COSC3043 - Data Science Project - Project Proposal - Report

Specification of Data Science Project: Scope and Deliverables

Basketball Victoria - Data Organisation and Dashboard

Group P000151DSUG:
- Aiden Tsui, s4005768
- Isabelle Delija, s4005575
- Ben Nanayakkara, s4008822
- Aashish Thoutam, s4009168

Industry supervisor
- Andrew (Ted) West

Academic supervisor
- Fatemeh Shiri

Artwork 'Sentient' by Hollie Johnson

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.

Partner/Client

The client for this project is Basketball Victoria, a 'not-for-profit organisation' (Basketball Victoria, n.d) who act as the governing body for basketball in Victoria. Being in the sporting industry, Basketball Victoria organise basketball competitions and leagues across the state, offer programs for individuals as well as schools, and provide pathways for elite athletes to excel in the sport; providing a central hub to all things basketball related for Victorian people.

Their mission is to 'encourage, promote, manage and control the sport of Basketball in Victoria' (Basketball Victoria, n.d), along with, at a national level, supporting players. Through prioritising positive values within basketball involvement, the organisation strives to ensure that the sport is accessible to all Victorians.

Basketball Victoria collects a large amount of data, including player statistics and competition information, from their numerous basketball competitions and progress within Victoria. Given the increasing participation of the sport, data volume too increases, posing challenges in data storage, and analysis. Their interest in data science is heavily fuelled by the need to efficiently store and process their data, along with having the ability to produce usable analytics to gain statistics for players and teams, to assist in installing improvements across the sport.

This project will be of value to Basketball Victoria, by providing a singular platform for coaches, players, and basketball enthusiasts to view basketball statistics and totals. The platform will combine the current data Basketball Victoria has, across various data sources, into one, user-friendly dashboard, allowing stakeholders to delve into basketball statistics, and allow coaches to make more informed player decisions.

The current business problem that Basketball Victoria has, is data stored on multiple sources, as well as nowhere to display this data in a combined manner. This reduces the game's analytics, disabling coaches or staff to efficiently pull player data, or even past players, who are unable to find their game information, due to the current system only displaying more recent data. This not only places strain on the basketball community as player's past efforts are not recognised, it also presents a missed opportunity for engagement.

Background, Definitions, References

Due to breakthroughs in technology over the recent years, the role of data science and analytics in sports has expanded dramatically with both professional and amateur sporting organisations leveraging data to help with enhancing performance, fan engagement and organisational efficiency. Hence why Basketball Victoria, which is the governing body for basketball throughout Victoria, is perfectly positioned to benefit from all the great data science practices which aims to help improve the management of player statistics, league performance and community engagement.

The increasing participation in basketball has led to a substantial growth in the overall total data being collected which includes and is not limited to, player statistics, game results, team performances and individual player development metrics. However, if there is no system for data organisation and visualisation, all the information which has power to cause positive change will go to waste and remain underutilised. This project aims to address the gap by building a structured,

user-friendly dashboard that transforms raw data into presentable and understandable data that players, coaches and organisations may use to make meaningful and informed decisions.

Data Cleaning is a critical first step in the data science workflow. Within data cleaning we will identify and correct or potentially remove all of the errors and inconsistencies in data to improve its quality and usability. Without cleansed data, the analytical outputs will be unreliable and misleading.

Data Visualisation plays a great role in turning complex datasets into understandable and actionable insights. Dashboards allows all the users to interact with visualised data through filters, search tools and other UI components that we may implement. A well designed and integrated dashboard should clearly communicate the key performance indicators and help users to make informed decisions quickly.

Dashboards in sports have gained traction due to their potential to inform coaching strategies, monitor athlete development and boost audience engagement. This is all done by creating an interface that highlights player progression and team achievements, in which organisations like Basketball Victoria, can use to strengthen their community ties and provide value to stakeholders, players, coaches, fans and even administrators.

The success of this project all depends on the implementation of the **Agile Methodology**. The Agile method focuses on iterative development and continuous feedback. This approach ensures that the dashboard evolves to meet basketball Victoria's needs, while also ensuring to incorporate stakeholder input throughout the process.

The project also makes sure to be in line with data governance practices, ensuring that the dashboard not only serves present needs but is also designed with scalability and maintainability in mind. Through proper documentation and handover procedures, Basketball Victoria will be empowered to independently operate and update the dashboard post project.

DEFINITIONS:

Data Cleaning: The process of identifying and correcting (or removing) corrupt, inaccurate, or irrelevant records from a dataset, table, or database (Wikipedia Contributors, 2019).

Dashboard: A ‘way of displaying various types of visual data in one place’ (Tableau, 2024) providing access to various functionality features.

Agile Methodology: An approach that divides work into phases, emphasizing continuous delivery and improvement. The Agile methodology benefits teams by enabling adaptive planning, rapid execution, and ongoing evaluation, leading to more responsive and successful outcomes (Atlassian, 2020).

Data Visualisation: The representation of data through use of common graphics, such as charts, plots, infographics and even animations (ibm, 2019).

Project Aims

The main goal of this project is to enhance Basketball Victoria's player data visualisation and accessibility through the development of an interactive dashboard and a structured data organisation platform. This project will enable efficient data storage, retrieval, and visualisation, benefiting players, coaches, and other people within the organisation by making key performance metrics and historical data more accessible.

Aim 1 (A1): One of Basketball Victoria's main worries is that long term player contributions often go unrecognised, and there is currently no streamlined way to highlight and celebrate players achievements over their careers. By having this dashboard in place, players career stats for past and current players (if current player data is accessible) will be accurately recorded and shown, allowing the community to recognise their lasting influence in their respective leagues. By improving player recognition and encouraging a stronger sense of accomplishment and nostalgia, this project aims to improve relationships among players, teams, and the larger basketball community.

Aim 2 (A2): The 2nd objective would be to turn the dashboard into a website that is accessible to the public, like others in the industry such as ESPN or Basketball Reference, so that external users can view player records, statistics in addition to those within the organisation. In addition to connecting the community and promoting the sport, this would create a historical archive for Basketball Victoria.

Aim 3 (A3): The 3rd objective is to make our dashboard/website updatable for recent games and statistics at the rate they wish to update it whether it be after every game or season etc. We Aim to provide Basketball Victoria with a set of instructions on how to maintain and update the dashboard/website with new data.

Expected Outcomes/Deliverables

Expected outcomes

-Positive user feedback and reviews:
Users who now have the ability to easily view and analyse their statistics could lead to increased engagement and satisfaction.
-Data-driven decision-making:
Aside from regular users, specific users such as coaches and players would now have access to insights, helping them track progress and make data driven decisions.
-Greater community engagement:
By showcasing player statistics and achievements, Basketball Victoria can foster a stronger sense of community and nostalgia for past players.
-Improved retention and participation:
A structured display of players historical records may encourage players to stay engaged in the sport and track their progress over time.

Project deliverable

We have split our project so that we have 3 areas that need to be completed so that our project can be deemed a success. We have defined our project deliverable as physical or tangible items that basketball Victoria can then use. These deliverables include:

(P1) The first project deliverable is a cleansed and organised Excel document. This step involves taking the data that Basketball Victoria have given us and undertake data cleaning and data preparation phases. This applies for both data sets. Next is to get the document ready for the dashboard. The new data documents should also allow for Basketball Victoria's continuation and expansion (A2).

(P2) The second project deliverable is the creation of a functional dashboard that can sort and filter through a database for its users. This is to make (P1) into a user interactive tool, to take all the data that they have and allow their users to search and refine for what key elements they make look for. The design should satisfy Basketball Victoria’s Aims (A1, A2).

(P3) The third project deliverable goes with (A3) of Basketball Victoria’s wish to add new data to the dashboard. The deliverable is a document of operations which allows Basketball Victoria to maintain the code for the dashboard and instruct how to update the database and code when needed. This deliverable focuses on the continuation of the dashboard after the contract between Group P000151DSUG and Basketball Victoria has ended (A3).

Measurement of success

In order for (P1) to be deemed successful it will have fulfilled (A2)

- Data is compatible with back-end code
- Data is clean and organised
- Data is able to be expanded on

In order for (P2) to be deemed successful it will have fulfilled (A1,A2)

- Users are able to filter and sort data
- Dashboard UI and design meets basketball Victoria's expectations
- Dashboard back-end code functions

In order for (P3) to be deemed successful it will have fulfilled (A3)

- Basketball Victoria is able to operate code independently
- Basketball Vicotria is able to add the dashboard to their website

Resources/ Stakeholders

Resources

Technical resources

- Visual studio code
- GitHub
- Trello
- Microsoft
- OnlineGantt

Technical software

- Python
- SQL

Stakeholders

- Basketball Victoria
- Players
- Coaches
- Administrators
- People with an interest in basketball

Stakeholder engagement

- We will be communicating with basketball Victoria via Ted out industry partner, this will be through our teams meeting or through WhatsApp.
- We plan on having interviews with the players, to talk about the UI design and what they want.
- We plan on having interviews with the coaches, what they might use our dashboard for and what features they might want.

Project Plan

Method to satisfy aims and deliverables

- To satisfy P1, P2, P3 we will use an agile approach to ensure the project is delivered
- To satisfy our aims we will communicate as a team and with our industry partner to build up necessary knowledge
- To satisfy our project, we will leverage such knowledge to build our project deliverables

Project Milestones

1.Getting started

- 1.1 setting up communication
- 1.2 setting up software

- 1.3 deciding agile methodology
2.Planning
- 2.1 understanding basketball Victoria's needs
- 2.2 ideation of soft and physical goals
- 2.3 finalisation of project deliverables
- 2.4 complete project proposal
3.Building
- 3.1 pre-process data
- 3.2 theorising code-based solutions
- 3.3 commence data preparation
- 3.4 commence back-end cade
- 3.5 commence front-end code
- 3.6 debugging
4.Testing
- 4.1 test code
- 4.2 fix code
- 4.3 final test
- 4.4 final adjustment
5.finalisation
- 5.1 group review
- 5.2 present to basketball Victoria
- 5.3 prepare presentation
- 5.4 done/ submission

Project Timeline

Milestone 1: Getting Started
- Completed by Week 3

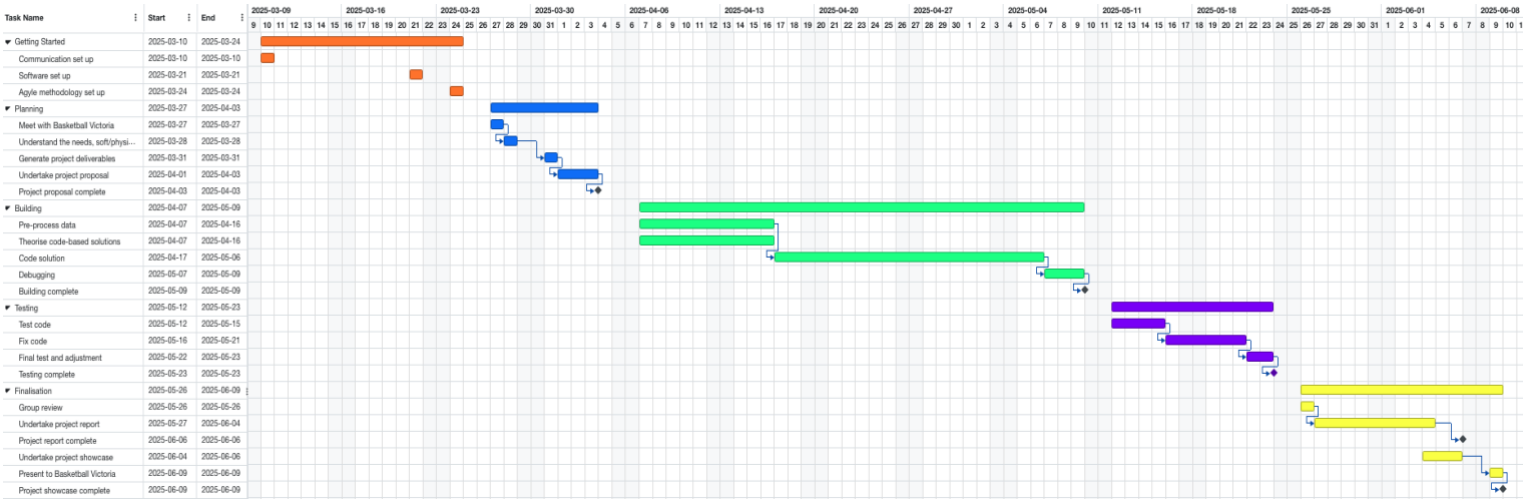
Milestone 2: Planning
- Completed by Week 5

Milestone 3: Building
- Completed by Week 10

Milestone 4: Testing
- Completed by Week 11

Milestone 5: Finalisation
- Completed by Week 13

Gantt chart



Team member roles

Student ID	Name	Role	Description
s4005768	Aiden	Back end leader	Maintain Trello board, maintain git-hub, back-end code
s4005575	Isabelle	Communication leader	Maintain Gantt Chart, client research, UI design, group organisation (regular check-ups, teams management)
S4008822	Ben	Data scientist	Data preparation and cleaning, back end-end code, project aims, design
s4009168	Aashish	Flex member	Background, definitions, UI design, assist all team-members

Team member tasks

- Trello: https://trello.com/invite/b/67dfb2b8530833b2e8802ac1/ATTIf13f9576f97e8fe5f0b5ec52e17cc96e3619A34C/data-science-project

Risk management

Potential risks	solution
Level 1 IT issues (software issues)	-Allocate another day or two -speak to team members
Level 2 IT issues (computer issues)	-level 1 solutions -Message academic supervisor
Level 3 IT issues (cannot do any online work)	-level 2 solutions -Team member reallocation -message industry supervisor
Behind schedule	-Reduce workload -reduce expectations
Industry side issues	-group meeting with industry partner -message academic supervisor
Communication	-main, Microsoft teams -back up, discord, WhatsApp
Team work level 1	-direct messages -direct emails
Team work level 2	-group meetings -academic supervisor

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