Deloitte.

Get ahead of the game
What businesses can
learn from the use of
analytics in sports

Analytics in sport

Whilst the hype around the power of "big data" has only just started to seep into oak-panelled boardrooms and onto the pages of the corporate executive agenda, sporting organisations have been at the forefront of exploiting data to gain a competitive advantage for many years.

From Formula 1™ to football, data has been at the heart of developing strategy, understanding the factors behind success and failure, assessing competitors' strengths and weaknesses, and measuring the impact of tactical changes. In the rarefied world of elite sport, even the tiniest of margins can make a difference, so data analysis – getting to the heart of what drives performance – has become critical. And as Lord Coe is reputed to have said "If you don't know why you failed, how can you improve? If you don't know why you succeeded, it must be an accident."

This point of view aims to highlight the lessons that business can learn from the way that sporting organisations have used data to derive a competitive advantage. This is not akin to a lazy after-dinner speaker trying to draw a tenuous link between success in business and what goes on in the inside of a scrum.

Data analysis and data-driven thinking are fields in which sporting organisations have genuinely led the way over the last decade, and it is no coincidence that those who have enjoyed success on the field of play, also happen to be the at the forefront of data exploitation.

Through interviews with experts from the world of football, cricket, athletics, rugby, cycling and Formula 1™, and through the work we have done with sporting clients, we have identified the secrets of their data-driven success.
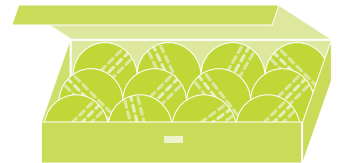
54

Specialist bowler James Anderson went 54 Test innings until his first duck before falling for nought to Ben Hilfenhaus in the 5th Ashes Test in 2009, longer than any other English batsman ever.

The need for data-driven decision making

33%

One third of all goals across the top five European football leagues are scored from set pieces.

Few would deny that using the information at your disposal to make an informed judgment is good sense. It just so happens that culturally, or technically, this has been quite challenging for many organisations.

Arguably the cultural barrier is more challenging. Most people simply don't use data as a way of forming an opinion, they use it as a way of justifying an opinion. As John Kenneth Galbraith, the renowned economist, once said: *"Faced with the choice between changing one's mind and proving there is no need to do so, almost everyone gets busy on the proof."*

Or as John Coulson of sports data company Opta points out, people can see evidence as a threat to their own point of view or methods: *"Initially most of the clubs saw data as a threat. Coaches were feeling 'what can data tell me that I don't already know?' rather than seeing it as a tool that can remove ambiguity and bias and give results to the coach to interpret."*

The technical barriers are not to be underestimated either. Many organisations have lost faith in their data due to suffering years of reports where numbers don't tally due to poorly integrated systems, or have not been able to hang around long enough for the Business Intelligence (BI) department to come up with anything insightful, so have developed a culture of making seat-of-the-pants judgment calls.

A recent article in the Harvard Business Review[1] talked about the need to move away from developing strategies based on the HiPPO (Highest Paid Person's Opinion), and towards data-driven decision making. In other words, making decisions based on fact, not the boss' sole judgment or gut instinct. It went so far as to say that companies in the top third of their industry in the use of data-driven decision making were, on average, 5% more productive and 6% more profitable than their competitors.

Whether those statistics demonstrate causation or correlation with data-driven decision making could be hotly debated by many a data scientist, but the assertion still rings true.

In stressing the importance of being able to see the facts before making a decision, Dr. Marco Cardinale, Head of Sports Science and Research at the British Olympic Association points to research conducted at the University of Cardiff in 2008, which showed that experienced coaches were only able to accurately recollect 59% of the critical events from a game, whereas junior coaches recalled 42%[2]

This proves the HiPPO may not necessarily be much better than the LoPPO (Lowest Paid Person's Opinion), and re-enforces the need for decision making based on facts, not the instincts of someone senior.

As Dr. Cardinale articulated in a recent interview with Deloitte, *"As an athlete I was always fascinated by the fact I was coached by someone with just a whistle. They weren't assessing anything or measuring anything, there was no evidence … As a scientist and a coach, I have always been driven by the need to use evidence to understand what determines success in sports."*

The success of Team GB at the London 2012 Olympic Games will have been due to many factors, but Dr. Marco Cardinale is one of many sports scientists who seek to understand empirically what those factors are – and then act on them.

1 Big Data: The Management Revolution; Harvard Business Review; 2012.

2 Eyewitness Recollection of Sport Coaches; International Journal of Performance Analysis in Sport; 2008.

Where sport has succeeded in becoming data-driven

Within the world of sport there are many notable examples not just of the clever use of data, but of a drive towards data-driven thinking.

Formula 1™ is a sport in which analysis and informed decision making is everything. Teams ingest huge volumes of data during a race, taken via telemetry from the cars (including those of the opposition), external feeds (such as weather predictions) and historical patterns of performance, and process this to develop their race strategy in real time. Their models have become so powerful, that some Formula 1™ teams claim that by lap 3 they are able to predict the outcome of a race to a 90%+ level of accuracy. With this data at their disposal, there is no room for (or need for) hunches.

Perhaps the most famous example of this data-driven decision making came in 2008, during the last lap of the Brazilian Grand Prix. Lewis Hamilton needed to finish in the top 5 in order to win his debut title ahead of the challenge from Felipe Massa. With just a few laps to go with Massa leading and Hamilton sitting in 5th, Hamilton's instructions were to not race Sebastian Vettel who was directly behind (effectively suggesting Hamilton let Vettel pass, and thereby be pushed into 6th position - which would lose him the title). Martin Whitmarsh, McLaren Chief Executive said they made this call, because they feared that the battle with Vettel could lead to a collision which would take Hamilton out of the race, but critically because their predictive model stated that Hamilton would nevertheless pass Timo Glock and ultimately take 5th place at some point during the last lap. They were right, it just so happened that it wasn't until the very last corner that Hamilton passed Glock and secured the title.

Whitmarsh had trusted the data, and allowed it to overrule his gut instinct. *"We told Lewis that Glock was on dry tyres and he could take Glock on that last lap...You are staring at the prediction that tells you you are going to do that [make the pass on the last lap], but you do start to wonder if you've actually got it right."[3]* Thanks to Whitmarsh's bold data-driven decision making, Hamilton became the youngest ever Formula 1™ champion (a record subsequently taken from him by Sebastian Vettel).
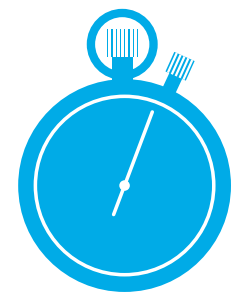
Whilst a sport like Formula 1™ , populated by highly qualified and competitive engineers, might seem fertile ground for data-driven decision making, the world of football might seem a less obvious arena in which such behaviour might be observed. Not so.

Sam Allardyce, manager of West Ham, and a man who has consistently squeezed the best out of his teams (most notably by taking Bolton into Europe), has been a leading exponent of sports science for many years. In a recent presentation to Deloitte, he revealed how he uses data to assess and inform his decisions about player performance, and their role within the team.

Amidst tales of GPS monitoring and zonal analysis, he also cited an example of when a midfield player had knocked on his door to understand why he had been dropped. Allardyce recalled how he had told the player they had effectively dropped themselves – by virtue of a declining pass completion rate. Dropping from 82% to 75% meant a spell on the subs bench. Data-driven decision making at its most effective.

So if data-driven decision making is the key to success, how can organisations overcome the cultural and technical barriers to get there? The following principles show how many sports have managed to put data at the heart of everything they do, and make analysis and evidence the basis for their strategic and tactical decisions.

18

Number of seconds that Lewis Hamilton gained on Timo Glock in order to overtake him during the final lap of the Brazilian Grand Prix in 2008, and ultimately win the world Formula 1™ title.

1	Have a vision, and a plan for how to get there
2	Build a model for what you are trying to measure and improve
3	Integrate data so you can see the whole picture
4	Ensure good data quality
5	Put data into the hands of end users
6	Have a broad funnel of ideas
7	Use data driven thinking to challenge received wisdom

3 Source: Lewis Hamilton's McLaren team admit Timo Glock was always primary target; The Telegraph online; 2008.

Have a vision – but you need a plan for how to get there

A critical foundation for achieving almost anything is a clear vision and plan. "Where are we going", and "how are we going to get there?" are questions that not only need to be asked at the start of a long car journey, but form the basis of any organisational transformation.

There are two great examples of the power of a vision and data-driven plan from the world of cricket and cycling: sports which have both been on transformational journeys over the last couple of decades.

When Andrew Strauss took over as England **cricket** captain, the team was not in the best of health. From the high of defeating Australia in 2005 to recapture The Ashes, in what many consider to be 'The Best Test Series of All Time', the team had slowly fallen back down the test rankings and were languishing just above Bangladesh.

Strauss came into the role, and the target was clear – to be the number 1 test team. Deciding on such an inspiring vision had nothing to do with cool-headed analysis, but in devising the plan to achieve the vision, the England management team were clinical and meticulous, and data played a key role.

Hugh Morris, the ECB Deputy Chief Executive and Strauss together analysed the teams they would need to play and the results they would need to achieve in order to rise up the rankings. They identified the players who had the right skills to defeat those opponents in different conditions. They identified the strengths and weaknesses of the opposition through rigorous analysis of their scoring patterns, how they had lost their wickets, when they were vulnerable during an innings, where they had conceded runs. They made sure that they had a very clear plan for each game, for each day, for each session, for each player – which was founded on hard evidence, compiled from years of data.

Strauss, in a recent presentation to Deloitte, talked about how critical data analysis became as it meant there was *"no hiding place"* for the team. It presented unambiguous evidence about the changes that players needed to make in order to raise their game to a level where they could achieve the vision and goals that had been set. When England reached number one by defeating India in August 2011, the data-driven plan had come to fruition.

England Cricket – Rise to number one

2010

#5 Strauss first took over test captaincy on permanent basis

August: England then beat Australia in the second Test at Lord's for the first time since 1934

2009

#5 **January**: England settle for a 1-1 drawn series in South Africa

August: England beat Pakistan

2011

#3 **January**: England win an Ashes series in Australia for the first time in 24 years with a crushing 3-1 success.

#3 **June**: England move a step closer to becoming the top-ranked Test nation following a 1-0 rain-affected series against Sri Lanka

#1 **August**: England confirmed their place at the top of the Test rankings for the first time with victory over India in the third Test and a 3-0 lead in the series.

2009 2010 2011

England Test Rankings

(progression through test ranks from when Strauss took over to when England achieved number 1)

British cycling Olympic Games medal count

	Gold	Silver	Bronze	Total
Seoul 1988	0	0	0	0
Barcelona 1992	1	0	0	1
Atlanta 1996	0	0	2	2
Sydney 2000	1	1	2	4
Athens 2004	2	1	1	4
Beijing 2008	8	4	2	14
London 2012	8	2	2	12

Cycling has probably been the pre-eminent British sporting success story over the last two decades. Since Chris Boardman captured the public imagination by winning his gold medal in Barcelona 1992 with his futuristic bike, Britain's pedal-powered fortunes have enjoyed an inexorable rise.

Peter King CBE, CEO of British Cycling from 1997 to 2008, is also someone for whom a lofty vision was incredibly important:

"In 1998, at a management team away day, we concluded that we must set high targets for our reborn organisation [British Cycling] if we were to be truly motivated. We decided that we wanted to be ranked number one in the world in the Olympic cycling disciplines and to have 100,000 members by 2012. The board's reaction was to say that we would never do it and that they could not endorse such a plan. At the time we were ranked 17th and only had 13,000 members so I was asked to aim only for the top five and for no more than 50,000 members. No, I said, my new team wants to shoot for the stars. Reluctantly the board agreed – and the dream was born".[4]

Another vision which came from the heart – but one which was quickly coupled by rigorous analysis and data-driven decisions:

Speaking recently to Deloitte *"The first piece of analysis we did was to analyse the number of medals available in different disciplines and our chances of success in those. In seeking to achieve our goal, we chose not to chase all disciplines – but instead focus on those in which we had the greatest chance of winning – based on the strength of the competition and our own ability to reach the targets we believed would deliver a gold medal. We used data and analysis to pick our battles."*

This identification of the specific medal targets was just the start of perhaps the most compelling data-driven success story in all of sport. From the angle of the teeth in the cogs to heated shorts, innovations in cycling have been driven by a relentless focus on analysis, measurement, iteration and re-measurement.

It may seem obvious to state the need for a plan, but there are many organisations which have spent many millions of pounds on analytical platforms or software, without any real understanding of why they were doing so. Having a purpose and a clear plan for analysis will go a long way to ensuring that real value is derived from investments in data technologies.

4 Revealed: How the UK cycling team won their Olympic golds; Golf Club Management.net; 2012.

Build a model for what you are trying to measure and improve

173

Between 10 January 2000 and 6 February 2004, India's Rahul Dravid went 173 innings without being dismissed for a duck (all formats), the longest such run in the sport.

If the formulation of a data-driven plan to achieve the vision provides a foundation, the development of a model which explains – in data – what you are trying to achieve is the next critical step.

The world of rugby underwent a major transition at the turn of the millennium, as the shift in culture following the professionalisation of the game in the mid-90s started to take root.

Phil de-Glanville, former England rugby captain and a player who straddled both the amateur and professional era, talked Deloitte through some of the changes that started to occur as the drive to enhance performance created a desire to deconstruct measure and improve. Speaking of his time with England:

"Sir Clive Woodward broke the game down into components, very specific parts. It wasn't just forwards and backs, he also looked at defence, kicking, and ultimately developed a view of how each individual player should contribute. He wanted to make everything measurable and work out how to improve even the smallest component. Defending particularly improved massively as a result."

This deconstruction of the thing which you are trying to improve is the start. As mentioned above, the next step is to actually represent the relationship between all the components in data - so that each component can be tweaked, and the impact tested against a baseline. For true data-driven thinking, this is a must-do.

Michael Bourne, who is now Head of Science and Medicine for the England and Wales Cricket Board (ECB), having previously held the role of National Lead for Performance Analysis at the ECB, explains how he tackles this challenge:

"I build a model of the sport to find the factors which explain the outcome. In the first instance this would be theoretical modelling of the first principles of the sport. You use a hierarchical model where you take a discipline and you define mathematically what it takes to, for example, throw a javelin 90 metres, or run a 100m in less than 10 seconds. You use this model to work out where your interventions are necessary [i.e. where you will try to make a change] and what data you need to collect to explain that particular part of the model."

In a business context this might involve modelling the relationship between different departments, as a simple example: if the sales team increase their efforts, what impact does that have on the inbound call centre? It is impossible to make an informed decision about a change to strategy in one division, if you do not understand its impact on another.

"In a hierarchical model you know the inter-relationships of all of the factors. In long jump for example, you would know the direct impact on distance jumped if you increased your run- up speed by 2 metres per second, and you would also seek to understand what positive or negative effects increasing run up by this speed may have on other factors. In more linear sports like rowing or cycling you can do this mathematically. In more complex sports like football or rugby you work on more logical principles which you can confirm using statistics."

It is with this model, and the underlying data supporting it, that you can begin to chip away at the cultural barriers to data-driven thinking, and start to break down a reliance on the HiPPO:

Michael Bourne: "When I used to work in Olympic sports there was a belief that Judo champions needed a minimum of 4 techniques in 4 directions, but when you go back and analyse previous champions, they often only had 1-2 techniques in 1-2 directions. They were so efficient that that was all they needed, contrary to the opinions of many."

But Bourne points out that there is not necessarily a one-size-fits-all model for a given sport, it is important to understand the specific metrics which pertain to your team's situation.

"You can't take a non-representative dataset and try to extrapolate that out into the wider population. One example in cricket would be looking at how Australia played when they dominated world cricket. Their process and methods may not be the best way to do things for England cricket, as many things are specific to Australian cricket [for example weather and pitch conditions] and aren't representative of the English game."

Many businesses do not truly understand the interrelationships between the various component parts of their operations, and consequently when seeking to make changes they often make decisions based on their instincts or anecdotal evidence, or experience of another organisation which may not be relevant. To properly answer questions such as "why do we keep sending incorrect bills to our customers?" or "how can I reduce inbound calls to my contact centre?" requires a model to be built which reflects all the factors which might impact upon that outcome. With this up-front investment, optimising operations is hugely facilitated.
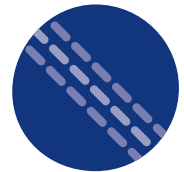
241
Cricket: In Glen McGrath's illustrious 14 year international career he claimed 241 wickets thanks to a catch from the wicket-keeper (all formats), more than any other cricketer in the history of the sport.

Integrate data, so you can see the whole picture

A significant challenge for many organisations is data integration, or put more simply, getting data into one place so that it can be analysed. There are two parts to this problem

Firstly, ensuring that analysis is being conducted with the whole picture in mind. To a certain extent this mirrors the point made above – namely that organisations need a model to explain what they are trying to understand and improve, and it is the model which dictates which data need to be integrated.

But even with a model in place, all the component parts need to come together. It is little use if, having decomposed a problem into measurable components, you do not re-integrate the findings from those components to paint the whole picture.

As Peter King explains of British Cycling: *"A while ago we adopted an approach picked up from NHS. Our equivalent of their patient-centric care is being athlete-centric in our analysis. Anyone with input to an athlete's success would regularly meet and talk through their needs and ideas. They would all put together their best view of what would be best for that particular athlete".*

Through their athlete-centric approach which integrated all analysis, cycling was able to make significant changes which would not have been spotted had divisions remained discreet. A good example of this: making sure that the cyclist and the bike are assessed as a single entity. Seemingly obvious, but it had not always been the case:

"For a long time it was considered that narrowing the bike was the best way to streamline it. We spent a lot of time in wind tunnels over the years and probably do it better than most. But before the London 2012 Olympic Games we looked completely differently at how the front forks work with the wind. We realised that if you made them much wider they would actually create an airflow over the legs and body parts of the cyclists which makes the whole more aerodynamically efficient. Designed not to be efficient in their own right, but work perfectly when combined."

As such, cycling avoided silos of analysis, which curses so many businesses – creating a focus on the end goal which brought all components together.

But Dr. Marco Cardinale points out that not all coaches or clubs have managed to overcome this challenge.

Dr. Marco Cardinale: *"[Data integration] is still a big challenge in the world of sport. Lots of people collect data in different places. In a typical football club, a sport scientist will have data generated by different data capture systems and formats and the medical team and performance analysts will be using separate systems and not integrating. The data is not in the same place and cannot be interrogated properly".*
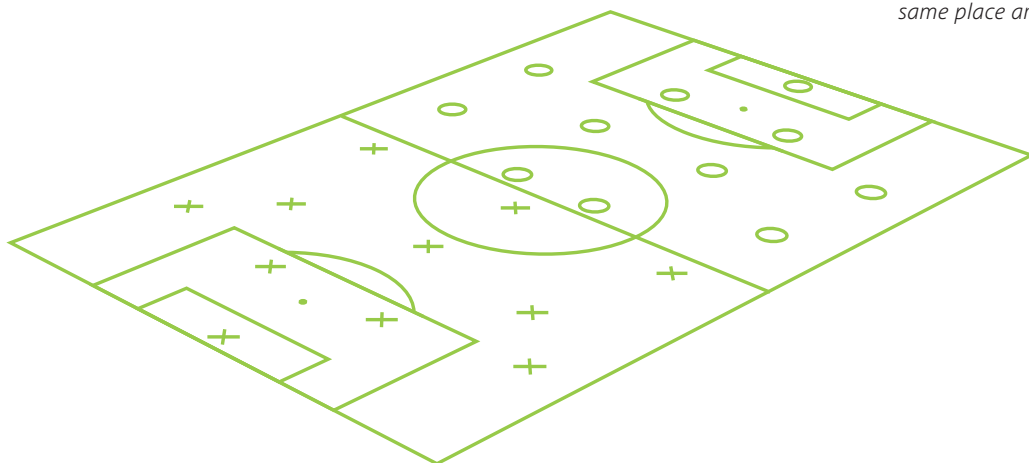
Ensure good data quality

Poor data integrity is both the cause and result of poor operational performance, and is the single biggest barrier to creating a culture of data-driven thinking. If the data are incorrect, trust is eroded, and the HiPPO grows in strength.

Sam Allardyce recounted a humorous tale which re-enforced how important it is to have the right facts and figures at your disposal, and the importance of controls in establishing a trustworthy dataset.

During pre-season training Allardyce allowed a certain player who was not living near to the club to perform some training sessions at home – saving him a lengthy commute, and (theoretically at least) increasing his wellbeing. To ensure that he was indeed training and to allow progress to be monitored, the player was provided with a GPS and heart rate monitor – to track his movement and the intensity of his efforts (a foundation for data-driven analysis).

When the player returned for training sessions at the club, his statistics didn't come close to matching the very impressive readings from his GPS and heart rate monitors. Whilst initially this was put down to a glitch, it was a pattern that continued throughout the pre-season. When Allardyce confronted the player to find out what was going on with his home-based training regime, it turned out that the player had (somewhat creatively) strapped the monitors to his dog – and sent him out for a run around the local park.

This highlights the challenge of maintaining data integrity where humans are involved. We make mistakes, we cut corners, like water we will find the path of least resistance to the outcome on which we are measured. If that means creating a new customer called Mr. Mickey Mouse (rather than searching on an antiquated database to find his real name and address) in order to get a sales commission, or indeed strapping a GPS monitor to a dog, then chances are we will do it.

Businesses need to adopt strong controls, imposing a data governance regime which creates ownership and oversight of data quality, coupled with a data architecture which doesn't enable duplicates to sprout up in un-connected data marts around the organisation.

Equally, a data dictionary is a key component in maintaining good quality data. As John Coulson of the sports data company Opta points out:

"Data definitions are a big challenge. How do we define a cross or an interception? Every coach has a slightly different view, and so can be reluctant to use data as the definitions are not exactly in line with their approach. What we have tried to do is split the database down so we have lots of descriptive qualifiers for each event type which can be turned on and off, so the data is more customisable."

Attention to detail is the key to good data integrity. Attention to detail, checking, following a system. But making sure that the data is in a form that is suitable for the end user is equally important if it is to be adopted. A data dictionary, with "key mapping" which allows different data points to be traced back to the same definition, is a critical bedrock.

16.7%

On average, football strikers score with one in every six attempts at goal.

Put data into the hands of the end users

Whilst Business Intelligence (BI) departments were originally created to be the engine room for insight, they fast became akin to a well-marshalled (retreating) infantry, ruthlessly preventing unfettered access to the precious commodity that was processing power. Many BI departments came to protect and prevent access to insight, as they had to prioritise which analysis came first – given the constraints of the hardware and software that was running queries coming from all parts of the business. They simply couldn't answer all the questions, so it became very difficult to have your questions heard. As a consequence, many organisations have seen BI 'skunkworks' sprouting up in dark corners – cobbled together spreadsheets and analytical tools created by people who were deemed not important enough for the BI department to listen.

What this behaviour shows is that there is a need and a thirst for insight at all levels of the business, and that people will do whatever it takes to get access to that insight.

Insight should be available to all, and with the advent of increased processing power, cloud computing platforms, visualisation tools and a more general awareness of data analysis – now is the time that organisations need to ensure that BI is part of everyone's role – not just that of the defenders of the hardware. Investing in the tools and infrastructure to allow everyone access to insight will create a data-driven culture, and unleash many new ideas.

John Coulson of Opta points out that putting data analysis into the hands of the "end user" has had a huge impact in football.

"Players, from the academy team upwards, want to see and understand their match and fitness statistics – and then compare themselves to their peers, those in the first team, and even Lionel Messi. The culture of analysis is growing in the game all the time."

Phil de-Glanville, former England rugby captain, pointed to exactly the same culture in rugby. "It is another way in which highly competitive people can be competitive with one another, and allows players to benchmark themselves against other people in their position. Opening up the data serves to drive everyone harder."

Whilst most businesses won't necessarily want their employees to use analysis as a means for outright competition – these examples re-enforce the idea that opening up insight to everyone across the organisation can drive you towards your objectives.

Have a broad funnel of ideas

An inevitable consequence of opening up access to insight for all will be the generation of many more ideas. With greater understanding of the facts and strong evidence will come a greater resolve to take action that drives change. For some, this could be seen as a managerial nightmare, an opening of a Pandora's box of feisty bee-in-the-bonnet employees looking to do something different.

But this wasn't the case for Peter King when he was running British Cycling. For him, a broad funnel of ideas was the starting point for finding that extra 1% which could be the difference in winning another gold medal.

"We've tried all sorts of random and bizarre ideas because we are not sure what's going to happen until you've analysed it properly. It's a continuous process, we probably shelve as many ideas as we actually use, and sometimes you have no guarantee that what you are doing is making a difference."

This tells us something about the management style that is required to foster this success: trusting, supportive, and open to ideas from others. Evidence has a way of making this trust easier to give (where the facts are indisputable), but the leap of faith that some organisations might be required to take should not be underestimated.

And it is a leap of faith that will no doubt have its detractors:

Peter King: *"Our secret squirrel department, the team that now sits under the Director of Marginal Gains, had the job of coming up with lots of potential ways to improve and testing them. I think at the start of this approach, a huge number of people thought we didn't know what we were doing and the old ways would eventually prove to be the best way. We stuck with it, we evolved a plan for Sydney 2000 and because we started to see success, people started to accept the approach."*

Peter King also points to the culture of constantly striving for success that underpinned this empowerment and desire to investigate lots of seemingly bizarre ideas. In many ways, he is saying that a business can't afford not to investigate a broad funnel of ideas:

"What happens in business is people do not spend enough time asking why they do things a certain way. However successful we might be, we never stopped looking for the next opportunity to improve. The reason we could repeat our 2008 Bejing Olympic success in London 2012 was because we didn't stand still. We knew people would catch up with us so we had to move on. We had to analyse everything we did in Beijing and work out how it could be improved".

British Olympic Games medal count

19	13	15	29	17	19
Gold	Silver	Bronze	Gold	Silver	Bronze

Beijing 2008 · London 2012

(Overall medal count)

Using data-driven thinking to challenge received wisdom will bring rewards

77%

The number of penalties that have been converted in the last decade of Premier League football.

Being truly data-driven will inevitably mean challenging received wisdom. And it has been this cycle of analysis, evidence, challenge and change which has fuelled much of the success of British Cycling for the last two decades.

This starts at a structural/ high level for training plans

Peter King: *"It used to be the case that training for cycling involved going out cycling for a long time. It was believed that the more cycling you did, the better a cyclist you would become. We have now realised that this isn't the case – through analysis we can understand the building blocks of what it takes to become faster, fitter – and we create a training regime which satisfies that model. Cyclists will now spend as much time, if not more time, off the bike, in the gym – doing very specific exercises to meet very specific targets."*

… then becomes more specific

Peter King: *"In Beijing when we did the team sprint, accepted thinking was that the three riders had to stay as close to each other as possible. During training, we suddenly realised that Hoy was two to three feet behind the number two rider. Everybody thought we had got it really wrong but the analysis had showed that in his particular case he could go faster by dropping back a touch before accelerating past".*

… and yet more specific still:

Peter King: *"For a long time helmets were made longer as this seemed the best way to make them as streamlined as possible. Only with the benefit of detailed analysis of different positions of the rider wearing the helmet could we see that any gains from the longer tail was lost when the rider's head moved. So they now have much shorter tailed helmets, lessening the negative effect.*

Whilst there is much to admire in Peter King's fostering of a culture which enabled this constant challenge and evolution, it will not be the case that all organisations are able to make such bold leaps so easily.

The temptation for those armed with a breakthrough insight is to try and smash through the way things are currently done, and drive change. But the job of the analyst or data scientist is not that of an iconoclast, or organisational steeplejack – those presenting analysis are there to support those who need to make decisions, not break them into submission.

As Dr. Marco Cardinale points out: *"The attitude of sports scientists should always be to support the coach. It's not our job to find out whether the coach is right or wrong, our job is to help the coach do better for the athlete".*

It is also the case that those bringing new ideas need to think very carefully about how to present their analysis. History is littered with the shredded pages of presentations made by those who had great ideas, but couldn't communicate them effectively.
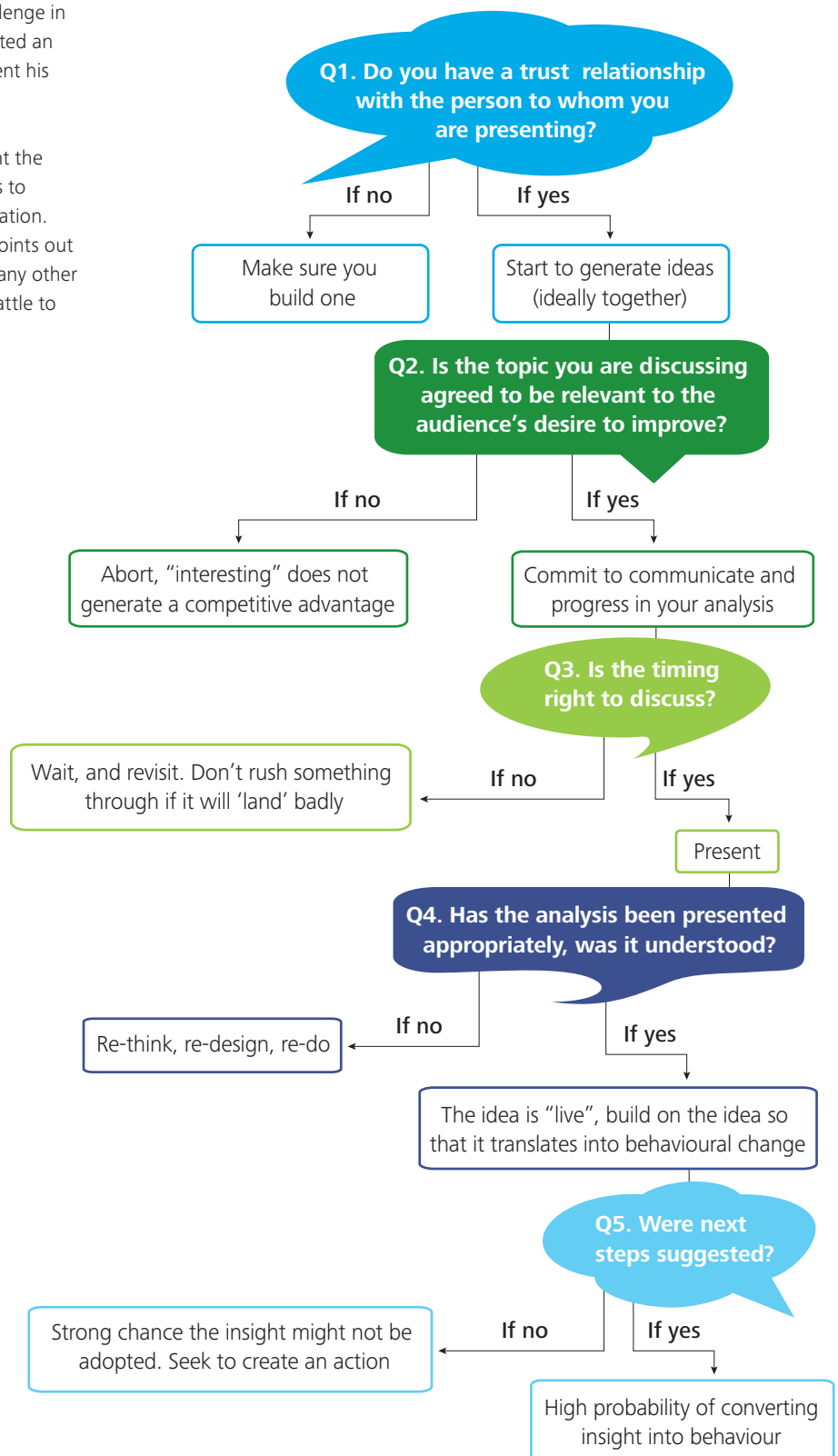
Marco Cardinale: *"I find it very important to present data in a meaningful way to the coach. Many don't want to see graphs or stats, they just want to know very basic information and athletes are the same. Turning analysis into relevant information which can be easily understood and trigger the implementation of solutions requires effort – but this is critical".*

Football analysts have become experts in boiling their findings down to something digestible. They quickly realised that data presented to players without insight or context would fall on deaf ears, or quite possibly ears covered up with the latest designer headphones.

John Coulson of Opta: *"A lot of clubs started out by just putting stats up in the dressing room but with no analytics layer on top of it, so there was no context to this data. Players could see who had run the furthest in the last game, but had no view of whether this was good or bad. Now we are getting to the point where we can say that with the passes a player made in a certain area of the pitch, they increased the probability of the team scoring by a specific percentage".*

Michael Bourne of the ECB has faced this challenge in many different sporting scenarios, so has created an approach which guides how he seeks to present his analysis to coaches or athletes.

So, no matter how insightful, robust or brilliant the analysis that has been conducted, it still needs to recognise some immutable laws of communication. Even in a sport like cricket, which as Bourne points out already has an "affinity" with numbers (not many other sports have an official role for a scorer), the battle to win over the coaches is not always easy.

Q1. Do you have a trust relationship with the person to whom you are presenting?

If no → Make sure you build one

If yes → Start to generate ideas (ideally together)

Q2. Is the topic you are discussing agreed to be relevant to the audience's desire to improve?

If no → Abort, "interesting" does not generate a competitive advantage

If yes → Commit to communicate and progress in your analysis

Q3. Is the timing right to discuss?

If no → Wait, and revisit. Don't rush something through if it will 'land' badly

If yes → Present

Q4. Has the analysis been presented appropriately, was it understood?

If no → Re-think, re-design, re-do

If yes → The idea is "live", build on the idea so that it translates into behavioural change

Q5. Were next steps suggested?

If no → Strong chance the insight might not be adopted. Seek to create an action

If yes → High probability of converting insight into behaviour

Conclusions

99.94

Cricket:
Sir Donald Bradman recorded a batting average of 99.94 in Test matches, had he scored just four runs in his final Test against England he would have maintained an average of 100.

In elite sport, with competition so intense, and the margins separating success and failure so narrow, analytics has become a critical component in the armoury of the coach. To know the exact moment to change tyres in Formula 1™ , the ideal muscle temperature for optimal performance, the perfect width of the front forks to create an airflow around the cyclist, the optimal team shape for a given footballing opponent or the defensive weaknesses of an opposing batsman – data needs to be efficiently gathered, analysed and presented in a manner which makes it easy to absorb and take action.

All businesses could learn from the use of data in sport. As we have seen, there are real and practical examples of how organisations can start to increase the importance of analysis in their day-to-day operations, and ultimately move towards a world in which decisions are made on facts, not judgement.

For more information please contact:

Peter King CBE

Peter King was Chief Executive of British Cycling from February 1997 until December 2008, overseeing a period during which the organisation moved from the brink of insolvency, to being one of the most vibrant and successful governing bodies of sport in the UK. Peter was made a CBE in 2008 in recognition of his services to cycling, having previously been awarded one of the sport's highest accolades, the Bidlake Trophy, in 2007. Peter is now an Executive Director of British Cycling, and Chair of the Board for England Athletics.

Dr. Marco Cardinale

Dr. Marco Cardinale is the Head of Sports Science and Research of the British Olympic Association, leads the Science and Research Unit of the British Olympic Medical Institute and led the Sports Science activities for the preparation of Team GB at the Beijing 2008, Vancouver 2010 and London 2012 Olympic Games.

A former Handball coach, Dr. Cardinale has expertise in strength conditioning and exercise physiology. A widely published and cited author in the scientific literature on various aspects of human performance, he has also patented an exercise device which received research awards from NEStech and the Design Council.

In 2011 he was awarded the honour of "Cavaliere dello sport pontino" by the Italian Olympic Committee for his services to international sports.

Dr Cardinale holds a B.Sc. from ISEF in Italy, an M.Sc. from the US Sports Academy in the USA and a PhD from Semmelweis University in Hungary.

Michael Bourne

Michael Bourne has recently been appointed the Head of Science and Medicine for the England and Wales Cricket Board having filled the role of Performance Analysis National Lead for over 3 years in the same organisation. Prior to this he spent five and a half years with the English Institute of Sport as a multi-sports analyst including leading the analysis programmes for Judo, Boxing and Diving. Michael also started the EIS skill acquisition consultancy service which is still in operation today. His first role as a practical sports scientist was with Great Britain Shooting as an assistant biomechanist.

Michael is a BASES accredited interdisciplinary support scientist with an undergraduate degree in sports science and coaching, a biomechanics MSc and a PhD in visual perception. He is also a published scientific author and regularly delivers coach education programmes for various UK sports governing bodies.

* All stats sourced from Opta, 2013.

Notes