



Technological processes and perspectives of performance analysts within global football (Soccer)

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ABSTRACT

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Performance analysis is a key component of modern football, driven by technological advancement and integration within multidisciplinary teams. However, limited research has explored how analysts implement technological processes in applied settings. This study investigated the technological workflows, analytical practices, and professional perspectives of football performance analysts. A mixed-methods cross-sectional survey was conducted with 38 analysts working in professional and semi-professional contexts. Data were collected via an online questionnaire examining workflows, responsibilities, collaboration, and perceived challenges and future developments. Quantitative data were analysed descriptively, while qualitative responses underwent reflexive thematic analysis. Video analysis was central to practice, with opposition, match, and individual analysis identified as primary responsibilities. Analysts utilised both specialised software such as Hudl Sportscode, and general tools, such as Excel and Tableau. Despite technological advances, manual video capture and notational analysis remained prevalent. Multidisciplinary collaboration was common, though not always resulting in fully integrated interdisciplinary practice. Key challenges included workload, working hours, and salary. Future developments were expected to focus on artificial intelligence, automation, and enhanced data integration. These findings highlight the coexistence of traditional and emerging practices, providing contemporary insight into analyst workflows and informing the ongoing development of performance analysis in football.

Contribution/Originality: This study provides contemporary insight into the professional practices, technological workflows, and collaborative processes of football performance analysts across professional and semi-professional environments. The research offers an original contribution by integrating technological, organisational, and interdisciplinary perspectives to examine how modern analysts operate within evolving football performance environments.

1. INTRODUCTION

Performance analysis in sport aims to enhance understanding and inform decision-making through the objective use of video and data, with the ultimate goal of improving sporting performance. Performance analysis in football has evolved into an integral component of multidisciplinary performance support teams, contributing to coaching, player development, opposition analysis, and player recruitment (Andersen, Francis, & Bateman, 2022; Carling, Reilly, & Williams, 2014; Wright, Atkins, Polman, Jones, & Sargeson, 2012). The role now requires expertise in varied analytical processes, technology, and communication (Butterworth, 2023; Wright, Atkins, Jones, & Todd, 2013).

The growth of performance analysis has been driven largely by advances in technology, including video capture systems, automated and semi-automated tracking technologies, wearable technology, and increasingly sophisticated analysis software. Recent reviews of sport technology highlight the increasing role of artificial intelligence, computer vision, and advanced data visualisation systems in supporting performance analysis processes and decision making within sport environments (Cossich, Carlgren, Holash, & Katz, 2023; Woods, Robertson, Collier, & Davids, 2021). However, alongside these developments, analysts face human and organisational challenges such as time constraints, staffing limitations, financial resources, and varying levels of buy-in from coaches and players. Previous research examining applied sport environments has also highlighted the importance of communication and collaboration between analysts and coaching staff in ensuring that analytical insights are effectively integrated into coaching practice and wider subject matter experts (SMEs) (Bateman & Jones, 2019; Groom, Cushion, & Nelson, 2011).

Previous studies have examined areas such as player engagement with performance analysis (Wright, Carling, Lawlor, & Collins, 2016), coach perceptions and use of analysis (Martin, Swanton, Bradley, & McGrath, 2018) and interdisciplinary collaboration within high-performance sport (Burns & Collins, 2023). Despite growing research on performance analysis technologies and applied practice, limited work has examined how analysts implement these processes in real-world football environments, particularly in relation to workflows, collaboration, and practitioner perspectives. This study aims to investigate the technological processes, workflows, and perceptions of performance analysts within football.

1.1. Video Capture and Notational Analysis

Technological development has significantly enhanced video capture within football. Video capture is supported by a range of fixed, mobile, and automated camera systems across football environments (Barris & Button, 2008; Fele & Campagnolo, 2024; Hands & De Jonge, 2020; Linke, Link, & Lames, 2020; Valter, Adam, Barry, & Marco, 2006).

During training or matches, analysts utilise computerised notational analysis software such as Hudl Sportscode, Nacsport, and LongoMatch to code key performance indicators (KPIs) (Feist, Datson, Runswick, Harkness-Armstrong, & Pocock, 2025; Lord, Pyne, Welvaert, & Mara, 2020). These KPIs may include technical events, tactical actions aligned to a team's game model, and contextual indicators relevant to coaching objectives (Herold, Kempe, Bauer, & Meyer, 2021; Walsh, 2025). Analysis software supports telestration, visualisation, and feedback delivery (Bateman & Jones, 2019). Live video feeds enable real-time coding and increased feedback speed (Andersen et al., 2022). Audio communication systems allow analysts to provide real-time contextual insights to coaching staff in the technical area, enhancing in-game decision-making (Kröckel & Bodendorf, 2020).

1.2. Physical and Tracking Technologies

In addition to technical and tactical analysis, physical performance is a critical component of football analysis. Global positioning system (GPS) units are commonly used in training and, in some contexts, competition to quantify physical outputs such as total distance covered, high-speed running distance, sprint counts, and acceleration profiles (Modrić, Versic, & Sekulic, 2020). This data supports coaching decisions, load management, and injury prevention strategies, though the responsibility of GPS measurements may fall within the sport science department or the analysis department (Carling et al., 2014; McCall et al., 2015).

Emerging technologies, such as inertial measurement units (IMUs) (e.g., Playermaker), allow for the simultaneous assessment of physical outputs and technical actions, including number of touches, foot usage, and release velocity (Waldron, Harding, Barrett, & Gray, 2021). Recent research examining wearable technologies in sport highlights their growing ability to capture biomechanical, technical, and positional data simultaneously, supporting more integrated performance monitoring systems (Seçkin, Ateş, & Seçkin, 2023). Alternatively, in-stadium camera-based tracking systems provide automated or semi-automated physical metrics without the need for

wearable devices. This data is also increasingly used for scouting and recruitment purposes, enabling benchmarking and talent identification (Carling et al., 2014; Linke et al., 2020).

1.3. Post-Match and Post-Training Review

Following training sessions or matches, advances in technology allow analysts to swiftly share video and data with coaches, players, and other relevant stakeholders. Cloud-based platforms can provide immediate access to individual, unit, or team-level analysis, facilitating timely reflection and learning processes (Andersen et al., 2022; O'Donoghue, 2014). Post-performance analysis is then typically communicated through presentations delivered by analysts, coaches, or through collaborative approaches, highlighting key strengths, weaknesses, and learning points from performances (Hughes & Bartlett, 2002; O'Donoghue, 2014). These processes support integration into coaching practice.

Analysis software supports effective knowledge transfer through clipping, telestration, and data visualisation, while delivery formats vary depending on context. Feedback may be provided in full team meetings, unit-specific sessions, or individual player reviews, each offering different environments for reflection and development. Responsibility for delivering analysis also varies between clubs, influenced by organisational culture, staff expertise, and coaching preferences (Wright et al., 2012), though previous research highlights that it is usually the coach who leads analysis feedback sessions to the players (Bateman & Jones, 2019; Wright et al., 2012). Previous research examining player engagement with video feedback suggests that performance analysis can enhance players' tactical understanding, reflection, and learning processes when delivered through clear communication and appropriate pedagogical approaches (Mackenzie & Cushion, 2013; Wright et al., 2016).

Importantly, performance analysis operates within a continuous coaching and analysis cycle. Post-match reviews inform subsequent training design and pre-match preparation, while pre-match opposition analysis supports tactical planning and strategy development. Training sessions may align with these insights or be structured according to broader tactical periodisation frameworks (Andersen et al., 2022).

1.4. Challenges and Perspectives in Performance Analysis

Despite its widespread adoption, performance analysis faces several challenges within football, some of which are related to workload, time constraints, and resource limitations. Analysts are often responsible for a wide range of tasks, including live coding, post-match analysis, opposition scouting, training support, data management, technology maintenance, and ad hoc coach requests. In environments with limited staff, infrastructure and resources, these demands can result in inefficient workflows and extended working hours (Wright et al., 2012).

Additionally, levels of buy-in from coaches and players vary between clubs. High-performance football environments also rely heavily on collaboration between multiple support disciplines and SMEs, including coaching, sport science, medical, and performance analysis departments. Research examining interdisciplinary performance teams has highlighted the importance of effective knowledge sharing and communication across these roles to support integrated performance preparation and decision making (Bourbousson, Sève, & McGarry, 2010; McCall et al., 2015). A recent scoping review of interdisciplinary practice in high-performance sport further emphasised the importance of structured collaboration and shared decision-making processes between support disciplines in order to maximise the impact of performance support teams (Burns & Collins, 2023). While performance analysis is broadly accepted within modern football, not all stakeholders engage equally with analytical processes, influencing how analysis is utilised and valued within different organisational contexts (Hughes, Franks, & Dancs, 2019). Research examining coaches' use and perceptions of performance analysis suggests that while coaches widely recognise the value of analysis, its integration into coaching practice often depends on effective communication and alignment between analysts and coaching staff (Martin et al., 2018). These factors contribute to varied experiences, benefits, and challenges for analysts across the football landscape.

Linking to various points surrounding the challenges of analysis, research examining practitioners' experiences with performance analysis technologies has highlighted both the opportunities and practical constraints associated with their implementation within football environments, including issues related to infrastructure, data integration, and practitioner workload (Davidson, Barrett, Toner, & Towlson, 2024).

1.5. Rationale

Performance analysis plays a vital role in contemporary football, supported by a rapidly expanding technological ecosystem. However, the workflows, tools, and perceptions associated with analysis vary considerably between clubs and continue to evolve over time. Existing research highlights changes in analysis practices across historical periods (Barris & Button, 2008; Hughes & Franks, 2004; O'Donoghue, 2014), but there remains a lack of contemporary insight into how analysts currently experience and implement technology within their roles.

This research aims to provide an up-to-date examination of the technological processes and perspectives of performance analysts within football. By exploring technologies used across different levels of the game, associated benefits, challenges, and practitioner experiences, this research seeks to inform analysts, coaches, and football organisations and to support the continued development of effective and sustainable performance analysis practices.

2. MATERIALS AND METHODS

2.1. Study Design

This study adopted a mixed-methods, cross-sectional survey design to explore the technological processes, practices, and perceptions of performance analysts working within professional and semi-professional football environments. A mixed-methods approach enabled the integration of descriptive quantitative insights on analytical practices with qualitative exploration of analysts' perspectives, challenges, and perceived impact. Such designs are increasingly utilised within football performance analysis research to capture both the breadth and depth of applied practice within complex sociotechnical environments (McGarry, O'Donoghue, & Sampaio, 2013). This integration aligns with guidance for mixed-methods research in applied sport and health sciences, where combining numerical and open-ended data supports a richer understanding of practitioner contexts (Mathers, Fox, & Hunn, 2007).

2.2. Participants

Thirty-eight performance analysts participated in the study. Eligible individuals were aged 18 years or older and were either currently working or had worked within the previous two years in a football performance analysis-related role (e.g., performance analyst, video analyst, opposition analyst, data analyst). Participants represented a range of professional and semi-professional football settings, including senior and youth environments, and were based across both UK and international contexts. Roles varied in employment status (paid/unpaid; full-time/part-time), experience level, and disciplinary background. Purposive sampling was used to target practitioners embedded within football performance environments, consistent with methodological approaches commonly adopted when accessing specialised applied sport populations (Patten, 2015).

2.3. Instrumentation

Data were collected using a bespoke online questionnaire developed and administered via Microsoft Forms. The instrument captured information across four domains.

1. Demographic and professional background (e.g., role, experience, qualifications, working hours, competitive level).
2. Technological processes used for live training and match capture, post-event analysis, and presentation practices.

3. Analytical workflows and interdisciplinary engagement, including multidisciplinary meetings and collaborative processes.
4. Perceptions of impact, challenges, and future developments within performance analysis.

The survey comprised a combination of closed-ended questions (multiple-choice and tick-all-that-apply formats) and open-ended items that allowed participants to elaborate on challenges, perceived impacts, and anticipated technological trends. This structure facilitated quantitative summarisation of current practice and qualitative insight into practitioner experiences, aligning with mixed-methods survey approaches in football science literature (Nassis, Brito, Figueiredo, Gabbett, & Sampaio, 2020). The instrument was reviewed by researchers with expertise in performance analysis to ensure content validity and applied relevance.

2.4. Procedure

Following institutional ethical approval, the questionnaire link was distributed electronically. Participants were presented with detailed study information outlining the purpose of the research, data handling procedures, and their right to withdraw prior to data anonymisation and analysis. Informed consent was obtained electronically before participants could proceed. The survey took approximately 15 minutes to complete. Responses were collected anonymously, with email addresses stored separately for the sole purpose of disseminating results and contacting volunteers for potential follow-up interviews, in accordance with data protection guidelines.

2.5. Data Analysis

2.5.1. Quantitative Analysis

Quantitative data were summarised using descriptive statistics, including frequencies and percentages, to characterise participant demographics, technological practices, and analytical processes. This descriptive approach is appropriate for exploratory applied research aimed at mapping current practice rather than testing inferential hypotheses.

2.5.2. Qualitative Analysis

Open-ended responses were analysed using reflexive thematic analysis following Braun and Clarke's (2006) six-phase process: familiarisation, coding, generating themes, reviewing themes, defining and naming themes, and producing the final analytic narrative. In addition to this process, elements of narrative-informed interpretation were incorporated to consider how analysts described their professional journeys, challenges, and expectations. This supplementary lens supported detail on how meaning was constructed within participants' short written accounts, acknowledging that practitioners often frame experiences through brief narrative structures even in survey formats (Riessman, 2008; Smith & Sparkes, 2012). An inductive approach was adopted, allowing themes to emerge naturally from the data, in line with previous football performance analysis research examining professional practice and sociotechnical systems (Bourbousson et al., 2010; Wright et al., 2016).

2.6. Ethical Considerations and Trustworthiness

Ethical approval was granted by the University Campus of Football Business (UCFB) ethics committee (Ethics Code: CM120625LJ). All participants provided informed consent, and confidentiality was maintained through anonymisation of responses. Data were stored securely and analysed only after the predetermined anonymisation date. To enhance qualitative trustworthiness, reflective analytic notes were maintained throughout the analysis process, and theme development was discussed among the research team to support analytical rigour and transparency, consistent with best practice in applied qualitative sport research.

3. RESULTS

Following data screening, responses from participants with incomplete consent or non-relevant roles were removed. This resulted in a final sample of 38 performance analysts whose responses were included in the analysis.

3.1. Participant Characteristics and Professional Background

The most common role title reported was a 'performance analyst', accounting for 55% of respondents. Other reported roles included academy analyst and related variations.

Employment status varied across respondents, with 61% reporting paid roles and 39% reporting unpaid positions. In terms of employment structure, 58% of analysts worked part-time, while 42% worked full-time.

Participants reported working an average of 30.19 ± 18.2 hours per week in their analysis role, with reported workloads ranging from 5 to 75 hours per week ($n = 37$). Differences were evident between employment types. Analysts working in full-time roles reported working 49.4 ± 13.0 hours per week (range = 32–75; $n = 11$), whereas those in part-time roles reported working 18.7 ± 7.6 hours per week (range = 5–30; $n = 15$).

Participants were primarily engaged in professional football environments. Professional club youth teams represented 42.1% of respondents, followed by professional senior teams (39.5%), semi-professional senior teams (15.8%), and semi-professional youth teams (2.6%). Most analysts reported working with male teams (74%), while 18% worked with women's teams, 5% worked with both genders, and 3% reported other contexts.

The mean experience as an analyst was 3.59 years, with a median of 2 years and a range from 0.25 to 18 years. 34 male and 4 female respondents took part. Age distribution showed 45% of participants aged 25–34, 39% aged 18–24, and 16% aged 35–44.

All participants reported holding a form of higher education qualification, mainly at the master's level (72%). The majority of respondents (84%) reported holding a performance analysis or related degree, while 16% reported higher education qualifications in other disciplines. Participants also reported a range of coaching qualifications, with FA Level 1 certification the most commonly reported qualification.

Participant demographic characteristics are summarised in Table 1.

Table 1. Participant characteristics.

Characteristic	Category	n	%
Employment status	Paid	23	61
	Unpaid	15	39
Employment type	Full-time	16	42
	Part-time	22	58
Team gender	Male	28	74
	Female	7	18
	Both	2	5
	Other	1	3
Age group	18–24	15	39
	25–34	17	45
	35–44	6	16
Participant gender	Male	34	89
	Female	4	11

3.2. Analytical Roles and Responsibilities

Participants reported involvement in a wide range of analytical tasks. The most frequently reported responsibility was video analysis, reported by 92.1% of participants. Other commonly reported tasks included opposition analysis (84.2%), individual player analysis (84.2%), and match analysis (84.2%). Additional responsibilities included general team analysis (73.7%), data analysis (65.8%), and set-piece analysis (60.5%). Less frequently reported

tasks included scouting and recruitment analysis (44.7%), training analysis (44.7%), wearable technology analysis (23.7%), and coach analysis (18.4%).

A summary of analytical responsibilities reported by participants is presented in Table 2 and Figure 1, highlighting the number and percentage of analysts in the sample who engage in each analytical task.

Table 2. Analytical responsibilities of participants.

Analytical Task	n	%
Video analysis	35	92.1
Opposition analysis	32	84.2
Individual analysis	32	84.2
Match analysis	32	84.2
Team analysis	28	73.7
Data analysis	25	65.8
Set piece analysis	23	60.5
Scouting & recruitment	17	44.7
Training analysis	17	44.7
Wearable technology	9	23.7
Coach analysis	7	18.4

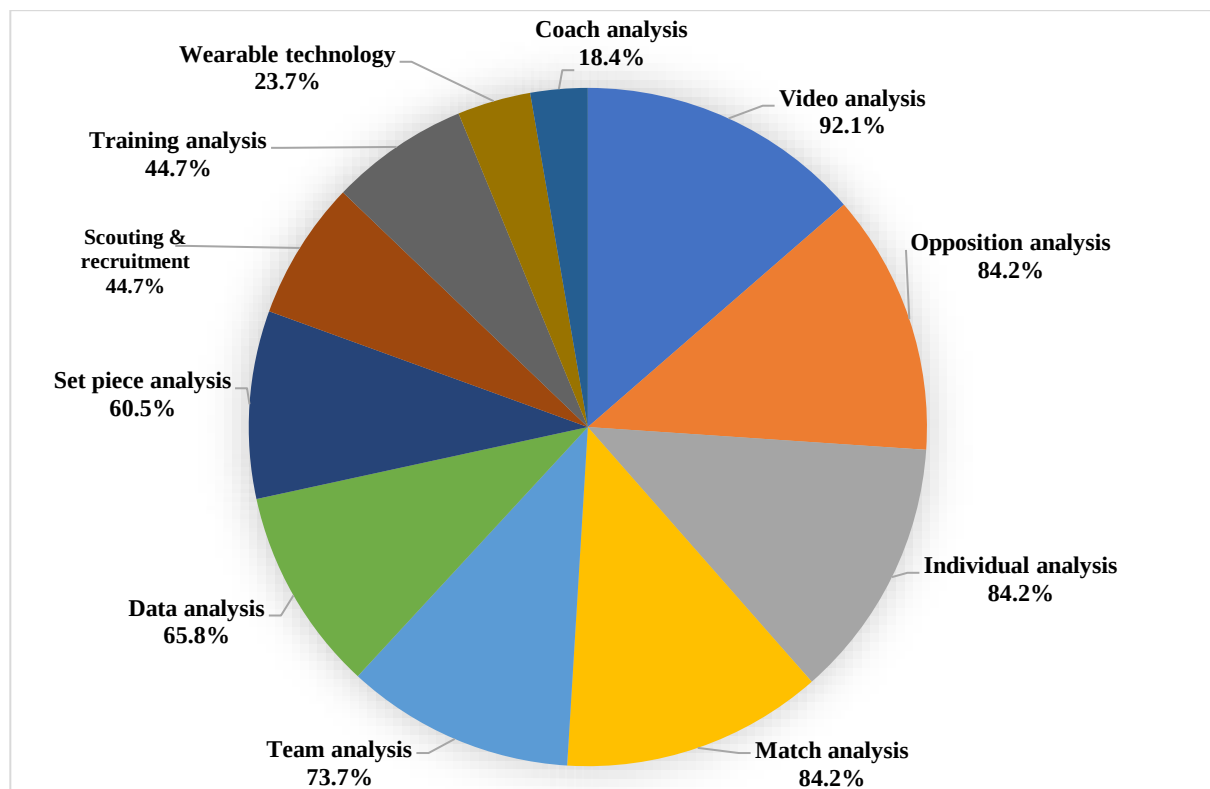


Figure 1. Analytical responsibilities of participants: A graphical representation of Table 2.

Source: Such a graphical representation was inspired by a chart depicted in Wright et al. (2013).

3.3. Technological Processes in Training and Match Analysis

3.3.1. Training Capture Processes

Participants reported using a range of technologies and approaches to capture video and data during training sessions.

Manual video recording was reported by 44.7% of participants, while 52.6% reported using performance analysis software tools (e.g., Hudl Sportscode) during training. AI camera systems were used by 15.8%, while IP camera

systems were reported by 13.2%. Wearable technology usage during training was less common, with GPS units used by 18.4% of participants and Playermaker units used by 7.9%. A small proportion of participants (5.3%) reported using live feeds during training capture. 23.7% of participants reported that no live video or data collection occurred during training sessions. A further 23.7% selected “other”, including alternative capture approaches such as drone recording.

Technologies used to capture live training video and data are illustrated in Figure 2.

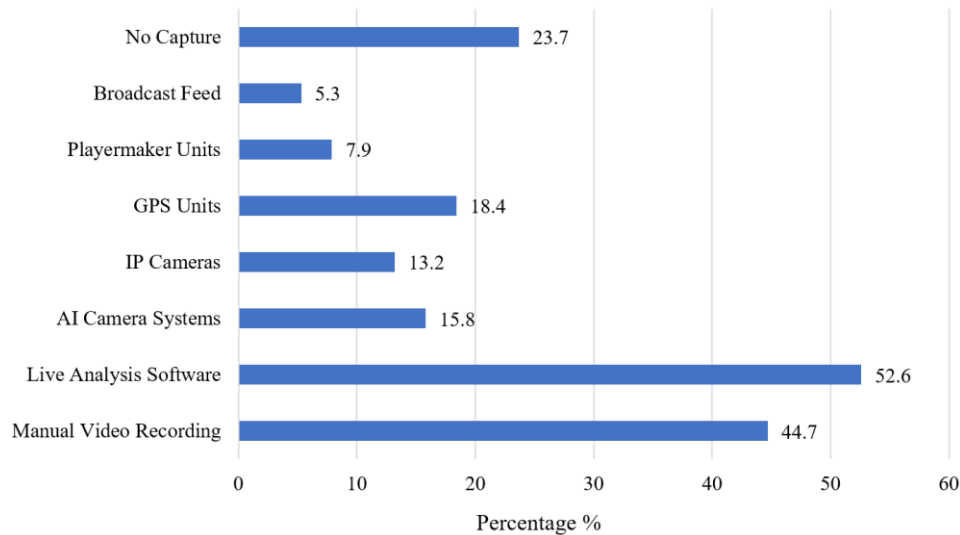


Figure 2. Technologies used to capture live training video and data.

3.3.2. Match Capture Processes

Participants reported a range of methods for capturing video and data during matches. The most commonly reported approaches were manual video recording and live performance analysis software, both used by 57.9% of participants. AI or automated camera systems were reported by 36.8% of participants, while broadcast feeds and GPS units were each reported by 18.4%. Other approaches included IP camera systems (13.2%), live event data providers (10.5%), and Playermaker units (5.3%). Only 2.6% reported using live tracking data providers.

Technologies used during match capture are presented in Figure 3.

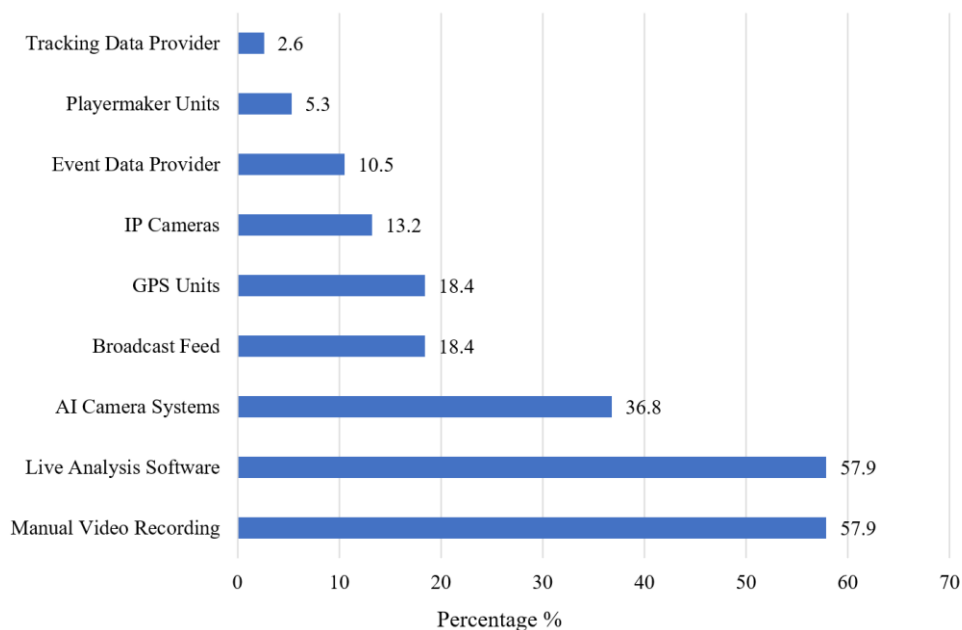


Figure 3. Technologies used during match capture.

3.3.3. Challenges in Live Capture

Participants reported several challenges associated with live video and data capture.

During training capture, 34.2% of respondents reported no challenges.

Among those reporting challenges, technology issues (28.9%), equipment requirements (28.9%), and infrastructure limitations (28.9%) were the most commonly cited constraints. Additional challenges included time constraints (26.3%), financial limitations (23.7%), and staff shortages (18.4%).

During match capture, challenges were reported more frequently. Infrastructure constraints were the most commonly reported challenge (42.1%), followed by technology issues (39.5%), time constraints (28.9%), financial limitations (28.9%), equipment requirements (23.7%), and staff shortages (21.1%).

3.3.4. Post-Performance Analysis Tools

Participants reported using a wide range of software platforms and tools for post-match and post-training analysis.

The most frequently reported software platform was Hudl Sportscode (57.9%), followed by Hudl.com (52.6%). Data analysis tools such as Excel (44.7%) and Tableau (44.7%) were also widely used, alongside presentation software including PowerPoint (39.5%) and Keynote (34.2%). External data and video providers were reported by 31.6% and 26.3% of participants, respectively.

A summary of the post-analysis software used by participants is presented in Table 3.

Table 3. Software used for post-match and post-training analysis.

Software	n	%
Hudl Sportscode	22	57.9
Hudl.com	20	52.6
Excel	17	44.7
Tableau	17	44.7
PowerPoint	15	39.5
Keynote	13	34.2
Data providers	12	31.6
Video providers	10	26.3
iMovie	8	21.1
InPlayOnline	6	15.8
Nacsport	5	13.2
Metrica	3	7.9

Participants also reported varying durations required to code matches following the competition. After removing an extreme outlier response of 60 hours, on average analysts reported spending 3.59 hours coding post-match footage (SD = 2.24; range = 0.43–12.5 hours; n = 35).

3.4. Delivery of Analysis to Players

Participants reported delivering analysis through full team, unit or small group, and individual player sessions. Across all formats, delivery was predominantly in person, with 92% of full team sessions reported as being delivered face-to-face. Full team analysis sessions most commonly lasted 0–1 hour per week (42.1%), followed by 1–2 hours (26.3%). These sessions were primarily delivered by the head coach (60.5%), followed by performance analysts (23.7%).

Unit and small group sessions were most commonly reported as 0–1 hour per week (57.9%), with the head coach (42.1%) again the most common presenter.

Individual player analysis sessions were also typically 0–1 hour per week (55.3%), with delivery most frequently attributed to the head coach (36.8%).

Across all formats of analysis delivery, sessions were frequently reported as interactive, with the majority of respondents reporting sessions as either interactive or sometimes interactive.

3.5. Multidisciplinary and Interdisciplinary Collaboration

The majority of participants (89.5%) reported that their teams held multidisciplinary meetings involving multiple staff departments, while 10.5% reported that such meetings did not occur.

Meeting frequency varied, with the most commonly reported schedule being once per week (26.3%), followed by daily meetings (18.4%) and sporadic meetings (15.8%).

Participants generally reported positive perceptions regarding the impact of multidisciplinary meetings on their work. 42.1% reported a positive impact, while 23.7% reported a very positive impact.

Participants also reported that their analysis contributed to multiple areas within football environments, most frequently tactical and strategic decision-making (94.7%), team selection decisions (57.9%), and internal talent appraisal processes (55.3%).

In addition to contributing to other departments, analysts also reported that collaboration with other disciplines influenced their own analytical practices. Improvements were reported in several areas, including technical or tactical knowledge (89.5%), video analysis practice (76.3%), and overall analytical approaches such as identifying more effective key performance indicators (73.7%).

Participants also reported that their analysis practice was informed by a range of other staff disciplines. Coaching staff was reported by all participants (100%), followed by scouting and recruitment staff (52.6%), sport science staff (39.5%), player care staff (13.2%), medical staff (7.9%), and psychological staff (7.9%).

Participants reported mixed views regarding whether multidisciplinary meetings progressed into interdisciplinary practice.

While 47.4% of respondents indicated that meetings resulted in interdisciplinary collaboration, 31.6% reported that they did not lead to interdisciplinary working practices.

Among participants whose teams did not currently hold multidisciplinary meetings, the majority indicated that such meetings would likely be beneficial to staff practice (26.3%), while only one participant (2.6%) indicated that they would not be beneficial.

3.6. Career Pathways, Challenges, and Future Developments

3.6.1. Entry Pathways

Participants reported several pathways into football performance analysis. The most common route was through a Master's degree (63.2%), followed by undergraduate degrees (42.1%) and internships (42.1%). Other entry routes included self-taught development (18.4%) and short courses or professional accreditation (13.2%).

3.6.2. Key Challenges

Participants reported several challenges associated with working in performance analysis roles. The most frequently reported challenges were pay or salary (81.6%), high workload (76.3%), and working hours (57.9%). Other reported challenges included adequate analysis equipment (42.1%) and working conditions (21.1%).

These challenges are illustrated in Figure 4.

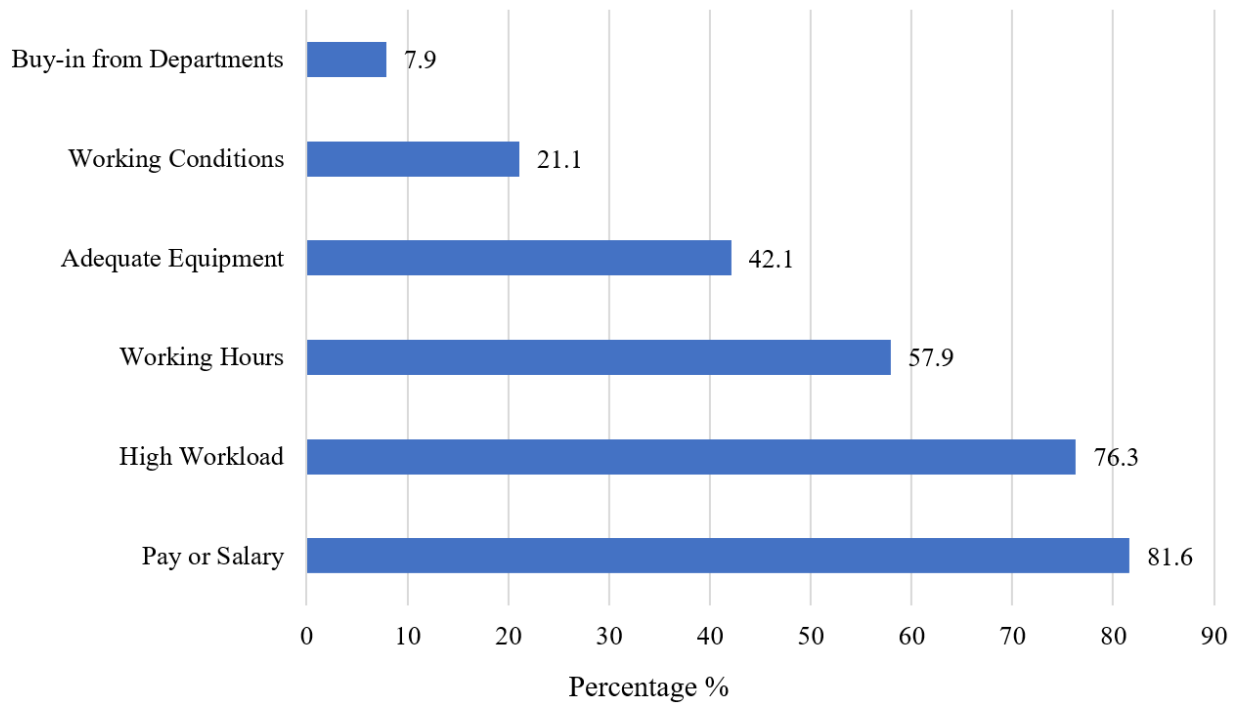


Figure 4. Career pathways and challenges for analysts.

3.6.3. Perceived Impact of Analysis

Participants reported a range of perceived impacts resulting from their analysis practice. The most commonly reported impacts were improved match performance (89.5%), improved match preparation (86.8%), and improved training performance (68.4%). Additional perceived impacts included improvements in internal talent appraisal processes, talent development programmes, recruitment practices, and sport science practice.

These perceived impacts are illustrated in Figure 5.

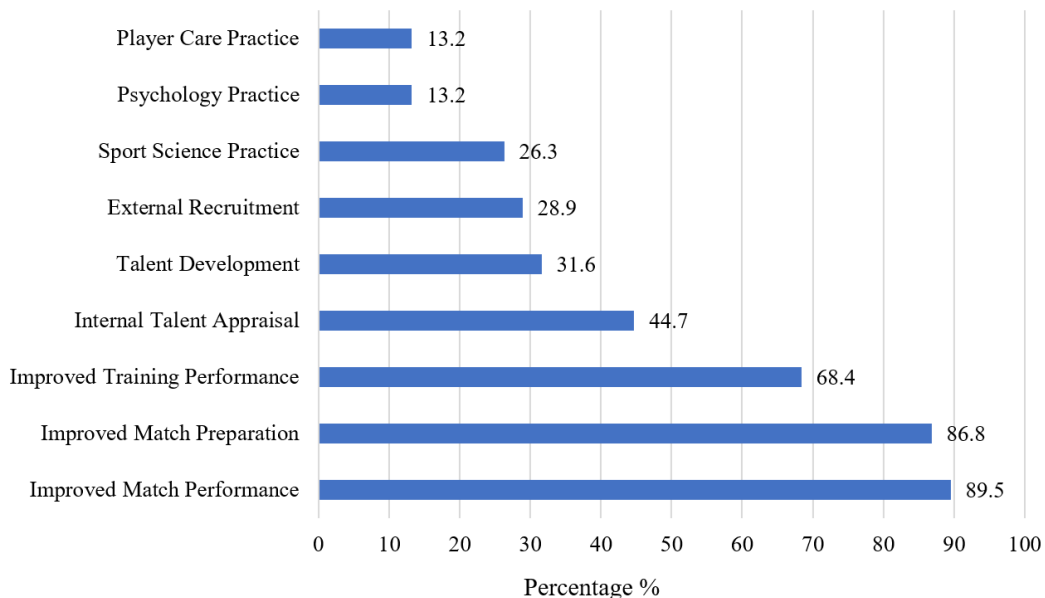


Figure 5. Perceived impact of analysis.

3.6.4. Future Technological Developments

Thematic analysis of open-ended responses regarding future technological developments identified several recurring themes.

The most prominent theme was the increased use of artificial intelligence and automation, particularly in relation to automated video coding and workflow optimisation. Respondents also frequently referenced the growing use of tracking technologies and integrated data sources, alongside expectations of real-time analytical capabilities during matches. A smaller number of responses highlighted the development of more advanced analytical tools and integrated software platforms to support analysis practice.

Participants also described expectations of changes to the analyst role, with greater emphasis on interpreting and communicating insights. Other anticipated developments included advances in video capture technologies, greater integration of performance data, and increased accessibility of analysis technologies across different levels of football.

3.7. Data Availability

Survey data is available from the corresponding author upon reasonable request.

4. DISCUSSION

Performance analysis is widely recognised as a key mechanism for improving decision-making and understanding of performance in sport environments. The findings of this study provide contemporary insight into the technological workflows, collaborative practices, and professional challenges experienced by analysts across professional and semi-professional contexts.

4.1. Key Themes

4.1.1. Demographic Profile and Career Pathways of Performance Analysts

The findings suggest a relatively early-career workforce, consistent with the recent expansion of performance analysis roles (Wright et al., 2012). The experience levels reported within the present sample may reflect both the continued growth of the profession and the increasing number of educational pathways that now feed into analysis roles. The sample was predominantly male (89%), reflecting the gender imbalance that continues to characterise many football performance analysis environments (Harkness-Armstrong, Seth, Lowry, & Datson, 2025).

Education and internships were key entry pathways for the participant analysts. Despite the prevalence of higher education qualifications, the profession remains characterised by varied entry routes. A proportion of respondents reported self-taught development or short professional courses as pathways into analysis roles, indicating that the field continues to accommodate diverse professional trajectories. This diversity of pathways may reflect the applied and evolving nature of performance analysis, where technological literacy, contextual football knowledge, and the ability to translate analytical insight into coaching practice are key competencies (Francis, Kyte, & Bateman, 2024).

Frameworks examining professional practice within applied performance analysis often highlight the importance of integrating technical expertise, domain knowledge, and communication skills in order to effectively translate analytical insights into applied coaching environments (Martin, O'Donoghue, Bradley, & McGrath, 2021). In practice, this integration enables analysts to deliver contextually relevant feedback that supports decision-making, player learning, and the refinement of coaching strategies within football environments.

4.2. Technological Workflows in Training and Match Analysis

The findings highlight the central role video capture and notational analysis technologies play within contemporary football analysis workflows. Video analysis was reported as the most common analytical responsibility among participants, reinforcing previous literature identifying video-based analysis as a cornerstone of modern performance analysis practice (Hughes & Bartlett, 2002; O'Donoghue, 2014). Analysts reported utilising video analysis, which likely informed opposition analysis, individual analysis, match analysis, team analysis, set piece

analysis, scouting and recruitment, training and coach analysis tasks, complementing previous work in the field that uncovered the varied tasks analysts complete (Hughes & Bartlett, 2002; O'Donoghue, 2014; Wright et al., 2013).

Despite continued technological advancement, traditional capture methods remain widely used within many football environments (Fele & Campagnolo, 2024). Manual video recording was the most commonly reported method of capturing both training and match footage, even though automated camera systems and tracking technologies are increasingly available within the sport. This finding supports earlier work suggesting that financial resources, infrastructure availability, and organisational priorities can limit the adoption of advanced analysis technologies within some football environments (Barris & Button, 2008). Recent applied research examining performance analysis practices in elite women's football similarly reported the central role of video analysis, manual coding processes, and collaboration between analysts and coaching staff within professional football environments (Harkness-Armstrong et al., 2025).

Wearable and tracking technologies have expanded rapidly within sport and football performance monitoring systems, providing increasingly detailed information on physical and technical performance variables (Castillo, Carmona, Sánchez, & Ortega, 2018; Linke et al., 2020; Modrić et al., 2020). However, the present findings suggest that the integration of these technologies within analysis workflows varies between football environments. While a proportion of participants reported using GPS devices or Playermaker IMUs, their usage levels were considerably lower than those reported for video analysis systems. However, the present findings suggest that these technologies may not yet be consistently integrated across all football contexts. This discrepancy may reflect variations in club resources, staff expertise, or the division of responsibilities between performance analysis and sport science departments, with physical performance appraisal generally falling under the latter (Modrić et al., 2020).

Computerised notational analysis systems have become fundamental tools within football performance analysis, enabling analysts to systematically capture, organise, and interpret performance events within training and competition environments (Lord et al., 2020). The results further demonstrate the continued importance of established analysis software platforms within football environments. Hudl Sportscode was reported as the most frequently used post-performance analysis tool among participants. This aligns with previous research identifying notational analysis platforms such as Sportscode as dominant tools within professional football analysis workflows (Andersen et al., 2022). In addition to dedicated analysis software, analysts reported extensive use of general-purpose data and presentation tools such as Excel, Tableau, PowerPoint, and Keynote. This combination of specialised and general analytical tools reflects the hybrid technological ecosystem within which modern analysts operate, integrating video coding, data processing, visualisation, and communication functions (Butterworth, 2023; Cossich et al., 2023). No meaningful relationship between coding time and the number of software tools used was found, indicating that analysts with access to a greater number of analytical platforms did not necessarily complete coding tasks faster.

4.3. Delivery of Analysis to Players

The delivery of analysis insights to players represents a central component of the analysis workflow. The findings suggest that analysis is primarily delivered through face-to-face sessions with players, including full team meetings, unit or positional reviews, and individual player sessions.

The results indicate that coaches rather than analysts most frequently deliver analysis insights to players during team sessions. While analysts often prepare video clips, statistical summaries, and tactical insights, the responsibility for communicating these insights typically remains with coaches (Bateman & Jones, 2019; Martin et al., 2018; Wright et al., 2012). Whilst coaches were most commonly responsible for delivering analysis to players, research examining elite football players' engagement with performance analysis suggests that players may also value direct interaction with analysts during feedback sessions, as analysts can provide detailed tactical explanations and technical insights that support player understanding (Wright et al., 2016). This suggests that increased analyst involvement in analysis

delivery may be beneficial in certain contexts, particularly within unit or individual review sessions where more detailed tactical discussion may occur. This interpretation is supported by the present findings, which indicate that although coaches remained the most common presenters across all formats, their dominance reduced as sessions shifted from full-team meetings towards smaller unit and individual analysis sessions. Regardless of who presents, maintaining effective coach–analyst collaboration during feedback processes has also been identified as important for ensuring analytical insights are effectively integrated into coaching practice (Bateman & Jones, 2019).

Previous research exploring perceptions of performance analysis in elite youth football has similarly highlighted the importance of effective communication and player engagement in ensuring that analytical insights are understood and applied within training and competition contexts (Reeves & Roberts, 2013). Research examining elite football players' engagement with performance analysis has also demonstrated that interactive video feedback can support players' tactical understanding and reflective learning processes within team environments (Wright et al., 2016). The high levels of interactivity reported within analysis sessions further emphasise the collaborative nature of learning environments within football teams. The majority of respondents reported that analysis sessions were either interactive or sometimes interactive, suggesting that modern performance analysis delivery frequently involves discussion and reflection rather than purely directive instruction. Communication technologies and live feedback systems have also been shown to facilitate real-time exchanges between analysts and coaching staff during performance contexts (Kröckel & Bodendorf, 2020), highlighting the importance of communication structures in integrating analytical insight into coaching decision-making (Richards, Collins, & Mascarenhas, 2017).

4.4. Multidisciplinary and Interdisciplinary Collaboration

A further key finding of the study relates to the widespread presence of multidisciplinary collaboration within football performance environments. The majority of participants reported that their teams hold multidisciplinary meetings involving staff from multiple departments, including coaching, sport science, medical, and analysis personnel. These meetings were generally perceived positively, indicating that analysts recognise the value of collaborative communication across staff disciplines (Coutts, 2017; Wright et al., 2013).

However, the results also indicate that multidisciplinary interaction does not always translate into fully interdisciplinary practice. While many participants reported that multidisciplinary meetings led to integrated working practices, a substantial proportion indicated that these meetings did not necessarily result in fully collaborative decision-making processes.

The findings also highlight the reciprocal nature of collaboration between analysts and other staff disciplines. Participants reported that their analysis contributes most strongly to tactical decision-making, team selection processes, and internal talent appraisal (McLean, Salmon, Gorman, Read, & Solomon, 2017). Conversely, analysts reported that their own analytical practices are informed by coaching staff, scouting departments, and sport science practitioners. Collaboration with other staff roles was reported to improve analysts' tactical understanding, video analysis practice, and the development of more effective key performance indicators. The development of meaningful performance indicators is widely recognised as a critical component of effective analysis practice (Herold et al., 2021) and interdisciplinary collaboration may support analysts in developing more contextually relevant performance metrics aligned with coaching objectives.

These findings also support the idea that performance analysis operates within a continuous performance analysis cycle, where match analysis informs training design and pre-match preparation, and insights generated across disciplines contribute to ongoing performance development. Such cyclical processes have been highlighted within contemporary football analysis frameworks that emphasise the integration of coaching, analysis, and performance support roles (Andersen et al., 2022).

Research examining coordination within elite team sport environments has highlighted the importance of information exchange between analysts, coaches, and other support staff in supporting collective decision-making processes (Bourbousson et al., 2010).

4.5. Challenges and Future Developments in Performance Analysis

Despite the increasing integration of analysis within football organisations, participants reported several significant challenges associated with working in performance analysis roles. Salary, workload, and working hours were the most commonly reported challenges among respondents, matching previous research findings (Bateman & Jones, 2019; Butterworth, 2023; Wright et al., 2013; Wright et al., 2012).

Resource-related challenges were also evident within the results. Participants reported limitations related to equipment availability, infrastructure, and financial constraints. Such findings reinforce previous observations that financial investment and organisational infrastructure play an important role in shaping technological adoption within sport performance environments (Barris & Button, 2008). Overall, match capture appeared to present slightly greater operational challenges than training capture, particularly in relation to infrastructure and technological reliability. This finding aligns with previous research examining practitioners' perceptions of performance analysis technology within elite academy environments has also identified both opportunities and practical constraints associated with technological integration, including infrastructure limitations and the need for efficient data management processes (Davidson et al., 2024).

Participants anticipated that technological developments would significantly influence the evolution of performance analysis roles. The most prominent anticipated development was the increasing use of artificial intelligence and automated systems within analysis workflows. Respondents suggested that AI technologies may automate aspects of video coding, tagging, and data processing, potentially reducing the time analysts spend on manual tasks. Recent literature suggests that artificial intelligence, automated tracking systems, and integrated data platforms are likely to significantly reshape performance analysis workflows in football over the coming decade (Cossich et al., 2023; Plakias, Kokkotis, Giakas, Tsaopoulos, & Moustakidis, 2024). Performance analysis research also indicates a rapidly expanding focus on computer vision, machine learning, and integrated tracking data within the field (Plakias, Kokkotis, Mitrotasios, et al., 2024). However, some data collection companies are more hesitant to launch AI-assisted products due to data collection errors (Magesh et al., 2025).

However, participants also suggested that automation may lead to a shift in the nature of the analyst role rather than reducing its importance. As automated technologies increasingly undertake technical data processing tasks, analysts may become more focused on interpretation, contextual understanding, and the communication of insights to coaching staff. Such developments reflect broader trends within sport analytics and data science, where technological innovation reshapes professional roles and places greater emphasis on translating complex data into actionable performance insights. This perspective aligns with research suggesting that technological developments in sport should be viewed as tools that augment practitioner perception and decision-making rather than replacing human expertise within coaching and performance analysis processes (Woods et al., 2021).

5. LIMITATIONS

Several limitations should be considered when interpreting the findings of this study. First, the sample size was relatively modest, with 38 participants included in the final analysis. While this sample provided valuable insight into contemporary performance analysis practices, it may not fully represent the diversity of technological workflows and organisational structures present across the global football landscape. In particular, the distribution of participants across varied levels of professional and semi-professional environments may influence the technologies and resources available to analysts, potentially shaping their experiences and practices. If, for example, the sample featured analysts working in the top divisions in the top five European leagues, the findings may differ. Additionally, the survey

captured responses from analysts working across different competitive levels, organisational structures, and national contexts. While this diversity provides a broad overview of contemporary analysis practice, it also introduces variability that may influence the comparability of technological processes between clubs. For example, analysts working in elite professional environments may have access to more advanced technological infrastructure than those operating within lower-resourced settings, reflecting the influence of financial and organisational factors within performance analysis environments (Barris & Button, 2008; Cossich et al., 2023; Davidson et al., 2024).

Second, the study relied on self-reported survey responses, which may introduce potential biases related to participant interpretation, recall, or subjective perceptions. Although the questionnaire captured both quantitative and qualitative insights, the findings represent participants' perspectives rather than direct observation of analysis practices within clubs. Survey-based approaches are commonly used within applied sport research to explore practitioner perspectives, but are inherently limited by the subjective nature of participant responses (Mathers et al., 2007).

Finally, while the qualitative responses provided useful insight into analysts' perceptions of technological developments and professional challenges, the survey format limited the depth of narrative detail that could be captured. Future studies may therefore benefit from follow-up interviews or case studies to explore practitioner experiences and technological workflows in greater depth, an approach that has been recommended within qualitative sport research exploring applied practice (Smith & Sparkes, 2012).

6. PRACTICAL IMPLICATIONS

The findings of this study provided several practical insights for football clubs, analysts, and sports organisations seeking to optimise performance analysis practices. Firstly, the continued reliance on manual video capture within many environments highlights the importance of organisational investment in technological infrastructure. While automated camera systems and integrated tracking technologies are increasingly available within football, their adoption may be constrained by financial or logistical factors (Barris & Button, 2008; Cossich et al., 2023; Davidson et al., 2024). Clubs seeking to enhance analytical workflows may therefore benefit from evaluating the cost-effectiveness and practical integration of emerging capture technologies.

Secondly, the results emphasise the importance of effective communication between analysts, coaching staff, and other SMEs. As analysis delivery was most commonly reported to occur through coach-led sessions, analysts must ensure that their insights are communicated in ways that align with coaching objectives and pedagogical approaches. Previous research has highlighted the importance of the relationship and communication processes between analysts and coaches in translating analytical insight into actionable performance feedback (Bateman & Jones, 2019; Kröckel & Bodendorf, 2020; Wright et al., 2012). When analysts do deliver, which appears to be more likely in units or individual feedback sessions, effective delivery is, of course, required as this can enhance learning and understanding of tactical concepts (Wright et al., 2016).

Thirdly, the findings highlight the importance of multidisciplinary collaboration within football organisations. While multidisciplinary meetings were widely reported in the present study, the results suggest that these interactions do not always lead to fully interdisciplinary practice. Developing structured collaborative processes may therefore help improve knowledge integration and transfer between performance analysis, sport science, medical, and coaching departments, supporting more effective performance support systems (Andersen et al., 2022). This is where analysts may become effective knowledge brokers, working as part of an interdisciplinary team.

In addition to the applied insights generated by this study, the findings also support a conceptual understanding of football performance analysis as a sociotechnical system (McLean et al., 2017) in which technological tools, practitioner expertise, and organisational collaboration interact to shape performance support processes. Within this system, technological infrastructure enables the capture and processing of performance information, analysts interpret and translate this information into meaningful insights, and coaches and multidisciplinary staff integrate

these insights into tactical preparation, player development, and decision-making processes. The results illustrate how these elements operate collectively within football environments, highlighting the interconnected relationship between technology, analyst practice, and collaborative performance support structures.

Finally, the anticipated growth of artificial intelligence and automation within performance analysis workflows suggests that analysts may increasingly require skills related to data interpretation, communication, and decision support. As analytical technologies continue to evolve, educational programmes and professional development opportunities may need to adapt to ensure analysts possess the competencies required to interpret complex datasets and communicate insights effectively within coaching environments (Hughes & Bartlett, 2002).

7. THEORETICAL IMPLICATIONS & FUTURE RESEARCH DIRECTIONS

This study contributes to the theoretical knowledge of performance analysis practice within football by providing contemporary insight into the sociotechnical systems that underpin analyst workflows. Previous literature has often examined individual components of performance analysis, such as technological tools, coach engagement, or player learning processes, in isolation. The present findings highlight how technological processes, practitioner roles, and organisational collaboration interact to shape analysis practice within real football environments. In doing so, this research extends existing professional practice frameworks by illustrating how analysts operate within hybrid technological and interdisciplinary systems, where traditional video analysis methods coexist alongside emerging automated and data-driven technologies. These findings contribute to the evolving conceptualisation of performance analysis as an integrated decision support function within modern football organisations.

The findings of this study highlight several opportunities for future research within football performance analysis. One important area for further investigation concerns differences in technological workflows across competitive levels. Previous research has shown that technological adoption within sport performance environments can vary considerably depending on organisational resources and competitive context (Barris & Button, 2008). Future studies may therefore examine how analytical technologies, staffing structures, and workflows differ between elite professional clubs, semi-professional teams, and lower-tier organisations. Linking to this, further research into the workflows and perspectives of multidisciplinary staff such as coaches, sport scientists, scouts, recruiters, and players could be beneficial to provide contemporary insights on various sporting departments and how such disciplines collaborate and the efficacy of such collaboration with the analysis department via interdisciplinary practice. As football organisations increasingly integrate sport science, medical, and data-driven approaches into performance preparation, understanding how analysts collaborate across disciplines may provide valuable insight into the development of integrated performance support systems (Andersen et al., 2022).

The growing influence of artificial intelligence and automated analysis technologies also represents an important area for future investigation. Emerging technologies capable of automating video coding, pattern recognition, and data processing may significantly influence how analysts interact with performance data. Understanding how such technologies reshape analytical workflows and decision-making processes will be important as football continues to adopt more advanced data-driven approaches to performance analysis (Linke et al., 2020).

Finally, qualitative research involving interviews, ethnographic observation, or case studies may provide deeper insight into the lived experiences of performance analysts working within football environments. Such approaches have previously been recommended to better understand the social and organisational dynamics influencing applied sport practice (Smith & Sparkes, 2012).

8. CONCLUSION

This study provides contemporary insight into the technological processes, workflows, and professional experiences of performance analysts working within football. Findings indicate that analysis remains centred on video-based workflows, with opposition, match, and individual analysis forming core responsibilities. Despite

advances in automated and tracking technologies, traditional approaches such as manual video capture and notational analysis remain widely used. Education pathways, particularly undergraduate and postgraduate qualifications, appear important for entry into the profession alongside applied experience. While analysts typically prepare outputs, coaches remain the primary presenters of analysis, although analyst involvement increases in smaller group and individual contexts. The findings highlight widespread multidisciplinary collaboration, though this does not always result in fully integrated interdisciplinary practice. Future developments are expected to focus on artificial intelligence, automation, and data integration, shifting the role towards greater emphasis on interpretation and communication. Ultimately, understanding how analysts integrate technology, expertise, and collaboration within football environments will be essential for ensuring that performance analysis continues to support effective decision-making and performance development in the modern game.

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Transparency: The authors state that the manuscript is honest, truthful, and transparent, that no key aspects of the investigation have been omitted, and that any differences from the study as planned have been clarified. This study followed all writing ethics.

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