

Unlocking the power of data

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Data analysis

- **Data analysis aims to provide marginal gains in performance.**
- **The complex principles and at times mindboggling models adopted are the realm of professional organisations and high performance coaches.**
- **Breakthroughs in player tracking devices have boosted the capability of performance data analysis.**
- **Having someone who can translate the data is the key, as is the need to root out heaps of useless information.**
- **Predicting the outcome of a contest can never be 100 per cent accurate.**

The search for ways of gaining a winning edge over the opposition is a relentless one for sports coaches, who operate in an environment where there are incredibly fine margins between success and failure.

Developing a tried and trusted shortcut to glory, a magical formula that provides your athlete or team with a measurable advantage over your rivals, is every coach's dream.

It just so happens that there is a 'magic wand' available to coaches that can accelerate individual improvement. Combining the use of technology with performance data analysis is a method many high-performance sports coaches swear by and, when used alongside the more traditional approaches of deliberate practice, good nutrition and innovative training techniques, it can have astounding results.

Of course, life is never as straightforward as that. This 'magic wand' comes with a very complex instruction manual (translating the data is an art form in itself), it can be expensive (some professional clubs employ whole teams of performance analysts) and there is a time factor involved (several seasons of data may need to be compiled before trends begin to emerge).

Drowning in data

Andrew Shelton provided a fascinating insight into life as a performance analyst in his lecture at the Sports Performance and Technology Summit in Manchester.

The former Head of Sports Science at Leicester Tigers RUFC, now working for Kitman Labs based in California, explained that using the minutiae of data provided by technology is the underpinning philosophy of how you develop athletes in modern-day professional sport.

Statistical analysis and the forensic evaluation of an individual's playing characteristics can result in marginal gains in performance – the idea that if you improve in every variable influencing your performance by just 1% then, cumulatively, you will see a significant improvement.

If you haven't worked it out already, this is a job for a professional.

While not entirely alien to amateur coaches, the world of performance analysis has little gaugeable benefit. Coaches can call on video technology to gain insight, develop ideas and spot performance flaws, but this is a drop in the ocean of what can be achieved by the analysis of – to use the current buzzword – ‘big data’, meaning data sets on a colossal scale.

To get the full benefit of performance analysis, it certainly helps if you have a degree in the subject, or in a related field like sports science or mathematics with statistics (and this isn’t intended as a tongue in cheek comment).

At first glance, the graphs, algorithms and principles at play will be mind-boggling to the layman, and you need to be clever enough to interpret all this data if you are to make any headway, and not drown in the ocean of statistics.

It is the analyst’s job to concoct a sophisticated performance model that works and then feed back the results to the coach so they can act upon the information served up. Only money-laden clubs will be able to afford to employ such a person (or team of people), a luxury that non-professional clubs can only contemplate in cloud cuckoo land.

A formula for success

So how does it all work?

Well, the basic idea is that micro sensors are placed on the players and equipment during games. These tracking devices provide an inordinate amount of data on player movement.

IBM has developed some big data analytics software, in association with the Rugby Football Union (RFU), called TryTracker, which allows clubs to dial up vast archives of historical statistics to use for predictive analysis.

Opta too has mined data from several seasons of competitive fixtures, which analysts can use as part of a performance formula to forecast the outcome of a game. Players’ strengths and weaknesses can also be observed, along with tactical behaviour.

Interestingly, FIFA does not allow the use of performance analysis technology during international games.

As Andrew explains in more detail: ‘Events occurring in rugby union include effective carries, positive carries, tackles, breakdown, kicks from hand and line-break percentage. Stats demonstrate the difference in effectiveness over all those events over several seasons in teams that win and lose.

‘The statistical breakdowns tell you that you may need to be more effective in certain areas than the opposition over the course of the season.

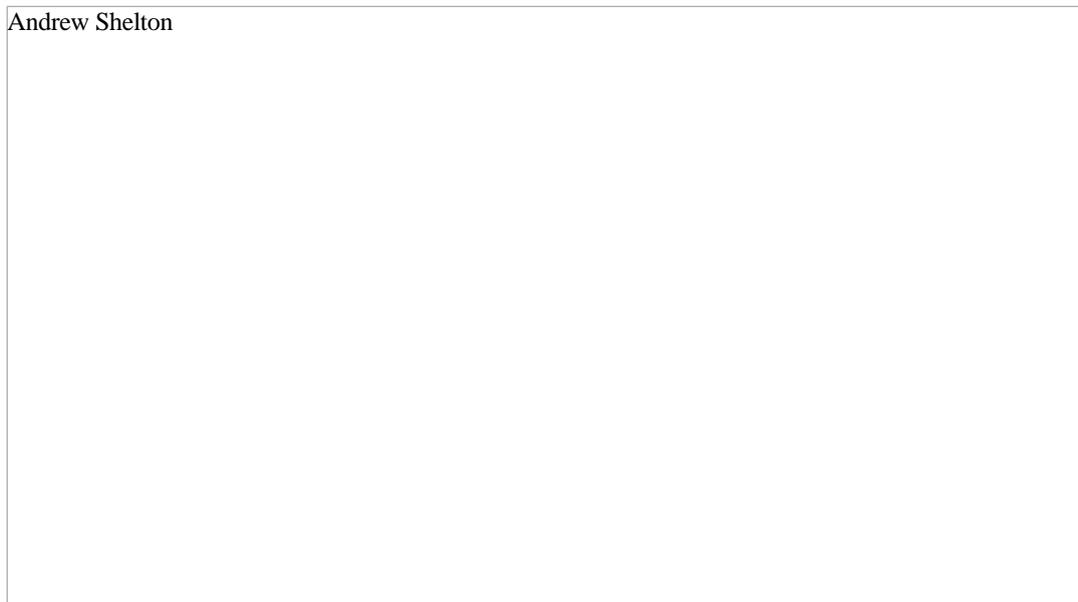
‘And they will even give you an indication of the points you will need over the season to achieve success and the number of wins you are likely to get.’

So by extrapolating the data it will become apparent, for example, that, while player x is on the field, he has more of a contribution in terms of try assists and tries scored than any other player on the team.

Translating the data is the key. There is no point having access to it if it cannot help you. It becomes a burden.

But once you know how to use it to effect and implement positive change, the magic of performance analysis becomes apparent.

Andrew Shelton



Building a winning team

Andrew highlights how statistic-based scouting influences player recruitment – another major advantage of performance analysis – throwing us into the realm of ‘Moneyball’, and Oakland Athletics baseball guru Billy Beane, as clubs work out a player's worth based on computer-generated statistical analysis.

‘You can use the huge amount of data to determine what leads up to a score,’ says Andrew. ‘Over the course of a season there will be obvious trends and you will be able to score each event as to how much it contributes to points being scored.

‘You can then analyse each player based on the scores you have from the season’s worth of data. That will tell you the likelihood of this player contributing to you winning a match on a game-by-game basis over the course of a season.’

This is all valuable information. Knowing what processes lead to a try and monitoring how each individual player best contributes to that enables you to build a winning team with no weak links, and devise a game-plan that gives you a clear performance advantage over your opposition.

No wonder Opta boasts on its website that it can ‘help coaches fine tune their performances, proficiently scout their opponents and effectively recruit new talent.’ It is not an exaggeration.

But some problems spring to mind. For example, if every club has a performance analyst, won’t they cancel each other out? Or perhaps some performance models are more effective than others.

Say, for example, I am a football coach who wants to find out if there is a parallel to draw between how far my players have run in a match and their chances of winning. You may work for days on this dilemma and then find there is no correlation. What a waste of time.

Or, you might think there is a pattern that emerges. But be wary, as sometimes there are just too many imponderables, rendering the results unreliable.

You might discover a trend whereby, when players run on average 10 miles in a game, the team has a tendency to win that game. If they run eight miles, they generally lose. But they may have ran 10 miles and lost because they have been chasing shadows for the whole 80 minutes as they were playing the best side in the division. Another time they have lost the game and ran 10 miles because the opposition were 19-0 in front after 10 minutes and sat back, inviting you to attack, attack, attack as you chased the game for 70 minutes. These exceptional circumstances skew the statistics.

There are lots of things that can play havoc with performance data (loss of hunger, desire, confidence or complacency, as illustrated currently by Chelsea’s dramatic loss of form in the Premier League), meaning predicting the outcome of a contest can never be 100% accurate.

Sorry if I have tied you up in knots with these ‘what if’ scenarios, but that’s what statistical analysis can do for you!

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GO FIGURE: Performance data analysis is not for the layman, as this strategy model shows

Take out the garbage

George Murray is Head Performance Analyst with Munster RFU.

He has devised a wholly different statistical model that uses data to drive strategy change at the club.

Munster were the kingpins of Europe not too long ago, winning the European Champions Cup, known then as the Heineken Cup, in the 2005-2006 and 2007-2008 seasons.

But when some of their star players retired, they were propelled into a transition period.

Murray explains: 'We wanted to know if data could make us better. How do we bring the players we have on to the next level, how do we recreate leadership, experience and enhance game sense and game management?'

The first thing Murray is keen to stress is that: 'data is a bunch of garbage if there is nobody able to interpret it.'

The key thing then when devising a formula is making sure you can get the message across to the coaches. If you tell them in one sentence: 'We will be integrating the information provided by the data effectively to enhance change,' you'd better be able to break it down for them in layman's terms the next time you open your mouth, if only to wipe the blank stare off their faces.

'You have to put it into a presentable model [for coaches]. Summarise the data into small detailed points. Make it tell a story.'

Murray explains the model they adopted: 'Territory, decision making, accuracy, execution, field position, possession – they are the principles of rugby. These are all important things in rugby that determine outcome.

'The idea is to evaluate our performance under these principles of play, to tie up all the information in a game into a model that will work to evaluate performance.'

Analysts break the field into five areas. Player tracking allows them to assess their use of possession through all those zonal parameters, both with and without the ball.

Opposition possession is also recorded so you can measure when you are outperforming them.

The upshot is that you can implement a grading structure for each of these 'principles of play' and can then begin to determine which elements contribute to the success or failure of each principle: physique; style of play; philosophy for example.

The performance analyst will assist the coach in assessing the styles and formations of the opposition, drawing up team profiling documents and game-plans. Presentations will be made to staff in the build-up and after games, and Murray will have a role to play during matches too.

'The coaches will be given access to the stats at half-time so they can draw on them in their team talk,' he explains.

Simple but effective

Leicester City Football Club's Academy uses a more simplistic model.

Head of Sports Science and Performance Analysis Kevin Paxton explains they have implemented a system of age-specific benchmarking through physiological testing and training data.

The idea is to provide an objective assessment of all players in line with identified key aspects of physical development, within specific phases, which can then be used to objectively review long-term success.

Kevin argues that number dyslexia can lead to confusion, which is why they use a basic system where each player is given a raw data score – a 1-5 rating, poor to excellent – on a number of different variables like speed, agility, endurance, strength and power.

The benchmarks are colour-coded so the table of results translates more easily to players.

'It is imperative data is reliable and valid in order to measure effective change,' says Kevin, who goes into more detail about the performance model.

'Players are scored season after season and the data collected in age-related chronological bands: under 10 and 11, under 12 and 13, all the way up to academy age.

'It enables long-term individual summary and review and provides an accumulative record of improvement in specific areas for each player and also the age group as a whole, so you can see if improvement has been made over the season.'

'Medics, coaches, players, parents, welfare officers, everyone finds this easy to understand.'

The key performance indicators (KPIs) become easily definable over time and you can measure who is falling short and in which areas extra work is needed.

Here to stay

Player performance reduced to statistical analysis; being able to predict future performance; spotting and ultimately exploiting flaws in the opposition's skill set; improving training programmes; driving individual and team improvement.

The sports purist may view the advent of data analytics as sacrilege but, love it or hate it, coaches cannot ignore it as the scientific concept is here to stay.

Others will welcome the advancement, eager to push the boundaries of what is possible when big data is used imaginatively in tandem with ingenious technological breakthroughs.

Will this mean the gradual phasing out of high performance coaches? That's a topic for another day, but I wouldn't bet on performance analysts replacing coaches in the dugout just yet if I were you.

What is your view on the advances in performance data analysis? Leave a comment below.

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