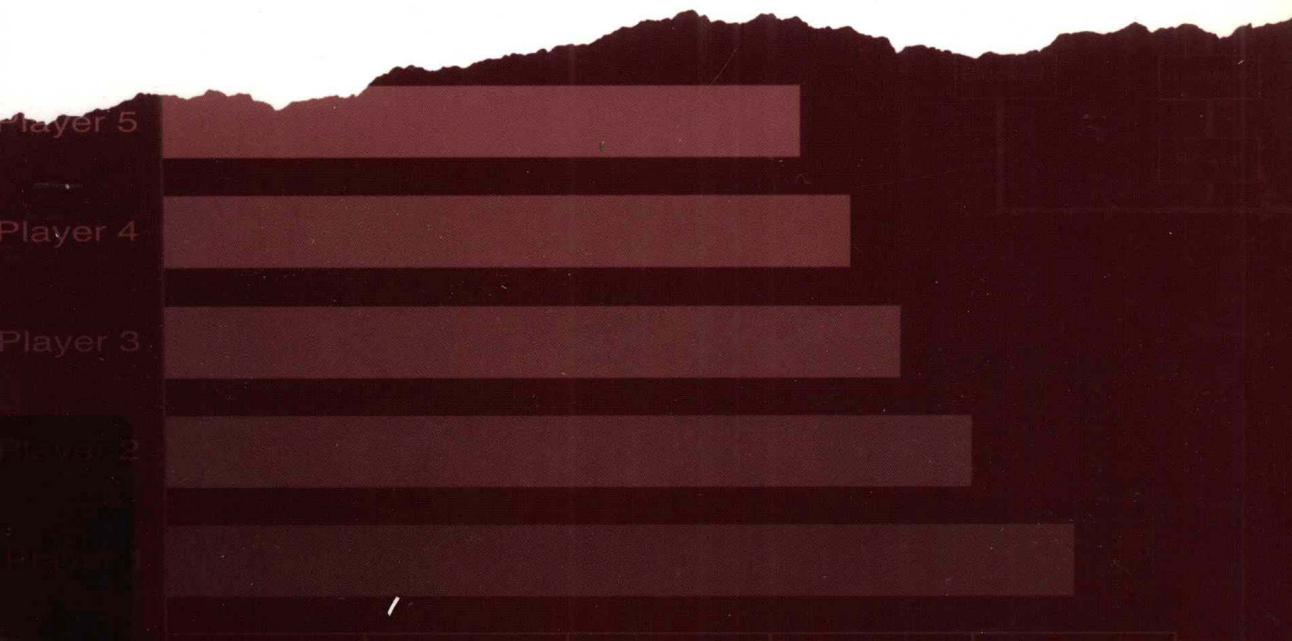
Handbook of Soccer Match Analysis

A systematic approach to improving performance

Christopher Carling,
A. Mark Williams and Thomas Reilly



HANDBOOK OF SOCCER MATCH ANALYSIS

A SYSTEMATIC APPROACH TO IMPROVING PERFORMANCE

Christopher Carling,
A. Mark Williams and Thomas Reilly

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▼ FOREWORD

The first manager I ever worked with in professional football used the *Rothman's Football Yearbook* for the information he needed about players, teams and track records. Primitive maybe, but he was a seeker of knowledge and often used the information as a catalyst for both team talks and buying players in the transfer market.

The first serious attempts to analyse the events and happenings in the game of football, to my knowledge, were conducted in the late 1940s and 1950s using a hand-notation system to compile the information. Match Analysis is now a fully accepted detection vehicle for any serious minded managerial and coaching staff but previously the science of Match Analysis had been spurned by many in football as being unnecessary and superfluous to the beautiful game. I would be extremely surprised if any Premiership Club and major international team did not now use Match Analysis in its quest for performance excellence and game results.

Staff at Liverpool John Moores University since my first contact with Tom Reilly in the 1980s and more recent involvement with Mark Williams, have always been at the forefront of research and especially research and investigation into the game of football. This book is testimony to the importance and significance of match analysis methods seen through the eyes of the authors and is for anyone seriously committed to the game of football. It provides students, sports scientists, coaches and managers with information, detail and insight into the game of football and advises all who read the book on the application of Match Analysis findings. The statement that 'coaches can only recall 50 per cent of the game events' (and I will add 'on a good day') indicates that for a comprehensive and detailed reflection on performance, a more precise and incisive method of 'knowing what happened' is essential in high level sports. Whether hand-notation, computerised video analysis or the more advanced and sophisticated Global Positioning System is utilised, a coach has a duty to himself, his players and his employer to be fully aware of the causes and facts behind performance.

From a brief history of Match Analysis to an appraisal of the differing systems, the book informs and educates us on the issues surrounding Match Analysis. The authors reveal significant technical and tactical findings with which coaches must be conversant. The physiological and athletic diagnosis of the game is also discussed and evaluated in a manner that all coaches can comprehend and imbibe.

In short, the book comprehensively and incisively advises readers on what is available, what we could analyse, how we could utilise the analysis findings, why we should analyse, what analysis can reveal and how we could devise practice, and relevant, meaningful practice at that, to benefit from our investment in the principle of Match Analysis.

It is a book that I have read with great interest both knowing the authors, for whom I have the greatest respect, and because of its sheer value in extending my knowledge and understanding of the game. Why all those interested in the game of football should read it, is crystallised in this statement in the book:

> 'successful coaches have an almost insatiable appetite for knowledge about every facet of the game'

I would advise all students of the game to invest in this book – it will make a significant contribution to their knowledge base and understanding of the mechanics of the game; it is essential reading for all coaches.

Dick Bate
FA National Coach

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▼ FOREWORD

The analysis of performance is vital in soccer if the individual/team is to be successful. For many soccer coaches the information gained from performances will not only form the basis of weekly training programmes, but also may act as the primary source for the scheduling of seasonal plans.

In order to do this, and use performance analysis successfully, it is fundamental to have a clear strategy encompassing what you wish to analyse, how you are to undertake the process and most importantly how this information can then be translated and applied to benefit performance. Such details can often prove very difficult to determine as the 'what', 'how' and 'why' are often reliant on several factors that may affect the coach's choice one way or another.

Although match analysis is not new to sport, through developments in technology and the introduction of sport science to soccer it can be used in a number of different ways and a variety of formats. As coaches it is vital that we are aware of these developments to ensure that we are able to analyse performance in a contemporary way to improve individual and team play.

The *Handbook of Soccer Match Analysis* provides coaches with such information through an extensive introduction to the many ways of implementing performance analysis in soccer. Through the provision of soccer specific examples, contemporary statistics and discussions at several levels this handbook provides invaluable support to help coaches and sport scientists apply their findings in a practical setting to optimise player performance.

An ideal companion for all serious soccer coaches wishing to develop their knowledge of the processes of match analysis at the very highest level, this book successfully bridges the gap between theory and practice.

Kevin Thelwell
Director of Youth, Preston North End Football Club
Formerly Director of Coach Education, Football Association of Wales

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INTRODUCTION TO SOCCER MATCH ANALYSIS

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INTRODUCTION

Performance in ball games is much more difficult to appraise than it is in individual sports. In track-and-field athletics the competitor who passes the winning post first, jumps highest or longest, or throws the missile furthest becomes victorious. All competitors can be judged according to their finishing position, or on the time taken or distance achieved during performance. These kinds of metrics apply also to swimming, rowing, cycling, skiing and other events. In ball games the contest is decided by points or sets won, or goals scored. In soccer there is a simple determinant of victory: winning means scoring more goals than the opposition!

When a soccer team wins a game can rightly claim that the objective has been achieved. Thoughts can be refocused on moving on to the next game and securing another victory. There is, however, a distinction between the outcome (winning or losing) and the performance by which it was achieved. Since chance often plays a role in the scoring or conceding of goals – for example, an 'own goal' or a fluke deflection – coaches recognise that what they deemed to have been the better team does not always win the game. This kind of comment raises questions about what the basis for judging performance is and whether there are any clear criteria capable of being used as evidence.

It is only relatively recently that analytical techniques have been applied to competitive performance in field games. The traditional view was that these games were essentially an opportunity to display artistry and individual skills. Watching gifted players display their skills was an aesthetic experience, analogous to appreciating artistic performance in the theatre or music hall. The audience looks for elements of creativity when the player is in possession of the ball and appreciates flamboyant use of it in the context of

performing. Those highlighted as 'flair players' get most adulation. It is not surprising that soccer has been dubbed 'the beautiful game'.

The disparate aspects of the game are evident in the historical origins of soccer. These are the emphasis on skill on the one hand and a focus on function on the other. Ball games have been traced back to ancient Chinese civilisation and the game of *tsh-chu*. The objective of the game was to propel a ball stuffed with feathers into a net suspended between two bamboo poles. This directed approach was contrasted with the more refined style adopted in Japanese culture. The activity was between two participants who attempted to keep the ball off the ground for as long as possible, using only their feet.

As soccer games spread through different civilisations, each promoting its own unique characteristics, they assumed either an entertainment or a participative function. The activity known as *calcio*, developed during the Renaissance in Italy, was an example of the former, whereas 'mob football' in Britain exemplified the latter. Entire villages participated in the mob version of the game, the object being to take the ball beyond a boundary point against the opponents' best attempts. Victory was achieved when the target point was reached. The number of marred and injured participants was irrelevant to the outcome, although individual consequences were sometimes grievous. The one thing that mattered publicly was that the game was won. It is likely that local acclaim was given to combatants at the centre of the brawling.

In the second half of the nineteenth century, the institutionalisation of soccer, first by the Football Association in England, brought order and rules of play to the chaotic versions of the game in preceding times. This formalisation was promoted by the public schools in England. Regulations were soon adopted in other European countries, and in other continents as the game developed worldwide. International matches increased in a tentative manner, as did the formalisation of the international governing body, FIFA (Fédération Internationale de Football Association), set up in 1904. The World Cup tournament first took place in 1930, meaning that the game only developed into a global competition following the First World War. A variety of styles of play became evident, which encouraged coaches to become more reflective and analytical about their own methods. The seeds of this extroversion were sown in the 1950s and 1960s, started to bloom in the 1970s and 1980s, and came to fruition in the 1990s. It is only in this past decade or so that formal match analysis has gained widespread acceptance among soccer coaches. Now, any coach who did not pursue performance analysis of some kind or other would be deemed negligent in the contemporary soccer community. Courses on match analysis are now routinely presented on coach education programmes around the world, and most professional clubs have access to match analysis in some form or other.

THE NATURE AND ORIGINS OF MATCH ANALYSIS

Match analysis refers to the objective recording and examination of behavioural events occurring during competition. It may be focused on the activity of one player, or may include the integration of actions and movements of players around the ball. Match analysis may range in sophistication from discrete data about the activity of an individual player, or of each member of the team as an individual profile, to a synthesis of the interplay between individuals in conformity to a team plan. Behaviour when defending

and when attacking can be accommodated, as can the analysis of either one or both teams together. An outcome may be a description of the team's pattern of play.

Notational analysis

Notation analysis is essentially a means of recording events so that there is an accurate and objective record of what actually took place. Spectators view matches differently, often disagree about what happened and may be completely mistaken. Each individual brings his or her bias to the game and may see it from a partisan viewpoint. Even the best coaches are often unable to recall sequences of events correctly and fail to appreciate where successful plays originated or mistakes began. Notation analysis provides a factual record which does not lie – as long as the data collection methods used are reliable and objective and the system is adapted to the level of play.

The idea of notating human behaviour is historically well established. There is evidence that hieroglyphics were employed by the ancient Egyptians to record features of movement. The strategic deposition of military units has been used in warfare on both sea and land, and mapped out as plans of attack or defence. In more recent times a shorthand for analysing movements in dance, 'Laban notation', came into use. The tactic of using coded notes for analysing competitive performances was adopted by coaches in the United States of America, particularly in basketball and American football. The utility of the approach was soon recognised in the racket sports before it was more widely applied to soccer. Current systems are much more powerful and complex than early attempts to code activity in real time using manual or even audio-tape recordings. Contemporary uses go beyond the analysis of recent matches to the prediction and modelling of forthcoming contests. Styles of play and likely patterns of movement can be simulated either as physical models or as computer-driven virtual reality scenarios.

Prior to the evolution of computer-aided techniques for recording and analysing match activities, some form of shorthand was needed to record events accurately. The need arose because activities occurred too rapidly for them to be noted manually with any degree of accuracy. One approach was to record matches on film or video tape and review the game subsequently. This was the strategy for the family of methods that became known as motion analysis. An alternative was to adopt a system of coding those activities that were characterised as relevant to an assessment of performance in the game, which would allow the events to be notated and later collated. This line of approach has been termed *notation analysis*.

Most systems of notational analysis focus on the players engaged in activity with the ball and on strategic/tactical aspects of performance. The most commonly employed systems are pen and paper based and involve a form of shorthand notation using tally marks or action codes (Table 1.1). Positional data may be recorded by breaking down a schematic pitch representation into numbered zones. The position (where?), the players involved (who?), the action concerned (what?), the time (when?) and the outcome of the activity (e.g. successful or unsuccessful, or on target or off target) are recorded. The analysis is then moved on to the next immediate point of action or contact with the ball – for example, who made the tackle, in which part of the pitch, at what moment in the game and was

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