project - Ensured to update Trello 	All	Fatemeh
1 hour		<ul style="list-style-type: none"> - Discussed Basketball Victoria's current data sources - Presented demo model and requested feedback 	All	Kev/Ted
30 mins	6	<ul style="list-style-type: none"> - Received more feedback on project, no issues 	Aiden and Isabelle	Fatemeh
1 hour		<ul style="list-style-type: none"> - Basketball Victoria showed demo of what they are looking for - Provided sample data set - Presented design ideas 	All	Kev/Ted
N/A	7	No meeting as we were waiting on data from Basketball Victoria	N/A	N/A
	8	Semester break		
30 mins	9	<ul style="list-style-type: none"> - Received more feedback on project - Ensured to update Trello 	All	Fatemeh
1 hour		<ul style="list-style-type: none"> - Went in detail as to what Basketball Victoria want specifically - Received updated dataset and column legends - Noted changes that had to be made 	All	Kev/Ted
30 mins	10	<ul style="list-style-type: none"> - Presented demo of project - Showed Trello board (still needs updating) - Ensured the data was being cleaned 	All	Fatemeh
1 hour		<ul style="list-style-type: none"> - Showed current implementation - Basketball Victoria wanted 8 separate datasets instead of 1 - Also wants scaled datasets as a feature (40 and 30min scaled) - Noted changes that had to be made 	All	Kev/Ted/Brent
30 mins	11	<ul style="list-style-type: none"> - Showed dashboard improvements - Discussed live demo for stakeholders and issues in regard to time etc. 	Aiden and Isabelle	Fatemeh
1 hour		<ul style="list-style-type: none"> - Showed current implementation - Basketball Victoria provided feedback in terms of dataset calculations and UI display - Noted changes that had to be made 	All	Kev/Ted

30 mins	12	Fatemeh cancelled meeting due to illness, however still had a team meeting to finalise the dashboard	All	N/A
1 hour		<ul style="list-style-type: none"> - Showed current implementation - Dataset outputs did not reflect Kev's outputs - Kev sent through the expected outputs for debugging purposes - Removed logo button for simplification - Noted changes that had to be made 	All	Kev/Ted
20 mins	13	<ul style="list-style-type: none"> - Showed report to Fatemeh and sent for feedback - Provided update on project completeness 	All	N/A
1 hour		<ul style="list-style-type: none"> - Discussed extensive list of changes required by Basketball Victoria that were implemented - Allowed for stakeholder testing - Advised Basketball Victoria to continue testing and provide feedback 	All	Kev/Ted
30 mins	14	<ul style="list-style-type: none"> - Final meeting with Basketball Victoria - Finalised handover and gave thanks 	All	Kev/Ted/Brent

Self-reflection (Individualized)

Aiden's reflection

Coming into this project brought a lot of uncertainties but, I believe I did well to challenge myself and make the most of this experience.

Of the many things which happened, some were good, some not as much. One of the things I thought I did well was, fulfilling my role in the back-end. This is not a role I would usually be confident in, however for this dashboard creation using Git and Python, I took ownership and managed it well. I was able to successfully make an interactive dashboard which has several features as noted in the report. Another aspect I believe I did well was communication. Even though I left many aspects of communication to Isabelle, the messaging to team members, industry and academic supervisor was something I believe I did well. I was able to inform everyone of what I was doing and what needs to be addressed.

On the other hand, this experience brought upon many difficulties which I could have handled better. An example of this included over-burdening myself; where I take on extra group work and overestimate what I could provide for basketball Victoria. This made things more complicated and needed to be simplified down the line. I could change this as well by trusting my team members more. Another error on my behalf is focusing a lot on what I was contributing to the group, where I might be making progress but others not. I learnt that as a group we need to move together, but at the same time, I also need to trust in their abilities to get things done, more than trying to be on top of their work as well.

Overall, the Data Science Project was an educational experience in which I learned a lot from. Coming into the project, I was maybe too eager or optimistic, and thought I could do more than I could, and didn't consider elements that could slow progress down. This links to my first area of struggle of doing too much. Secondly, I learnt that even if the group is in order from the industry side, we must consider a lot from them, as we had many issues with getting our hands on the

dataset which delayed our progress. For the future, having maybe a dedicated meeting to understand what is required from both ends would prove useful.

In summary of this reflection for next time I will work more on what I and our group can do and plan for delays that may happen as well as try to mitigate them with proper communication.

Isabelle's reflection

The Data Science Project was something that I was quite nervous about, given my coding abilities. I was intrigued to take part in a real-world project that could be useful to a business, however, was worried about the challenges that come with working in a team and dealing with stakeholders regularly.

I feel my strong suit was in communication. I was sufficient at organising the team, meetings and ensuring that everyone was on task so that deadlines can be met. Meetings were always set with Basketball Victoria also by myself, which I feel contributed greatly in the success of the project, and demonstrated our professionalism as a team. I am also proud of myself taking initiative to cover the front end UI, and implementing it into the dashboard, as it is something that is outside of my comfort zone given my coding abilities. I think I was able to work well with the team to produce and implement a design that everyone was happy with. I surprised myself most in assisting in debugging with Aiden. I further took on the responsibility to assist Aiden in the code debugging as we were receiving feedback from Basketball Victoria, which allowed me to learn a lot about Python and Streamlit.

To improve for next time, I would reduce the amount of unnecessary communication I had made within the team, as during some weeks, we were communicating daily, and then wouldn't have much to discuss during our virtual meeting. Additionally, I would have ensured to really have the stakeholders provide exactly what they envisioned for the project, as I feel the dashboard features changed quite drastically week by week, as we were not on the same page, which resulted in more work. I also would make more of an effort to reach out to other team member's and have them contribute more.

Overall, this project has really allowed me to learn the depths of my management skills, and have also allowed me to develop Python and Streamlit abilities along the way. I definitely think it has changed my view on teamwork, as I feel for the most part, our team worked well through obstacles. For future, I would work on how I view these obstacles, as often I would feel quite defeated after we had implemented so much work. To resolve this, I would express this to my team members and brainstorm ways to fix these issues rather than overcomplicating things in my head.

Ben's reflection

At the beginning of this Data Science Project, I felt excited. I was looking forward to applying my technical skills to a real world problem with industry relevance, but I also knew there would be challenges in balancing collaboration, coding, and meeting the industry partners expectations. My main contribution to the project was focused on Dataset cleaning and preparation. I took ownership of this area and made sure the outputs were reliable and aligned with the stakeholder's evolving needs. One of the highlights for me was being able to sharpen my python skills and showcase my abilities. This was quite rewarding especially after seeing the product.

As I predicted I ran into a lot of errors with my code which required lots of trouble shooting and Research with websites such as StackOverflow, GeeksforGeeks and W3schools. However, this helped me improve my Python skills and problem-solving abilities and taught me the importance of communication when technical decisions and delays impact the backend team (Aiden) or stakeholder deliverables. In terms of team dynamics, I think I worked well with others particularly when integrating our contributions and keeping the team updated with what I was doing. I was often in communication with Aiden on backend logic, and I also collaborated with Isabelle to ensure the UI reflected what was happening behind the scenes. I appreciated Aiden's dedication to

collaborate, especially hopping on calls after university hours and I also would like to give credit to Isabelle for leading communication organising calls with Basketball Victoria.

Looking back, one of the biggest challenges we faced early on was the delay in communication with Basketball Victoria. We couldn't hold an initial meeting with them until well after the project began, which left our team without a clear direction in the early stages and a week or 2 behind. A major delay in my role came from the significant delay in receiving the datasets from their end, which pushed back my work on data cleaning, transformation, and dataset building. Since much of our dashboard depended on these datasets, this impacted the entire pipeline. There was also a lack of clarity around what the final dashboard and datasets should look like. As a result, we found ourselves making major changes and even making new datasets very late into the project timeline. For future projects, clearer and more communication between both parties and basketball Victoria knowing what they wanted from the start would help align expectations, avoid rework, and allow the team to plan with more confidence.

All things considered, this project helped me improve not just my technical abilities but also my ability to work with others in a team under pressure. In addition to feeling more comfortable using tools like Python, Streamlit, and Git in an industry-style workflow, I realised how important planning and communication is and I'm proud of how we were able to provide a professional, interactive dashboard that satisfied the expectations of the stakeholders.

Aashish's reflection

This project gave me the chance to contribute to both the technical and report side of real world data science task. I was especially interested in working with an industry partner and help deliver something meaningful to Basketball Victoria

One of my key contributions was leading the report writing and presentation development. I structured the report and worked on sections like the introduction, software evaluation and more. I also created and organised our final presentation slides to clearly communicate our process and results. Alongside that, I led the research and implementation of AWS hosting using EC2 which ensures the dashboard could be deployed reliably beyond the classroom setting. I also wrote a detailed step by step AWS development guide tailored for Basketball Victoria.

Another strength was team communications and support. While I wasn't the main stakeholder in contact, I helped align the team with shared goals through report planning, slide coordination, and technical documentation. I worked with Aiden to ensure that the AWS deployment matches the backend logic.

That said I do wish I could have contributed more to the coding side of the project. While I did handle the AWS and documentation, my coding skills weren't on the same level as some of my teammates. This is something I'd like to improve on in the future so I can better support the team technically as well.

I did have some challenges especially around the AWS setup which took a lot more time than expected. I eventually resolved those problems, but I've learned the importance of factoring in technical delays and leaving time for trial and error. At times I also over edited sections of the report which may have made collaboration less seamless. In future group work I'd focus on being more flexible and keeping contributions modular.

Overall, this project helped me grow in both communication and technical confidence. I now feel more comfortable with cloud development and team coordination and I am proud of the final dashboard we have delivered as a team.