



BRITISHROWING

SAS Ranking Points Index

Optimisation Project



TEAMWORK | OPEN TO ALL | COMMITMENT



Background

The new British Rowing Competition Framework (the “[framework](#)”) ¹ and associated Ranking Points Index (“RPI”) was launched in April 2018 for all British Rowing-affiliated competitions, after many years of discussion and the completion of a pilot phase from late 2016.

This replaced the 0-12 point system which governed racing members from novice up to Olympic standard. Whilst this operated for many years, it was widely recognised that such a small scale failed to meet the requirements for a wide and diverse racing community. As such, a broader, more granular approach was developed through the new framework which would allow the middle tiers of racing to find their appropriate level, rather than being grouped with Olympians and novices.

Within the “old” points system, crews were sub-divided according to the number of events (a series of races) won, regardless of the experience or quality of the opposition.

Rowing is split into two different styles of racing; either processional (head racing) or head-to-head (regattas). Heads have the advantage that all the crews are timed down a course and so can be generally compared directly whereas regattas are a series of races where crews have to do enough to get through to the next round or win, normally these are not timed and so only win/lose information is available.

Objectives

The objectives for the new system were to help create closer, fairer and more exciting racing, whilst also encouraging new members to start and continue racing from early in the season (in support of head races). The objectives were also to allow people to return to the sport at a lower level as the old system only allowed a return at a relatively high standard when points had been awarded.

Options

Alternative systems

Whilst many ranking systems exist, and have been used in other sports, they are not necessarily well suited to the dynamics of rowing, which must take account of varying field entry size, differing crew compositions, boat sizes, weather systems and water current flow. The more complex

¹ <https://www.britishrowing.org/events/competition-framework>

results from side-by-side racing at regattas, versus time trials over a head race in differing crews was also taken into consideration.

Measurement method; quality or quantity?

In addition, the objective of the framework was not to determine how much faster a crew is than another so as to predict the margin by which they might win but was instead to have the ability to group crews of approximately the same standard to race each other. Given the unpredictability of racing conditions and the additional burden that would be placed on competition organisers at regattas trying to glean marginal information to measure the quality of a crew, the objectives remained realistic and would use existing race data.

Development of the system

As a result, a ranking system was created to enable crews to be banded (grouped) in competitions more accurately but also to encourage them to compete more regularly. This is in contrast to other systems which have been widely used such as ELO or [GLICKO](http://www.glicko.net/glicko/glicko.pdf)², which derive rankings primarily based on single one-v-one results, and are particularly suited to competitions such as chess where the scenario is very different and more simplistic.

During the initial investigation and discovery phases, a large amount of consultation was carried out with the competitions, clubs and members of British Rowing and the concepts and principles were refined. Hard facts, however, were not easily obtained so most of the concepts and principles came from experience of the members of the working group made up of senior volunteers from the sport and experienced staff at British Rowing. It was agreed that changes to the system would only be made based on empirical information.

Following the trial phase (dates), changes have been implemented to points awarded at regattas, to create a system that is more reflective of the field variations of regattas. During the first year of its roll out, British Rowing has been working with SAS to assess the suitability of the framework and to conduct a peer review of the underlying algorithm. Using SAS' proven approach to the life cycle of data analytics, British Rowing has been able to call upon its unique partnership with SAS to access expertise from within the analytics industry.

² <http://www.glicko.net/glicko/glicko.pdf>

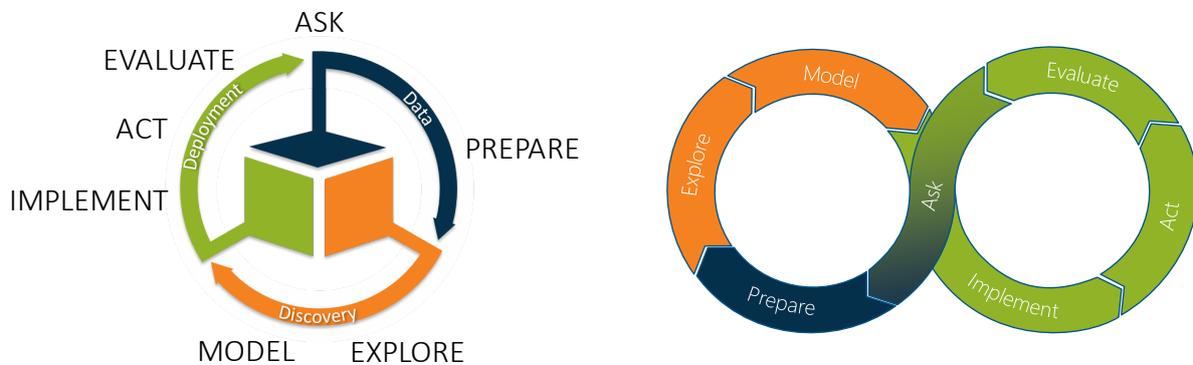


Fig. 1: SAS 7-stage data analytics life cycle

Project scope

Using the historical data together with a full season of results from 2018, segregated as regattas and heads, a team comprising a SAS senior data scientist and analytics experts have sought to understand how well the developed ranking system is performing. In particular, with what accuracy the results of a race can be predicted, based upon the incoming Crew Ranking Index (CRI), i.e. does a crew's ranking points (the sum of the individual crew members' Personal Ranking Index) give a good indicator of likely placing, ahead of the event? If so, what level of accuracy could be achieved? This was aimed at benchmarking the existing model to understand whether further development or optimisation would be required.

Benchmark

As one of the aims of the ranking system was not to absolutely predict the result of a given race but to make sure that crews would experience "tight, exciting" racing, a reference measure was needed to estimate the accuracy of the ranking index. Given that the old points system split crews up into six levels, of which five levels were common, it was agreed that the framework should be assessed against whether it could predict placing to within 20%. This would serve to quickly recognise if the framework was providing a means to accurately band crews but at the same time would highlight any outliers.

With incoming competition results, subsequent points awarded and crew composition sourced from BROE2 (British Rowing's Online Entry system), SAS has looked to establish any trends across a season, club, competition or event. Using SAS' Data Management and Visual Analytics platforms, insight has been gleaned which previously would have not been seen.

Findings

In consideration of the 20% target, the findings have been very positive. Most events have achieved this with more than 16,000 crews racing in 2018 falling within this target.

Looking at an example subset of the data for all masters' events the same pattern emerges with good accuracy for at least 70% crews which is even more encouraging given the smaller field sizes.

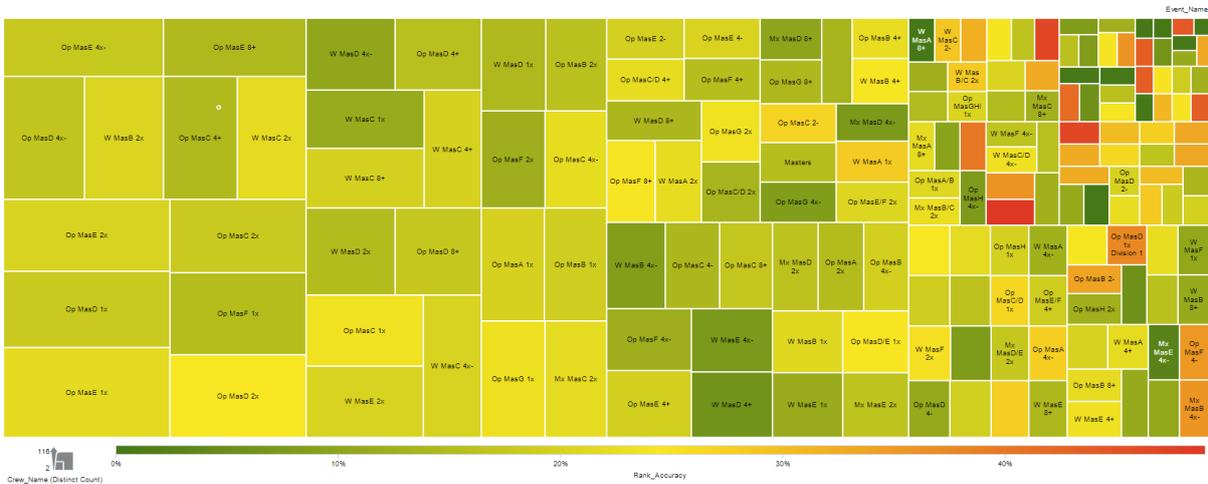


Fig. 2: Accuracy across Masters' events in 2018

Heads versus Regattas

Head races, in particular, with placings based upon a relatively straight forward time trial could be predicted more accurately (average 17% in 2018). For regattas where overall placings are more complex, especially in two lane events where potentially high ranking crews may be unplaced after being knocked out in the first round, it has been possible to identify some outliers; one region in particular (West Region) where the number of British Rowing-affiliated competitions is low, and crews have limited exposure to gain points are consistently outside the 20%. Consideration has also been given to the positioning of regatta 'zero' point finishers so as to glean more information from the results. In consultation with the National Competitions Committee, it is hoped that going forward, additional data might be incorporated into regatta event results.

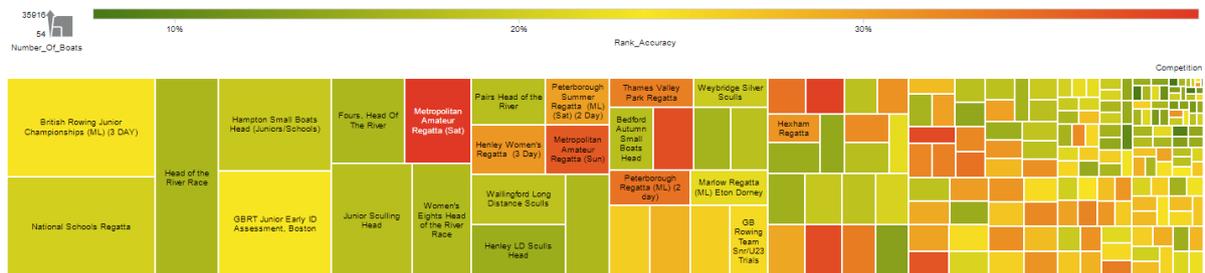


Fig. 3: Distribution of prediction accuracy by competition

Data quality

Whilst the results are promising, they also highlighted that although the information from competitions was generally of a good quality, there was a problem in placing results for two lane regattas due to the BROE2 calculation. It was calculating the ranking points allocation correctly but was incorrectly calculating the overall position for two lane competitions (the majority of regatta races in England). This has not only led to a revision of the positioning calculation but has also triggered further consideration of regatta placings and points.

Competing at the right level?

With an individual's points being calculated over eight events and fade factor attributed to time, it is possible to see that the more active crews (those that are able to compete at least eight times per year across a full season with both head and regatta entries) are seeing their individual points average over a single, full season with an improving rank accuracy at each competition. This is occurring for those with high, medium and low PRI.

Given that some individuals are entering more than 15 events per year (with a combination of sculling and rowing), the anomalies previously seen by hand picking events to avoid / gain points are being ruled out, with PRI (and subsequent competition entry points) no longer heavily dependent on a single result from a single competition but instead being normalised over a season. At the same time, competitions are now restricting both upper and lower entry levels based on CRI to ensure that equivalent crews are competing at the right level.

The analysis has also confirmed that the loading of points to head races, which are based on a type of boat in a division versus a regatta where they are calculated over an event, has generally given closer races earlier in the season than the previous system.

Conclusion

In addition to the above, the prediction accuracy for regular racers is improving year on year. With this stability, the provision of more data over time and potentially more insight from regattas through an increased dataset, it is feasible for a crew's quality to be further understood, assessed and incorporated. At this early stage, however, a quantity measure, based on the number of crews is providing the level of accuracy required to create closer banded competition, fairer and more exciting racing.

With the first stage of the review completed, SAS has confirmed that the framework is providing a prediction accuracy that is appropriate for its needs. As with any system, there is always scope for optimisation however this must be balanced against the requirements placed upon it.

Next steps

Going forward, with a second full season of data, it is intended to further consider how crews hold their ranking points with time, and confirm the rate of convergence. Patterns are already emerging as to those clubs and crews that have moved up the ranking point tables quickly.

In addition, consideration will be given as to how well GB Rowing Team rowers fit within the system given the allocation for international representation. Assuming the fit is as expected then it may be feasible for movement and positioning of an individual's points to become a factor in consideration for pathway recruitment.

To find out more about the project or to discuss the findings with SAS, please feel free to contact annie.hairsine@britishrowing.org.

NOTES TO EDITORS

ABOUT SAS

SAS is the leader in analytics. Through innovative software and services, SAS empowers and inspires customers around the world to transform data into intelligence. SAS gives you THE POWER TO KNOW®.

ABOUT BRITISH ROWING

British Rowing, as the governing body for the sport, is responsible for the development of rowing in England and the training and selection of rowers to represent Great Britain.

Rowing has a proud history as one of GB's most continuously successful Olympic sports producing World, Olympic and Paralympic champions from across the UK. The GB Rowing Team is supported by the National Lottery Sports Fund.

Over 639,600 row, indoor or on-water, each month according to Sport England's Active Lives survey May 2017/18.

British Rowing's mission is to lead, enable and inspire excellence in rowing at all levels. Our vision, through rowing, is to promote the positive impact of sport by providing an enjoyable experience for all participants while upholding our position as a leading rowing nation.