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An Exploratory Study in to the Development of a Multidisciplinary Team in Elite Level Cricket: A Thematic Analysis

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Abstract:

Objective: *To establish if consistent concepts exist amongst sports medicine professionals working within elite cricket when developing a multi-disciplinary performance team.*

Design: *An exploratory research design was adopted and the findings were coded using a thematic analysis approach.*

Method: *6 semi structured interviews were conducted: England and Wales Cricket Board (n=3) Board of Control for Cricket in India (n=3). Each board comprised of Head of Physiotherapy, Head of Strength and Conditioning Coach and Head Coach. Data sets were analysed utilising thematic analysis.*

Results: *Thematic analysis generated 226 codes, 9 sub-themes and 3 main overarching themes. Each theme was defined. The main themes were: 'communication', 'performance parameter' and 'structure and governance'.*

Conclusion: *Communication is key to collaborative work within a multidisciplinary team. However, several other factors must be considered when developing an MDT, which include innovation and strong structural, philosophical, strategical and governance policies to enhance team performance.*

Keywords: *'Multidisciplinary team', 'inter-disciplinary', 'inter-professional', 'sports medicine', 'coaches', 'athletic trainer'*

Abbreviations: *MDT: Multidisciplinary team, n: Number of participants, P: Participants, S&C: Strength and conditioning coach, CPD: Continuing professional Upgradation, GPS: Global positioning System, RPE: Rate of perceived exertion, CEO: Chief Executive Officer*

1. INTRODUCTION

A multidisciplinary team (MDT) consists of professionals from various disciplines who work collaboratively to provide best care to an athlete (Breitbach et al 2017; Fleissig et al, 2006). High performance sports medicine is a domain that deals with individuals who are distinct and intricate compared to the general population in relation to their physiological, psychological and behavioral characteristics (Speed & Roberts, 2011; Speed & Ingham, 2011; Speed & Jacques, 2011).

Moreover, sports performance is multifactorial and is often based on fatigue avoidance, recovery status, individual differences, injury, training history, social lives, health and mental well-being (Sporer & Windt, 2017; Maffulli, 2011). Owing to the complexity of performance, athletes are often surrounded by an interdisciplinary team of professionals presenting a range of specialties, which can vary across teams competing at the same level. The MDT team members involved in athletic care may include: sports physicians,

physiotherapists, nutritionists, osteopaths, chiropractors, massage therapists, biomechanists, physiologists, psychologists or strength and conditioning coaches (S+C). These team members often work in conjunction with coaching staff (technical coaches and tactical coach) to manage athletes' well-being and performance (Sporer & Windt, 2017; Gilmore, 2017; Dijkstra et al., 2014). According to Cullen and Batt (2005) the strength of a MDT lies in a wide gamut of its specialties. However, in reality evidence exists that suggest that sub division exist within MDT's and they often work in isolated departments ultimately hampering team dynamics and managing the whole athlete (Fletcher et al, 2017).

Due to the commercialisation of cricket, teams around the world use a multidisciplinary approach to provide a competitive edge (Ashton, 2016). As small as a 1% change could make the difference between a potential success or failure (Sporer & Windt, 2017; Gabbett, 2016). Most of the teams use a structured and evidence based approach to monitor athletes, to make them more robust and resilient through appropriate training measures that may help to reduce or prevent injuries with the ultimate goal of enhancing the performance of an athlete (Bourdon et al., 2017; Foster et al, 2017; Sanders et al., 2017; Gabbett, 2016). In order to facilitate better decision making and positive physical outcomes for an athlete and team, it is vital for each member of the MDT to have mutual co-operation, effective communication, enhanced understanding and integration amongst each other (Sporer & Windt, 2017; Fletcher et al., 2017; Dijkstra et al., 2014). In contrast, within a heterogeneous MDT, if the role of each member is not clearly demarcated this may lead to overlap and impede professional relationships.

The Head of Sports Medicine usually coordinates the management of injury and illness within a team and structures appropriate screening and analysis of functional or biomechanical parameters to reduce the risk of injury (Dijkstra et al., 2014; Djikstra & Pollock, 2014). The Head of Coaching manages all Technical as well as the S&C coaches. Coaches have knowledge about athletes' values, sports specific preferences and training routines to enhance the performance (Ashton, 2016; Dijkstra et al., 2014; Djikstra & Pollock, 2014). Moreover, both the departments need to work in synergy towards a specific performance goal (Breitbach et al, 2017; Hankemeier & Manspeaker, 2017; Speed & Jacques, 2011; Speed & Roberts, 2011). There have been however some discrepancies in MDT dynamics within sport settings because of organisational challenges, interdisciplinary conflicts and employment insecurities (Malcolm & Scott, 2013). Additionally, the high stakes, the onus to have a competitive edge, and the emphasis on winning, have fractured the modern sports culture resulting in disparity and separation of medical staff and coaching staff within the same team (Gilmore et al., 2017; Ashton, 2016; Dijkstra et al., 2014).

In sports settings there are established hierarchies based around teamwork. Therefore, communication is vital in a MDT as it facilitates better team bonding and accountability by having clear purpose, well defined roles and organisational policies (Breibatch et al., 2017; Hankemeier & Manspeaker, 2017). This could be achieved by regularly conducting team meetings and communication policies that allow facilitation of seamless transfer of information to address athletes' health and performance issues (Reeves, 2012). To improve the standard and quality of care, each member of a MDT needs to work in unison and share decisions by keeping athletes' requirements at the center. Furthermore, the MDT needs to be driven by a strong cultural philosophy where no individual is more important than whole, and each member depends on another to successfully perform their role (Roncagila, 2016). Conversely, according to Gabbett et al. (2017) owing to diversity in MDTs; issues such as interdisciplinary conflicts and personal differences may impede regular communication.

According to Speed and Roberts (2011) operational strategies consist of skills integration, outsourcing expert panel to enhance the knowledge base, practice reflection, clinical audits and continuing education for professional upgradation to provide best quality care to athlete. Evidence based medicine practice have become more prevalent to ensure safe and effective treatment (Manske & Lehecka, 2012). On the other hand, preference based medicine enables athletes-centered care as well as treatment in the wake of realistic assessment of risks and benefits (Chow et al, 2013). Reducing the gap between the two systems of practices enables a sports medicine practitioner to analyse, synthesise, appraise critical medical evidence and communicate it to the athlete

(Dijkstra et al., 2014). The aim of the current study therefore was to examine the function of MDT's in elite level cricket and understand what factors influence their development and effective maintenance, ensuring a collaborative approach to managing the athlete.

2. MATERIALS AND METHOD

An exploratory research design was adopted; using interviews for data generation and thematic analysis approach for coding data. To explore the functioning of MDTs in elite level cricket was the primary aim of the study design through detailed and comprehensive information from both concurrent and discordant perspectives. This study is underpinned by a constructivism world view: that meaning and experience are influenced by social factors, rather than being inherent in individuals (Smith, 2018). Perceptions of a MDT working are personal and based on subjective experience, so interpretivism is the most relevant epistemology (Cavallerio, Wadey, & Wagstaff, 2016). Deductive (theoretical) analysis was used as this study is intended to explore various determinants of a MDT in-depth, to provide insights and to offer future recommendations. From the given data set, 'top down' themes were developed (Braun & Clark, 2006). Themes were generated using a latent approach that was informed by the current evidence base (Braun & Clark, 2006).

2.1. Participants

Following ethical approval from the host universities ethical committee, participants were contacted through existing professional links via email. A participant information sheet provided the rationale of the study, and participants contacted the researcher if they wished to take part. The sample consisted of 6 participants (n=3 from England and Wales Cricket Board and n=3 from Board of Control for Cricket in India). Each board included Head of Physiotherapy (n=1), Head of S&C (n=1) and Head Coach (n=1): these form the basis of a MDT in cricket (Gabbett et al., 2017). All participants had worked in elite level cricket in the United Kingdom and India. There is no set guide for the number of participants in thematic analysis and according to Braun and Clarke (2006) it should be based on requirement of the study. Alternatively, Eathough and Smith (2007) argue that at least 6 participants are appropriate. Conversely, Bird (2005) states 8-10 participants. Purposive selection go participants is more highly relevant to answer this research question, so a sample size of 6 participants was considered appropriate to provide a sufficient range of participants beliefs, perception and experiences.

2.2. Data collection

Prior to interview, all the participants provided informed consent and briefed about their right to withdraw, data anonymity and confidentiality. A semi-structured interview (appendix 2) was conducted with each participant, which consisted of open ended questions that moved back and forth through the topic based on responses. The questions were validated by subject experts before the start of the study. Interviews were conducted face-to-face for the UK based participants at a place and time comfortable for them. Additionally, 3 other participants from India were interviewed using Skype video calls which were audio recoded. Data generated through these interviews were stored in university's encrypted network. Data obtained were transcribed in form of hand written notes (appendix 3). The average duration of each interview was 30 minutes.

2.3. Data Analysis

This study followed the process of thematic analysis (appendix 4) recommended by Braun et al. (2016). The interviews were transcribed and initial ideas were noted down in the process of reading and re-reading (familiarisation) of data. Themes were identified through a content analysis and systematically coded. All codes were grouped to form potential sub-themes and main overarching themes, generating thematic analysis map. All codes were colour coded for identification and codes were verified by another researcher.

3. RESULTS

The result from the interviews of the 6 participants generated 226 codes. The 9 sub-themes and 3 main overarching themes are shown in table 1. To demonstrate the transparency of the descriptive coding, participants' own words were included in the presentation of the themes, marked as P1-P6 to indicate individual participants. The 3 main themes (communication, performance parameters, structure and governance) that reflect factors which appear to influence the development and maintenance of high performing MDTs in elite cricket are shown in Figure. 1.

Table1. *Coding of sub-themes and main themes of effective MDT in cricket*

Sr. No.	Sub-theme	Main Theme
1	Team Dynamics	1.Communication
2	Common Philosophy	
3	Analytics	2.Performance Parameters
4	Training Programmes	
5	Professional Upgradation Plans	
6	Latest Technology	
7	Screening, Testing and Monitoring	
8	Roles and Responsibilities of Members of the MDT	3.Structure and Governance
9	Interdisciplinary Team Structure	

Communication is referred to as a process where a message is received and understood, keeping members of the MDT informed about the organisations philosophy and goals, expectations and evaluation of performance (Taylor, Doherty, & Mc Graw, 2015). This theme includes two sub-themes- team dynamics and common philosophy.

All participants responded that for good team dynamics it is vital to communicate and meet regularly to improve decision making process, to have accountability and foster good working relationship.

Interviewer: What is your opinion on team meetings?

"… It helps to have clear cut goals, everyone is aware what would be the permutation and combination of players…have job profile for each and everyone…help us to arrive at decision…" (P1)

"…if there is no team meeting there is no decision making…if you do not communicate you have 5-6 individuals working individually… "(P6, 1233)

In contrast, one of the participant felt that team meetings adds different perspectives.

"…for one injury there are various factors…meetings gives various perspectives my view would be from medical point, but the psychologist might come from different angle and might say things which might have been missed off…so it gives clear management plan…." (P2, 264-272).

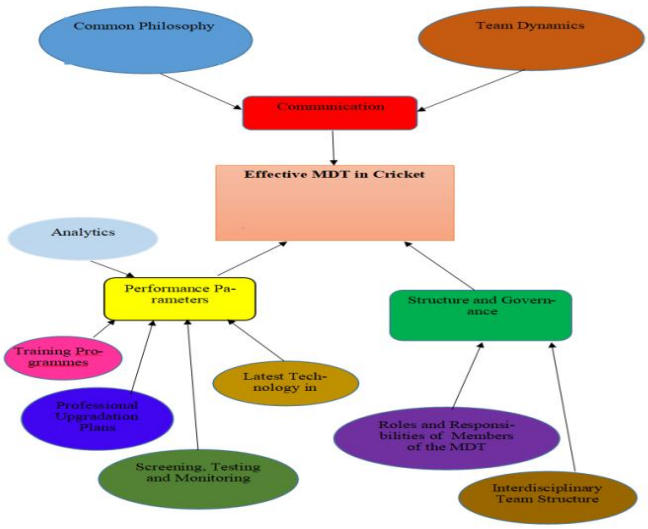

Figure1. *Thematic Map*

How do you manage your MDT dynamics?

MDTs in sports require a strong common philosophy that binds each individual with a common purpose. Most of the participants told that they work as a team to reduce injuries, maximize players' availability and enhance performance. Two participants had differing views:

"Fully resource every player and team with right balance across all the disciplines to achieve his true potential and goals." (P5).

"We aim to do basics well make sure they are all covered before anything fancy comes along and communicate well." (P6)

Performance parameters is defined as a process of integration of best practices such as analytics, training programme, latest technology, education, regular screening, monitoring and testing to improve athlete centered cared and boost performance (Balsom, 2017; Mazerolle et al., 2012). This theme is represented by a wide spectrum of five sub-themes. These include: analytics, training programmes, professional up gradation plans, latest technology, and screening, monitoring and testing. Analytics provide more statistical information that helps to measure a skill based performance more objectively. Two participants presented similar views on analytics in cricket.

"….all the statistics and visuals could be used for analysis. Statistics give information regarding standard of performance and visuals give more information on standard of technique how he has improved…" (P1, 9)

"…if someone is playing well I might look at some other things that result in his performance. How many dot balls he faced, how does he rotate strike and that can be the example for the others to try and achieve who have not been successful…it forms a benchmark for others to follow…." (P5).

In the second sub-theme, training programmes, all participants felt that training needs to be individualised, as every player is different, their positional demand varies, have different injury history and physical requirements.

Three participants however felt that fitness is multifactorial and is dependent on various factors, age being just one the factors. Others felt in team sports group training has a place and could be done differently keeping individual needs in mind.

"….there are ways you can have a group of players and still you can individualise programme where you have common movement categories but can do variation in exercises based on their requirements and needs which is easier logistically to manage…." (P4)

In the third sub-theme, professional upgradation plans, all the participants engaged themselves in professional upgradation activities by interacting with professional experts, reading articles, abstracts, books, current literatures, attending seminars, workshops, online courses, continuing professional development (CPD) modules, using social media and blogs. All participants felt it is vital as cricket is evolving; they have to keep knowledge updated to provide best care to athlete. Two participants felt however that owing to busy schedule it is difficult to upgrade regularly. It depends where you work and available resources.

"….felt that it is not done enough in cricket. There is no time, no funding. Sometimes good courses fall during season and coaches won't allow you to go…"(P2).

"(P3) conveyed that it is difficult to upgrade ourselves…as we are always with the team and travelling…it is difficult to find the course"

The fourth sub-theme; screening, monitoring and testing; all the participants routinely performed screening, monitoring and testing. This consisted of musculoskeletal, biomechanical, physiological, psychological and technical screening to determine players' strength and weakness, to give normative data and baseline measure that helps in monitoring progress of each player and to plan subsequent prehab intervention, nutritional updates and player welfare profile. In spite of the frequency, duration of testing and monitoring the use of data to enhance physical performance varied amongst participants.

"… feels that we do lot of testing and we do not do anything with that. It is really very important that players' understand what you are doing and they how you can use that to impact their performance…" (P2).

"…reliability of screening towards training designing is questionable, but if we can devise the movements that are dynamic inclusive of skills and exercise then its utility increases…not all the tests are validated or reliable…with regards to standing in scientific literature to still

debatable and anecdotal. But, in practical use screening still has its place…. (P4)".

In the fifth sub-theme, latest technology; all the participants used latest technologies for storage of information, transfer of data and technical analysis to improve performance. Various software such as 22 yards, heat maps, bowl trackers, first link, cricket squad, smarta base, and treatment lapse, are used. On the contrary, few participants still use excel sheets, word document and google drives to share and store data. Moreover, 5 participants felt that there is still a need to choose optimal technology based approaches that meets the teams need and requirements at the same time maximises the utilization of available resources that may positively influence players' performance.

"…. always better to use technology but we should not overdo it. It should be used sensibly I feel so many players get so much addicted to software and technology we say "paralysis by analysis"…. (P1).

"…..thinks that a lot of things are out there but its about picking right unit and gadget that is going to benefit you, your players, your club and their professional levels; the coaches and players understanding what you gonna….. It is an education process….." (P2).

"……feels that it is up to the coach to decide what is clutter and what is useful. If you use everything that the salesman brings you, your day will be full with gadgets and gizmos…just get in your way 1 or 2 things that are important and valued and player can focus on, rather than using just for sake of it…." (P5).

Structure and governance is defined as a process of coordinating and functioning amongst different members of MDT to allow them to work together within organisational framework and policies (Lam, 2014; Geeraert, 2013). This overarching theme is composed of two sub-themes i.e. roles and responsibilities of each member and interdisciplinary team structure. Three participants felt that clear roles and responsibilities helped MDT environment whereas others felt that there is no great amount of overlap.

Interviewer: How clear roles and responsibilities help or hinder the MDT environment?

"…..I think it helps because you know who is doing what and what it is…. sometimes it can hinder because people think I don't want to cross the boundary line. Sometimes when people do cross the line they challenge other people in their area, but I think challenge is important because it challenges you to get better, challenges you to think about your roles rather than keeping you in boxes…..(P2)".

"….. thinks it very difficult to have clear cut roles and responsibilities. Sometimes there is an overlap but that depends on your relationship and rapport with MDT. It is a very grey area, this is reason why MDT needs to be open, trustworthy and truthful to their job…" (P3).

In contrast,

"… are of opinion that " there is no great amount of overlap really…medical staff and S&C coaches is what it is….physio is what it is…coaches all have their own particular role…" (P5).

In the sub-theme titled 'interdisciplinary team structure', most of participants had similar MDT structure which consisted of team doctor, Physiotherapist, S&C, video analyst, a masseur, psychologist, nutritionist, head coach, technical coaches (batting, bowling, fielding) and manager**.**

P2, P5, P6 ….additionally had Player welfare officer, CEO, Sports Therapist.

4. DISCUSSION

The aim of the current study is to examine the function for MDT's in elite level cricket and understand what factors influence their development and effective maintenance, ensuring a collaborative approach managing the athlete. Completion of the thematic analysis identified three emergent themes which are to be discussed: 1) Communication 2) Performance parameters 3) Structure and governance.

Communication is vital to function as a team, it helps to resolve disagreement and improves team cohesiveness (Gabbett et al., 2017). Findings in the present study are consistent with previous research in other sports. Highlighting, that communication within MDT's provides multiple perspectives from a range of practitioners to develop a better understanding of potential differential diagnosis and signs and symptoms of the condition, which one professional may have missed (Fitzerland & Davison, 2008; Hall, 2005). Due to the multifaceted nature in diagnosing and managing injury for optimal return of the athlete, consideration must be given to physical,

psychological and psychosocial factors that can all influence their safe and effective return (Pabian et al, 2016). Competitiveness and overriding philosophy of the team in elite sports settings demands that MDTs work as an extended athletic family (Hankemeier & Manspeaker, 2017). In contrast, issues such as status imbalance, professional dominance, comprise and competition may act as potential barriers for communication in elite teams (Breitbach et al, 2017). This could be countered by having set communication policies, mutual trust, shared goals and understanding of potential strength and weakness of each individual that has been explored in this study that enables MDTs to provide safe and effective care to players (Hall, 2005).

Most elite sports teams continuously strive for ways to enhance performance that maximises the potential for success. MDTs use various performance parameters that are valid, reliable and practically feasible (Bourdon et al., 2017; Foster et al., 2017; Sanders et al., 2017). Evans et al (2017) indicate that only 30% of a performance carried from a team is recalled by coaches and players, which resulted into smaller gains. Thus, the role of the analysts are to report on the 70% that was missed. This will provide vital feedback to the players and MDT. The findings from the aforementioned work provides more insight on usage of statistics and visuals to enhance performance of an athlete. Although, without clear and efficient communication this analytical approach would be wasted.

It is essential that any MDT must review evidence based practice and identify key professional training to remain current practitioners, as the game of cricket is constantly evolving. Owing to professionalism, modern day players' requirements are different. Hence, professionals need to equip themselves with best available knowledge and resources that allow them to bridge a gap between evidence based practice and preference based practice with the intent to maximise athletes' performance (Balsom, 2017; Mazerolle et al., 2012). Findings from the present study suggest that this is not regularly completed by MDT's in Indian cricket. This was mainly attributed to a busy schedule, with practitioners detailing that this could only be completed effectively before the start of season or through engagement in other methods such as; clinical reflection, clinical audit, webinar, or professional groups. Modern day cricket utilises various monitoring, screening, testing and technology to maintain up to date records. These records include injury /illness data, training design, rehabilitation profiles/programming, conditioning profiles/ programming, recovery strategy plans and return to play outcome measures (Bourdon et al., 2017; Foster et al., 2017; Sanders et al., 2017; Gabbett, 2016). Representing another method of effective communication between the MDT.

Various injury databases are utilised to store and share player's data. This promotes collaboration of the MDT facilitating them to work in an integrated manner, provide different perspectives, seamlessly transfer information and perform clinical audits. Allowing them to review and reflect on their practices as a performance department (Gabbett et al., 2017; Dijkstra et al., 2014; Speed & Robert, 2011). Careful consideration must be given to the use of every monitoring tool and its limitations. It is the responsibility of the MDT to determine whether they are appropriate to facilitate key decisions surrounding the athlete and performance of the team (Bourdon et al., 2017). Results displayed in the current paper suggests that the quality and relevance of measures taken from athletes is more appropriate than the quantity of data collected. It is vital to have meaningful data to positively influence clinical practice and performance. Such data needs to be used in combination with other parameters and not in isolation (Foster et al., 2017). Sports injuries and performance are multifactorial so MDTs need to consider all the biopsychosocial parameters (Foster et al., 2017; Bourdon et al., 2017; Gabbett, 2016). There is no single definitive tool to predict performance. Therefore, a balanced decision making process within MDT, driven by the utilisation of key performance parameters is needed to improve scientific legitimacy to monitor, screen and test athletes to maximise performance and reduce injury risk (Foster et al., 2017; Sanders et al., 2017).

Owing to recent commercialisation and professionalism in elite cricket, the type of decisions that need to take are more complex, high profile, commercial and multidisciplinary in nature (Ashton, 2016). Therefore, to address these issues and shape an organisation, good structure and governance is vital (Ingram & O'Boyle, 2018; Crawford & Carter, 2011). According to Bitel and Carr (2016), the essence of good governance is based on: a clear and set

structure led by a board that is responsible for the long term success of that organisation. It also needs promotion of internal democracy by effectively engaging professionals and making them more accountable, as well as to abide by the standards of conduct and engaging in regular and effective monitoring of improvements. Finally, it also requires compliance with all the policies and process laid down by the organisation. Findings within the present study emphasise that it is essential to have structural and organisational policies. This aids identification of overall team strategy to achieve pre-determined outcomes for success, individual team member roles and strategy for successful management of the organisation. The culture of sport may be a potential barrier to adapt and implement a structured governance code; however, failure to complete and challenge current culture may be detrimental to team performance. A lack of professionalisation by other professionals within the organisations may decrease growth and progress. Although, this could be countered by encouraging internal democracy and openness in sporting teams (Lam, 2014). Effective governance is complex in sports but it could be reinforced by incorporating robust institutional policies, codes of conduct, structure, rules and dispute mechanisms. Without successful integration of this the performance of the team may be negatively affected (European Olympic Committee, 2003).

LIMITATIONS

The main limitation of this study is attributed to the relatively small sample size, restricting generalisation to other countries practices. Only one interview per participant was conducted for this study, where iterative interviews may potentially have provided more in-depth exploration of each theme. This study is limited to analysis of the function of an MDT in elite cricket in England and India. Consideration must be given to the structure and organisational framework in other nations and sports, as this may vary considerably. The current body of workprovides an insight in to the collaborative work of theMDT in elite cricket andmay provide insight to other teams in to factors required for consideration when developing an elite performance department.

5. CONCLUSION

Owing to commercialisation, globalisation and professionalism in cricket, every team wants to have a competitive edge over other teams or nations. Therefore, many teams employ a MDT approach to meet this demand. Most of the sports organisations believe that the secret of developing a winning team lies in the quality of the MDT. To develop an effective MDT, it is vital to foster independence amongst members. This could be achieved by three key factors: communication that allows collective decision making and shared responsibilities; adapting various performance parameters that could lead to ‘best practices’ to produce positive outcomes; resilient structure and governing organisational frameworks that would instill greater transparency and integrity.

Practical Implications

- Identification of key areas (communication, performance parameters and structure and governance) that are important to improve efficacy and efficiency of MDTs in elite cricket.
- Better understanding of various aspects of team dynamics that may help to inform future structure and governance policies to make MDTs more accountable, sustainable and robust.
- Identification of the extent of usage of recent trends in sports and inter-professional practices to enhance performance.

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