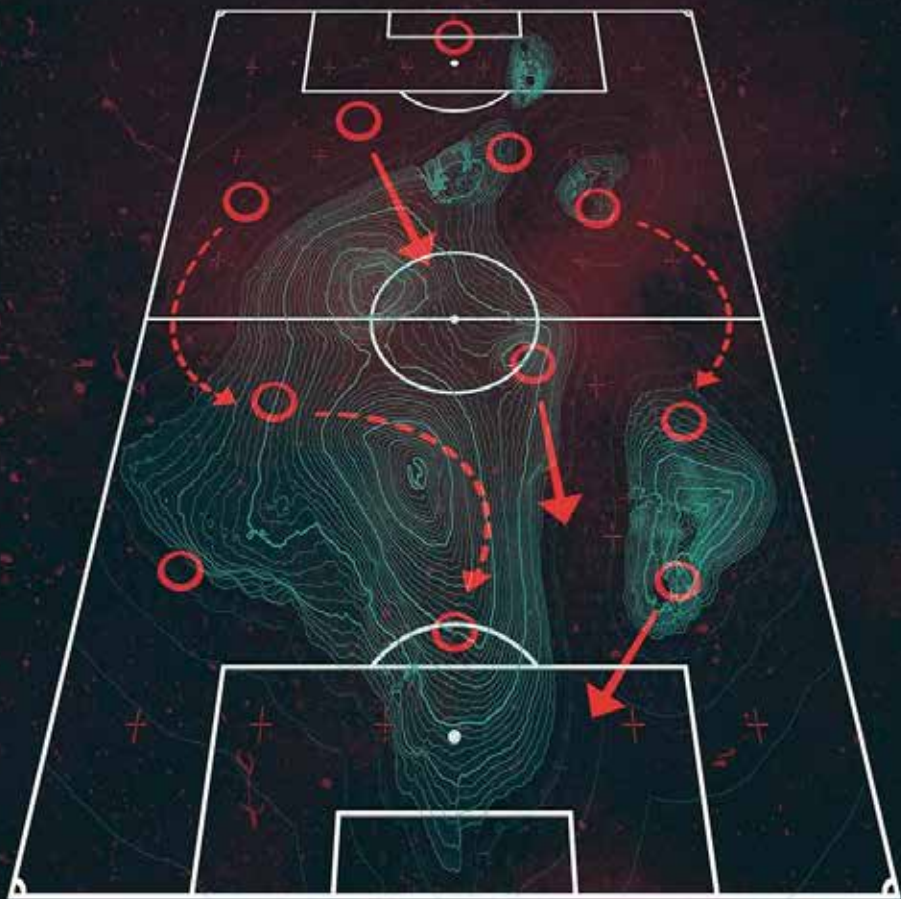


# DATA GAME

The Story of Liverpool FC's

**ANALYTICS REVOLUTION**



**JOSH WILLIAMS**

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# Contents

Author's Note . . . . .	7
1. Learning How to Count. . . . .	13
2. The Big Bang . . . . .	25
3. Cowboys . . . . .	43
4. 1,102 Ways to Get Worse . . . . .	55
5. The Art of Dying . . . . .	71
6. The Goldilocks Zone . . . . .	93
7. Jürgen . . . . .	105
8. Einstein . . . . .	116
9. Truth Serum . . . . .	129
10. Transformers. . . . .	144
11. Pitch Control. . . . .	158
12. Playing Chess with Loaded Dice . . . . .	171
13. A Different Type of Arms Race . . . . .	185
14. The Rise of the Machines . . . . .	202
15. Liverpool 2.0 . . . . .	218
Works Cited. . . . .	230

## Chapter One

# Learning How to Count

YOU'LL FIND a wide variety of different people in Las Vegas, Nevada. The first-timers, the newly-weds, the selfie-obsessed tourists, the high-rollers, the alcoholics, the locals who have seen it all, and the professional gamblers. John Henry assumed the form of the latter in 1971, or at least that was his intention. The subdued and reserved American, who had only been legally allowed to gamble for a little over 12 months, had parked himself at a blackjack table in one of the city's many casinos in an attempt to win big by minimising the element of chance through the application of mathematics. For most of the players surrounding him, winning was determined by little more than fate, hope and good fortune. It's in the lap of the gods, many amateur punters would suggest. Betting was about chance, destiny and randomness for the man on the street. For Henry, winning was determined by more than that, it was about probability. It was about gaining even the smallest upper hand.

He had developed a natural feel for numbers throughout his childhood years. Henry was a maths whizz

in school, and as he was growing up, he was learning about how to use his numerical skills to navigate the practical realities of life. He wasn't in Vegas for a good time, attending shows and visiting tourist attractions wasn't on his to-do list. The trip was all business, albeit before he'd truly entered that world. Henry was attempting to acquire a marginal edge through the strategy of card counting. In simple terms, keeping track of what cards have been dealt, and using that information to evaluate whether the dealer has an advantage or not. He would later produce a paper on the concept alongside one of his instructors at the University of California, but before he was able to beat the odds and strike it rich, a voice politely asked him to leave the premises. While card counting without any outside aid isn't technically illegal in Vegas, casinos do tend to reserve the right to tactfully remove those who are suspected of counting. 'I can count multiple decks,' Henry said. 'It's not hard.'

A farmer from a young age, Henry was destined for a different path to his ancestors. He inherited his family's 1,000-acre soybean farm after his father's death – which happened a few years after his trip to Vegas – but rather than continuing past traditions by planting, growing and harvesting corn, cotton and rice, Henry broke the mould by predicting the futures of his products. 'Most farmers want to talk about their tractors,' said a local friend who managed his own nearby farm, 'but all John wanted to talk about was the market and prices.' The man who would later own Liverpool Football Club as the face of a multinational consortium made his fortune as a commodities trader before exploring sports. 'If you follow your bliss, you put

yourself on a kind of track that has been there all the while, waiting for you,' he said in an interview with ESPN. 'That's what led me into the financial world, because I enjoyed applying mathematics to markets, and it was a profound challenge that resonated within me.'

Trading could be quite intimidating for newcomers, even the smartest and most prepared operators. The stock exchange was prone to descending into utter chaos as floor traders fought to get ahead, and that anarchy epitomised the nature of the market. Bright colours and numbers indicating price changes would battle for the spotlight in every direction, with people yelling, shouting and waving papers, almost as though they were trying to place a last-minute bet on a horse race. Beginners usually followed one of two paths upon testing the turbulent waters of the investment world. Some would react with horror before searching for the nearest exit door, whereas others reacted with intrigue, appreciating the lack of sense in front of them before wanting to delve deeper in search of logic. Henry sided with the latter, recognising the many inefficiencies attached to his early experiences toying with stocks and shares. He has been described as having a 'laser-like focus' by Mark Rzepczynski, who was president of Henry's investment firm for nine years between 1998 and 2007. That was outlined as his big secret to success. 'If he was looking at a table or chart of numbers, he could look at pages and pages and find the one wrong number,' said Rzepczynski.

A college dropout, Henry's trade investments were guided by data, which was an approach designed to remove bias, ego and emotion from the decision-making process.

He was entirely dispassionate as an investor, and created his own sophisticated algorithm at the start of his journey by gathering historical price data from public libraries and using a hand calculator to challenge the accuracy of his models. Technological limitations curbed the wisdom of his work, but his methods were still far more progressive than most of his fellow investors. It was a pioneering approach at the time that integrated a degree of intellect and process into an otherwise hectic and almost senseless exercise. Back then, the average trader was ruled by gut feelings. It was a lottery, it was glorified gambling. In truth, there wasn't much of a difference between the floor of the casino and the market, with pipe dreams influencing monetary decisions. Henry was stepping ahead of the curve by applying numbers, and in 1981 he established his own investment firm, which Rzepczynski would later preside over, John W. Henry & Company.

That year, 5,000 miles away, Liverpool lifted their third European Cup – now known as the Champions League – in Paris under the leadership of Bob Paisley, who was experiencing his seventh successive campaign in charge of the Reds. Football was different in those days. Much like the world of business that Henry was enduring at the time, decisions on and off the pitch were shaped by rudimentary feelings and pure instinct. The tactical elements of the game were largely overlooked, with players instructed to go and win what was essentially a battle of will rather than a complex sport that would later embrace strategy. 'Work it out for yourself, son,' was a term used on a regular basis before matches, according to Graeme Souness, who once testified to asking for instructions just

minutes before his first-team debut at Liverpool, only to be shamed by Paisley's assistant, Joe Fagan. 'We've paid all this money for you, and you're asking me how to play football,' he said.

Souness, who captained the team for a two-year spell in the 80s, has since elaborated on how Liverpool rarely held team meetings or talked about their opponents during his time as a player at the club. A matter of hours before the European Cup Final in 1984, Fagan, who had succeeded Paisley to become manager, addressed his players after eating lunch at their hotel in Rome. The Walton-born Scouser rattled his glass with a spoon to gather the attention of those surrounding him in an uncharacteristic move. Silence consumed the room, before he stood up to give an unexpected but brief speech. 'Big game tonight, boys,' he said in a nonchalant tone, unruffled by the event. 'They must be a good team, but they can't be as good as us. They can't be as good as us. The bus leaves at 5.30pm, don't be late.' Preparation was simple and borderline prehistoric, but it was normal. Nobody expected much more. Liverpool won the final by four goals to two on penalties; football was straightforward.

There was a vague tactical identity at Anfield at the time, and it was considered as far more advanced than most of Liverpool's domestic rivals. The team upheld a possession-based playing style that had been shaped by their exploits in Europe. Liverpool's tie in the second round of the European Cup against Red Star Belgrade in 1973 was a particular catalyst for change upon reflection of the club's history, having had a dramatic impact on their approach after Bill Shankly's men lost both legs



by a combined score of four goals to two. The central defenders of Red Star caught the attention of Paisley, who was Shankly's assistant at the time. They behaved like midfielders when in possession of the ball, demonstrating a capacity to pass through the thirds of the pitch without panicking or making unforced errors. Rather than hitting long to a physical striker and attempting to penetrate the penalty box with every single touch in a perfectly English fashion, the Red Star defenders remained composed and progressed through Liverpool using passing triangles.

It was different from the football witnessed back home. Aggressive and rugged defenders were fielded on English shores. It was all about dying before ever conceding a goal; what you did in possession didn't matter so much. After witnessing the future against the champions of Yugoslavia, Liverpool experimented in an attempt to copy Red Star by deploying midfielder Phil Thompson in the centre of defence alongside Emlyn Hughes, who had experience as a full-back and as a midfielder, rather than Tommy Smith and Larry Lloyd, who featured in both legs and seemed to suit a more direct style of play. 'The Europeans showed that building from the back is the only way to play. When they play the ball from the back, they play in little groups,' Shankly later recalled. 'We realised at Liverpool that you can't score a goal every time you get the ball. And we learned this from Europe, from the Latin people. It started in Europe and we adapted it into our game.' Liverpool gained an edge over their domestic rivals on the back of their contests on the continent, but tactical concepts back then were still largely undeveloped in comparison to modern times. The pitch was more of a war zone than a chess board.

If the tactical landscape of football was to be described as undeveloped back then, statistical conditions could be deemed as almost embryonic. Data relating to the performances of players and teams was simply not recorded by those competing in the sport, largely because the required technology hadn't yet been invented. In the eyes of many people within the game, nothing mattered beyond the numbers that formed the league table, consisting of columns such as wins, draws, losses, goals scored and goals conceded. Goal difference, an ordinary calculation of goals scored minus goals conceded, is now mainstream and widely considered as commonplace, but it wasn't introduced as a tiebreaker in association football until the 1970s. Before that, goal average was the go-to formula, a broken metric that epitomised the lack of expertise surrounding the use of numbers in football at the time. Goal average consisted of the number of goals scored divided by the number conceded, which naturally favoured conservative playing styles rather than encouraging offensive football and entertainment, and it was eventually scrapped.

Data didn't exist beyond manual collection, which was first reportedly conducted by Charles Reep in 1950. Reep was mathematically inclined and suited his role serving as an accountant for the Royal Air Force. Located in London due to his services, Reep occasionally attended Arsenal and Tottenham Hotspur matches up until a clash between Swindon Town and Bristol Rovers forced him to begin analysing the inner workings of the game. At half-time, he was bemused by the brand of football that he was witnessing, is how the famous tale goes, with the home

team adopting a lethargic and ineffective approach when in possession of the ball. It was all sideways, there was no practicality. He had been consumed by boredom, so for the next 45 minutes Reep used a notepad to record a portion of basic events on the pitch, particularly those associated with passing sequences and how attacking plays ended, of which there were 147 according to his count.

He began dedicating his time towards recording data, watching roughly 40 matches per season and spending 80 hours per match noting down his figures. The standard of technological advancement at the time was captured by Reep having to wear a miner's helmet to make notes during night matches, using the light on his head to illuminate his pad. He couldn't use an iPhone, laptop or tablet, this was the Stone Age. Once delving into the data that he had collected over time, Reep began exploring analytics before it was a thing, attempting to interpret patterns in his numbers and using those to deliver strategic insights. His analysis concluded that lengthy sequences of possession failed to add much value and that, instead, moves that consisted of three passes or fewer delivered the most goals. His claim, in essence, was that long-ball football was more effective, as he told the BBC in 1993. 'If a team tries to play football and keeps it down to no more than three passes, it will have a much higher chance of winning matches,' he said. 'Passing for the sake of passing can be disastrous.'

While Reep might have had a point with the closing line of his statement, his analysis was primarily flawed. He identified that a larger proportion of goals happened on the back of short sequences, but without considering whether such a finding had a direct association with

the actual probability of scoring. Football, particularly during Reep's era, was akin to basketball in the sense that turnovers happened frequently and possession bounced from one end of the pitch to the other every few seconds. It was chaos. He was keen to challenge the worth of lengthy sequences but, ultimately, those sequences didn't happen that often anyway.

Reep's analysis was not wholly objective, and his findings seemed to be shaped by an underlying innate belief that related back to his boredom when watching Swindon Town against Bristol Rovers. Nevertheless, his efforts did prove to be enough to gain him paid work in football. He operated as a consultant for Stan Cullis, manager of Wolverhampton Wanderers, for three and a half years before retiring from the Royal Air Force and assuming a role as an analyst for Sheffield Wednesday. He helped over 20 clubs during his career as the first of his kind, encouraging each of them to adopt a direct and vertical playing style that discouraged square passes and ball retention.

In many ways, his emergence as Britain's first football analyst shaped how the game would evolve in England for years to come, as his work was picked up further down the line by a man named Charles Hughes, who would later end up becoming director of coaching for the English Football Association. Although he denied being inspired by Reep, Hughes held a similar perspective on the game, stating that 85 per cent of goals were scored from moves of five passes or fewer in his book, *The Winning Formula*.

The evidence-based beliefs held by Reep influenced styles up and down the country as players were instructed

to almost bypass the centre of the field in favour of lofted passes towards the penalty area. The two penalty boxes at both ends of the pitch mattered most; everything else was just noise as Reep searched for a signal in his data. 'Passing has become such a fetish that one sometimes has the impression that goal-scoring has become the secondary objective,' he said, with regular condemnation aimed in the direction of what he labelled as 'continental' and 'cultured' styles of football, which is what Liverpool had steadily begun to adopt on the back of their consecutive defeats to Red Star on Europe's biggest stage.

Reep was ahead of his time. A trailblazer for football analytics 50 years before data was treated as scarcely useful by those competing at the pinnacle of the sport. He believed in a specific style of play and – unlike a whole host of coaches to influence football over the decades – he was committed to proving that his was the most practical and effective by supporting his case with substantial evidence rather than ego and plain opinion. He might have argued that numbers cannot lie, but while that's technically true, the figures are open to the interpretation of the user and how that user translates them. The quality of the data matters, as does the sample size. Data continues to be shunned by sections of people surrounding football in the present day, and that lack of trust tends to stem from how numbers can be easily manipulated. They can support virtually any argument. Incorrect and damaging conclusions can be drawn by those who are uninitiated or negligent, with Reep and Hughes partially responsible for impeding the early development of English football in comparison to the likes of Italy, Germany, Spain and the

Netherlands, who prospered on the international stage more often. 'Football is a simple game, complicated by idiots,' Shankly once said, but Reep would likely have suggested otherwise.

As an inquisitive St Louis Cardinals fan who grew up calculating baseball percentages while listening to radio commentary, John Henry was bound to recognise and exploit the endless opportunities in the world of sport at some stage. He saw nothing but inefficiencies, waiting to be attacked and optimised. As he was conquering the business world, he tested the water on numerous occasions, including his purchase of a one per cent stake in the New York Yankees, which coincided with Kenny Dalglish's resignation from the managerial hot seat at Anfield after almost six years in charge between 1985 and 1991. Eight years later, Henry purchased the Florida Marlins from Wayne Huizenga, who had proved to be a difficult person to negotiate with after repeatedly changing the terms of the sale despite reaching a verbal agreement. 'This has been a dream I've had for a long time,' Henry said after securing the \$150m purchase, with his immediate responsibility as owner surrounding a deal for a new baseball-only stadium for the Marlins. Huizenga had encountered problems when attempting to strike a deal for a stadium, and that was part of the reason behind his decision to sell.

Henry would make strides forward at the beginning of his ownership by reaching a stadium agreement with City of Miami officials, but after experiencing a series of setbacks and struggling to finalise a deal, he sold the club three years later to acquire the Boston Red Sox as part of a newly founded group named New England Sports

Ventures, which would later become Fenway Sports Group (FSG). Tom Werner, a successful TV producer, joined forces with Henry alongside Les Otten, The New York Times Company and other investors to form the collective, with a deal pushed over the line in 2002.

It was time for Henry's sporting expedition to properly begin. He would attempt to achieve success in the world of baseball using the same methodology that had delivered rewards in business, by placing unwavering faith in the power of numbers and gaining an edge over competitors by thinking about gaining an upper hand, just like he did at the blackjack tables in Vegas. Baseball was far more familiar with data than football, with statistics forming an integral part of the sport that revolved around nothing but set-pieces from start to finish. Everything could be quantified, and collecting data was relatively easy in comparison to other more free-flowing sports that simply didn't allow for time to breathe. The absence of numbers in baseball wasn't the underlying problem in Henry's eyes. The inefficiency lay in the data that was generally deemed to be valuable, with some of the sport's most beloved metrics disguised as meaningful, when in practice they divulged very little about performance in relation to acquiring wins. A storied term would eventually be fashioned to loosely define the practices applied by Henry's ownership in Boston: 'Moneyball'.