Title [1, p. 19]

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IFN703 Assessment 1

# Abstract [1, Ch. 3]

This is a template for IFN703/4 Assessment 1, a *“Written project plan providing a description of the background, aim, significance, expected deliverables and development schedule of the project.”*

Introduction [1, p. 28]

The continuous increase in computer capabilities has brought data analytics as a key companion for decision-makers in all areas of business and society. In the sports landscape, the study of on-the-field action reflects an increase in the adoption of data analysis. Sports have an important quantitative aspect. Be it in team or individual events, games are won or lost on the basis of scores. Actions such as goals, tackles, and distance covered are all quantitative measures that help describe a game and the performance of a team or a player. Data analytics takes such measurements and derives qualitative information that can then help inform game decisions. Instead of relying on general wisdom, it is now more common to apply the scientific method in order to disentangle what can be perceived as a good approach from the reality of what actions could lead to the desired outcome. Data collection and analysis are useful tools that can be used to inform decisions by multiple stakeholders, including coaches, trainers, managers, or even players.

The enthusiasm for sports analytics has been building since 1950 and emerged from distinct communities: operations researchers, freelance sports journalists, and internet hobbyists [2]. "Operations Research" was a new branch of warfare in which statisticians analyzed military operations to improve their efficiency. And what better thing could those OR officers do than apply their knowledge to various sports? A 1959 article from a Royal Canadian Air Force officer, for example, described how right-handed batters had a higher batting average against left-handed pitchers, and vice versa [3]. He naturally suggested that managers should substitute a player depending on the handedness of the opposing pitcher. Baseball focused a lot of interest from statisticians in the 1970s in the US through, not exclusively, the Society for Baseball Research founded in 1971, and the movement never lost momentum. In the nineties, it was the turn of American football with the publication of the pivotal work "The Hidden Game of Football" in 1988. This work illustrates the creation and use of performance metrics, such as expected points depending on the position on the field.

Booming in North America, the rest of the world was not ignorant. Charles Reep, a former wing-commander in Britain’s Royal Air Force, dismayed by the poor performance of his beloved Swindon team, started recording game actions on a notepad. This led to the study of more than 578 soccer games between 1953 and 1967 and can be seen as the spark of game analysis in football. Rugby is a close-contact team "invasion" sport, in which teams try to infiltrate the opposition’s territory to score a goal. A team is composed of 15 players, using an oval-shaped ball on a rectangular field. Born in 1845 in England, it was split into rugby league and rugby union in 1895. Rugby Union remained an amateur sport until 1995 when the International Rugby Board declared it a professional sport.

Compared to the other sports mentioned previously, rugby is a relatively new federation. Since then, it has garnered interest worldwide, which has increased the need for performance analysis and game modeling.

The data collected can be separated into two categories: the sport-specific functional components or technical skills, such as working out ways to offload the ball or capture it. This helps coaches understand how different aspects of the game unfold. Notational analyses at the team level can help describe collective behavior and outcomes, such as match success.

Modeling game outcomes is an increasingly popular endeavor, whether for managers or betting companies. Prediction and modeling in rugby league have increased in prevalence since the professionalization of the sport and the constant growth of revenue.

We also observe wider access to sports betting, which requires increasingly complex models to offer more intricate bets. However, little work has been done in rugby union to model game outcomes. This can be attributed to the lower amount of data available compared to other sports, such as soccer.

Litterature Review [1, Ch. 4]

In general, your report should conform to the Research Proposal style set out by Silyn-Roberts [1, Ch. 5] (note that this reference is available from the QUT library) including:

* a Title [1, p. 19]
* an Abstract [1, Ch. 3]
* an Introduction [1, p. 28]
* a Literature Review [1, Ch. 4]. This is relevant to defining the project scope and could include review of methods as well as the topic domain
* the body of the report, in which you should present your
  + Project definition: what you intend to do,
    - e.g., a *“...description of the expected stages of the research and an outline of the techniques you expect to use during each one. It may be effective to describe each expected stage and its procedures under an appropriate series of headings”* [1, Ch. 5]
  + Project plan: how you intend to do it (your project)
    - *“For those topics that are less well defined (such as Ph.D. projects and projects where you will follow research leads and possibly construct equipment or devise methods of which you may not have any clear idea at present):  
      State clearly how you propose to tackle the first stages of the project.*

*Then follow with a reasoned description of the framework that the research is likely to follow and the possible procedures that may be needed.”* [1, Ch. 5]

* + Time planning [1, p. 33]
* References [1, Ch. 15], [4]
  + Please use IEEE style referencing
  + We strongly encourage using bibliography management software (e.g., [Zotero](https://www.zotero.org/) [5]) to automate citation and bibliography generation.

# More guidance for your project plan

This purpose of your plan is

* to show that you have a clear idea of previous work in the area, the research problem and the procedures you will use to tackle it
* to convince someone else (e.g., your client/collaborator/partner) that your work will be of value.

*“Design your [proposal] with both specialists and non-specialists in mind”* [1, p. 78]

* *"Embedding your detail within a framework of cleverly designed headings, subheadings and listed points will make it much more easily accessible to all your assessors, both specialist and non-specialist.*
* *It is a much greater achievement to be able to design a readily navigable document with a clear logical pathway – the red thread – through it, than to bombard your assessors with solid detail"*

## Use of Microsoft Word styles

**Please use, but do not change the styles of this template in your report**. They are deliberately plain.

If you do not know what Microsoft Word® styles are, or how to use them, please visit <https://support.office.com/en-us/article/Style-basics-in-Word-d382f84d-5c38-4444-98a5-9cbb6ede1ba4>.

## Length of report

Your plan should be as long as you think you need to successfully communicate your intentions. It is important that your plan has a logical flow of ideas, i.e., tells a meaningful "story". You should strike an effective balance between detail and meaning... and the reader's attention span. Our guess is that this will involve around 5-10 pages of text references, appendices and figures.

## Use of figures and tables

Microsoft Word® is good at many things. Unfortunately, placing figures and tables is not one of them. Our advice is to place figures and tables after you are satisfied with the text.

Follow Silyn-Roberts’ [1] guidelines on Illustrations for figures (p.44) and tables (p.47). All figures and tables should be captioned using Word’s captioning (see <https://support.office.com/en-us/article/Add-captions-in-Word-82fa82a4-f0f3-438f-a422-34bb5cef9c81>) like this:

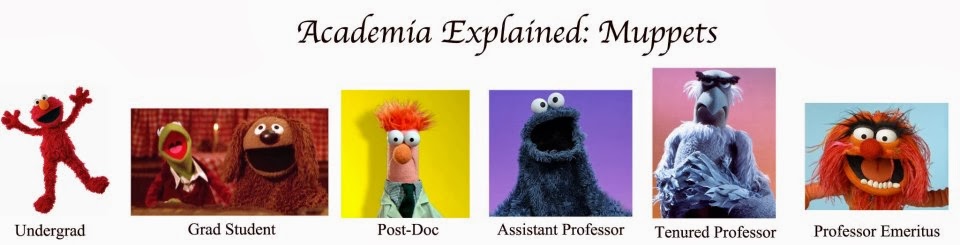


Figure 1. Academics come in all shapes and sizes; however, they are generally not as funny as Muppets.

|  |  |  |
| --- | --- | --- |
| Academic Level | Title | Analogous Muppet |
| A | Associate Lecturer | Robin (Kermit’s nephew) |
| B | Lecturer | Scooter |
| C | Senior Lecturer | Fozzie Bear |
| D | Assistant Professor | Cookie Monster |
| E | Professor | Sam the Eagle |

Table 1. Existing academic-Muppet analogues (Levels D and E) plus conjectured analogues (Levels A-C) for the Australian academic system.

## Use of bulleted lists

Bulleted lists should use the basic Word style as follows:

* First level item
  + Second level item
* First level item.

## Use of numbered lists

Numbered lists should use the basic Word style as follows:

1. First level item
   1. Second level item
2. First level item.

## Headers and footers

Please replace the existing page header with the title of your report, or a shortened version thereof.

Please do not change the page footer.

## How to help readers navigate their way through your document

Silyn-Roberts [1, p. 11] has useful advice on this topic suggesting that the document and its sections start and end with information that is brief, focused and concise.

# References

[1] H. Silyn-Roberts, *Writing for science and engineering: papers, presentations, and reports*, Second edition. in Elsevier insights. Amsterdam: Elsevier, 2013.

[2] E. Hintz, ‘Sports Analytics Before Moneyball’, Smithsonian, Museum of American History. [Online]. Available: https://invention.si.edu/sports-analytics-moneyball

[3] G. R. Lindsey, ‘Statistical Data Useful for the Operation of a Baseball Team’, *Oper. Res.*, vol. 7, no. 2, pp. 197–207, 1959.

[4] ‘QUT cite|write - QUT cite’. Accessed: Jun. 20, 2016. [Online]. Available: http://www.citewrite.qut.edu.au/cite/

[5] Various authors, *Zotero*. Roy Rosenzweig Center for History and New Media, 2020. [Online]. Available: https://www.zotero.org/