

## 2026 ICM Problem D: Managing Sports for Success

2026 ICM 题目 D: 体育运营管理与成功

“The player’s job is to help his team win.”- Cliff Blau, baseball historian and statistician “The player’s job is to make money for the owner.”- all sports team owners

“球员的工作是帮助球队赢球。”——棒球史学家兼统计学家 Cliff Blau; “球员的工作是为老板赚钱。”——所有职业体育俱乐部老板

Fans tend to focus on the players on the field or court, but that is only the tip of the sports business iceberg. Sports are entertainment first and foremost. Entertainment is a profit-generating business and the players are hired mostly for that purpose. Often, fans of spectator sports ignore the financial purpose of a sport and try to focus on the game itself and its participants. However, in professional sports business, the primary goal is to make money for the owner and not necessarily win games. While these two goals may be related, since winning generates more interest in the team, other factors are involved. And for some sports teams, there are crucial moments when opportunity and risk are both high –like this year’s situation for teams in the Women’s National Basketball Association (WNBA), the most prominent women’s professional basketball league in the United States. For many reasons (especially higher fan interest), WNBA teams are hoping to evolve from risky startup businesses into major entertainment enterprises by taking advantage of increased media attention, new team franchises, larger venues, and a new digital platform to increase revenue. The owners in that league need to use sports analytics to succeed on the court but also use financial modeling to achieve significant financial gain in the bottom line of their business’s profit sheet.

球迷往往把注意力集中在场上球员身上，但这只是体育商业冰山一角。体育首先是一种娱乐。娱乐是创造利润的生意，球员的雇佣在很大程度上就是为此服务。观赛体育的粉丝常常忽视体育项目的财务目的，而试图只关注比赛本身及其参与者。然而，在职业体育商业中，首要目标是为老板赚钱，而不一定是赢球。尽管这两个目标可能相关（因为赢球会带来更多关注），但其中还涉及其他因素。对某些球队而言，还会出现“机会与风险都很高”的关键时刻——例如今年美国最具影响力的女子职业篮球联赛——女子国家篮球协会（WNBA）的多支球队所处的局面。由于多种原因（尤其是球迷兴趣提升），WNBA 球队希望借助更高的媒体关注度、新增球队特许经营、更大的比赛场馆以及新的数字平台来提高收入，从而将高风险的“初创型”业务转变为大型娱乐企业。该联盟的球队所有者既需要利用体育数据分析在赛场上取得成功，也需要运用财务建模在企业利润表的最终收益上实现显著提升。

Should players (and other employees of the team business) in a sport get paid more for their performance that produces wins or for their contributions in turning a profit for the team owner? Sometimes, a player’s sport performance is directly related to profit, but not always. Some players may attract fans based more on popularity than performance. These players may generate ticket, parking, concession, and jersey revenue much more than players with higher levels of performance. Financial and sports analytics models need to connect to create good team decision making.

在一项运动中，球员（以及球队企业的其他雇员）应当因为带来胜利的赛场表现而获得更高薪酬，还是因为为球队老板创造利润的贡献而获得更高薪酬？有时，球员的竞技表现与利润直接相关，但并非总是如此。有些球员吸引球迷更多依靠人气而非表现；他们带来的门票、停车、餐饮（特许经营）以及球衣等周边收入，可能远超表现更出色的球员。要做出良好的球队决策，财务分析模型与体育数据分析模型需要彼此衔接、相互支撑。

In the emerging field of sports analytics with various kinds and amounts of performance data, there continue to be challenges to build statistics that quantify the value of player talents and performances (what statistic to measure, how to measure it, when to measure it). Some players are injured more frequently than others. How does that affect player value? Some have personalities that lead to more popularity and appeal that lead to financial gain. Context and timing matter in the sense that some players, even those with average performance, come through at important moments of the game or critical times in the season. There is a temporal element that must consider the measure of future potential of a player/employee on achieving the goal of the team. Some roles may be performance or skill-based and other roles are accomplished more by hard work and perseverance.

在体育数据分析这一新兴领域中，虽然已有多种类型、不同规模的表现数据，但要构建能够量化球员天赋与表现价值的统计指标仍面临诸多挑战（该衡量什么指标、如何衡量、何时衡量）。有些球员受伤更频繁，这会如何影响其价值？有些球员因性格特质而更具人气与吸引力，从而带来财务收益。从“语境与时点”的角度看，即便是表现中等的球员，

也可能在比赛关键时刻或赛季关键阶段挺身而出。模型还需要考虑时间维度：衡量球员/雇员未来潜力对实现球队目标的作用。有些岗位更依赖表现或技能，而另一些岗位更多依靠勤奋与坚持来完成。

The player or team perceptions, popularity, timing, and marketing can play major roles, in addition to the location of the team. Teams in large markets often have different sports situations and goals than small-market teams. Those differences impact how owners achieve profit and recruit their players and employees. Can modeling help an owner establish methodologies for setting offers, negotiating, and writing contracts?

除球队所处地理位置外，外界对球员或球队的认知、人气、时机与营销也可能发挥重要作用。大市场球队的体育环境与目标往往不同于小市场球队；这些差异会影响老板如何实现盈利，以及如何招募球员和雇员。建模能否帮助球队所有者建立一套用于报价、谈判与拟定合同的系统方法？

There are many team issues that are strictly or mostly financial, just as there are issues that are mostly sports. In many cases, professional sports teams are franchises that are part of the league enterprise and often operate with additional rules and constraints set by leagues or governments on their player salaries and contracts. These are intended to make the game competition fair with some reasonable amount of competitive balance. Some professional sports have systems that regulate salaries with caps or taxes. Every season, the owner must decide how much to finance with debt versus equity and whether risks in the form of seeking better team performance with associated additional costs are worth taking. In the sports business world, conditions such as revenues, salaries, injuries, trade opportunities, taxes, fees, and interest rates change over time. Sports teams are now seen as premium assets, with values in many sports soaring far beyond historical norms due to financial and market factors such as lucrative media deals and accumulation of vast data streams and intellectual property.

球队面临的议题中，有许多完全或主要属于财务范畴，正如也有许多议题主要属于竞技体育范畴。在很多情况下，职业体育球队是联盟企业的一部分（特许经营），其运营往往还受到联盟或政府在球员薪资与合同方面制定的额外规则与约束。这些规则旨在让竞赛更公平，并保持一定程度的竞争均衡。有些职业体育项目通过工资帽或奢侈税等制度来调节薪资水平。每个赛季，老板都必须决定以负债融资还是权益融资为主，并判断为了追求更好的球队表现而承担相应的额外成本与风险是否值得。在体育商业世界中，收入、薪资、伤病、交易机会、税费与利率等条件会随时间变化。如今体育球队被视为优质资产；在不少项目中，由于高额媒体合同、海量数据流与知识产权的积累等财务与市场因素，球队估值已远超历史常态。

As a modeling group for a sports team, your ICM team can use publicly available sport and finance data for a team of your choice (the team you select must consist of at least 5 players that play cooperatively at the same time and be a member of a professional league) and build a business and management model for the team for the coming or next season.

作为某支职业运动队的建模团队，你们的 ICM 小组可以选取一支球队，并使用公开可得的体育与财务数据（所选球队必须来自职业联盟，且至少包含 5 名可同时协同上场比赛的球员），为该队即将到来或下一赛季建立一套商业与管理模型。

As was mentioned earlier as an example of how this modeling work can be extremely valuable, the WNBA is undergoing significant financial changes –record viewership, rising franchise values, and significant player benefit expectations. Currently, negotiations and demands over the revenue-sharing agreement between teams and players are sticking points. During this coming season, team owners have an opportunity to remake and improve their business or succumb to risks that may cause them to sell or take on substantial debt. These issues create a situation where solid financial and sport modeling can make a big difference for the current and future owners of these teams. You may use a WNBA team if you care to, but you are not required to do that.

如前所述，WNBA 可以作为一个体现此类建模工作价值的典型例子：该联盟正在经历显著的财务变化——收视创纪录、特许经营球队估值上升，以及球员福利期望显著提高。目前，球队与球员之间关于收入分成协议的谈判与诉求是主要的僵持点。在即将到来的赛季里，球队所有者有机会重塑并改善其业务；也可能在风险压力下被迫出售球队或承担大量债务。这些问题使得扎实的财务与竞技建模能够对这些球队现任与未来所有者产生重大影响。你可以选择 WNBA 球队作为研究对象，但并非必须。

## Questions to consider:

### 思考问题:

Design a dynamic decision-making model that would help your team owner and general managers adjust their leverage in response to changing team performance and economic conditions. The goal is to maximize team profit and value while managing team structure and performance. The model should include priorities and actions for the management teams in both business operations and team operations, and account for systems that will help the owner make decisions through the coming season and beyond.

设计一个动态决策模型，帮助球队所有者与总经理在球队表现与经济条件变化时调整其“杠杆/议价能力”。目标是在管理球队结构与竞技表现的同时，实现球队利润与价值的最大化。模型应同时包含商业运营与球队运营两方面管理团队的优先级与行动方案，并纳入能够支撑老板在即将到来的赛季及更长周期内持续决策的机制与系统。

Based on the needs of the team and your model, develop a strategy to acquire players for next season using the standard practice for your team's league such as a draft, free agency, trades, transfer fees, or other standard practices. You may want to consider how to value a player or the

基于球队需求以及你的模型，使用该联盟的常见做法（例如选秀、自由球员签约、交易、转会费或其他标准机制）制定下一赛季的引援/补强策略。你可能需要考虑如何对球员进行估值，或如何衡量

team dynamics in terms of the profit for the team owners. Using the outcomes of your model, discuss the strengths and weaknesses of your strategy on the business.

球队内部动态对球队所有者利润的影响。基于模型输出，讨论你的策略在商业层面的优势与劣势。

There are many league-determined rulings that impact how a single team can operate, such as salary caps, number of players on a roster, schedule (number, order, location, and date of games in a season, so consequently days of rest), media contracts and rights, revenue distributions, and others. If a league is expanding the number of franchises (such as for WNBA), it is likely to impact all teams in the league. Use your model to decide how your team's strategy should change from your initial strategy during a season with league expansion. How does the location for the new team impact your model and resulting strategy? Be clear on the impact on the team owners and locations for the new team that would be particularly harmful or beneficial under an expansion.

许多由联盟制定的规则会影响单支球队的运营方式，例如：工资帽、阵容名单人数、赛程安排（赛季比赛的数量、顺序、地点与日期，从而影响休息天数）、媒体合同与转播权、收入分配等。若联盟正在扩充特许经营球队数量（如WNBA），很可能会影响联盟内所有球队。请使用你的模型决定：在联盟扩军赛季，你的球队策略应如何在原有策略基础上调整。新球队所在地将如何影响你的模型与由此得出的策略？请明确扩军对球队所有者的影响，并指出在扩军情形下哪些新球队选址会特别有害或特别有利。

Consider one additional business decision and use your model to design the best strategy for your team. Some examples include but are not limited to:

再考虑一个额外的商业决策，并用你的模型为球队设计最佳策略。示例包括但不限于：

- Ticket sales vary greatly by the size of the stadium, time of year, popularity of the team (yours and opponent), size of the team's market, and other factors. A team may choose to maximize ticket sale revenue for each game or lower the prices to have larger attendance with the possibility to convert some of those attendees into season ticket holders. How do you determine the optimal ticket pricing strategy over a season?

门票销售会随场馆规模、季节时点、球队（己方与对手）受欢迎程度、球队市场规模等因素大幅波动。球队可以选择在每场比赛中尽可能提高门票收入，也可以通过降价提升上座率，并期望将其中一部分观众转化为季票持有者。你将如何确定一个赛季内的最优票价策略？

- The venue for the team to play its games may be rented or owned with the need to maintain, renovate, or even build a new venue. How do you balance the long-term cost of the venue when it is a short-term decision?

球队比赛场馆可能是租赁或自有资产，并可能需要维护、翻新，甚至新建。面对短期决策，你如何权衡场馆的长期成本？

- Player equity in ownership can be one strategy for subsidizing large salaries, such as revenue sharing (single season), profit participation (bonus), decision makers (as part of unions or collective bargaining), long-term equity stake (part owner), or other methods. Player equity options need to be sufficiently lucrative for a player to accept it, but not undermine the future funding options. How do you determine which players, if any, are offered equity and how much?

向球员提供所有权权益可作为补贴高薪的一种策略，例如：单赛季收入分成、利润分成（奖金）、参与决策（工会或集体谈判的一部分）、长期股权（成为部分所有者）等。权益方案需要足够吸引球员接受，同时又不能削弱球队未来融资空间。你将如何决定是否提供股权、提供给哪些球员以及提供多少？

- Media deals are a large source of revenue, fan engagement, and brand building, often producing high engagement and advertising potential. While leagues usually contract national deals, teams can sometimes broker their own local deals or streaming options. Does your team need to improve or change its media presence?

媒体合作是重要的收入来源，也能带来球迷互动与品牌建设，通常具有高参与度与广告潜力。尽管联盟通常会签订全国性转播合同，球队有时也能达成本地合作或流媒体方案。你的球队是否需要改善或调整其媒体布局与曝光方式？

- Division or conference structure, which can build or take advantage of rivalries where rival teams play more often, is generally determined by the league. Are there ways that league structures and schedules be reconfigured to increase profit for your team?

分区/分联盟结构通常由联盟决定，它可以塑造或利用“宿敌”对抗（让竞争对手更频繁交手）。是否存在重新配置联盟结构与赛程安排的方法，以提高你球队的利润？

- Determine your own issue that applies to your team or sport and use your model to help decide the issue to improve team performance or owner profit.

自行确定一个适用于你所选球队或项目的议题，并用你的模型辅助决策，以提升球队竞技表现或所有者利润。

How does your model help management adjust when a key player is injured?

当核心球员受伤时，你的模型如何帮助管理层进行调整？

Write a one- to two-page letter to your team's owner and general manager that summarizes your recommended strategy, discusses trade-offs and risks, and reflects on how your plan supports both competitive success and financial health.

撰写一封 1-2 页的信件给球队老板与总经理，概述你推荐的策略，讨论权衡与风险，并说明你的方案如何同时支持竞技成功与财务健康。

Your PDF solution of no more than 25 total pages should include:

你的 PDF 解答总页数不超过 25 页，应包括：

- One-page Summary Sheet.  
1 页摘要页 (Summary Sheet)。
- Table of Contents.  
目录。
- Your complete solution.  
完整解答。
- One-to-Two-Page Letter.  
1-2 页信件。

- References List.  
参考文献列表。
- AI Use Report (If used does not count toward the 25-page limit.)  
AI 使用报告 (如使用; 不计入 25 页总页数限制。)

Note: There is no specific required minimum page length for a complete ICM submission. You may use up to 25 total pages for all your solution work and any additional information you want to include (for example: drawings, diagrams, calculations, tables). Partial solutions are accepted. We permit the careful use of AI such as ChatGPT, although it is not necessary to create a solution to this problem. If you choose to utilize a generative AI, you must follow the COMAP AI use policy. This will result in an additional AI use report that you must add to the end of your PDF solution file and does not count toward the 25 total page limit for your solution.

注: 完整的 ICM 提交稿没有规定最低页数要求。你的全部解题内容及任何补充信息 (例如: 图示、示意图、计算、表格) 最多可使用 25 页。允许提交部分解答。竞赛允许谨慎使用 ChatGPT 等 AI 工具, 但完成本题并不依赖 AI。如你选择使用生成式 AI, 必须遵循 COMAP 的 AI 使用政策; 这将要求你在 PDF 解答文件末尾附加一份 AI 使用报告, 该报告不计入 25 页总页数限制。

## Glossary

### 术语表

Competitive balance is how evenly matched the teams are in a league or competition.

Competitive balance (竞争均衡) 指在一个联盟或赛事中, 各支球队实力接近、胜负难以预测的程度。

Draft is a way for a sports league to assign new players to teams in an organized manner.

Draft (选秀) 是体育联盟以组织化方式将新球员分配给各支球队的一种机制。

Free agency is a system that allows players to choose which team they will play for after their contract with a team expires.

Free agency (自由球员制度) 是指球员与原球队合同到期后, 可以自主选择与哪支球队签约参赛的制度。