Playnest

5 Use Cases of Machine Learning for sports app -Niranjan Pillai (Batch- March 15th)



Problem Statement:
Making Sports Participation Easier

Users of PlayNest find it difficult to explore sports and activities which align with their interests, skill level, geographic location, availability and past activities. Generic search result listing can discourage users and decrease user engagement. An ML based recommendation system would help users discover activities which best suit them.



Problem Statement:

Smart Player Matching
It is challenging to find compatible players based on similar skill level, play style, availability and geographic location. Incompatible players can negatively affect user experience leading to user departure from the platform. ML algorithms can identify player compatibility and suggest the best teammates or opponents.

Demand & Activity Prediction
Sports organizers or venue partners may not have enough insight into when the demand for specific sports, venues or times will rise. As a result, there could be an underutilization of sports venues or insufficient availability during peak times. ML algorithms would be able to predict demand based on the history of the number of bookings, time, location, sport and seasonality.

Churn / Drop-off Prediction
There may be PlayNest users who will gradually lose interest in using the platform but do not communicate reasons for that to the platform itself. Once the user starts showing such behavior, it is challenging to retain them. ML algorithms would be able to predict such behavior based on activity frequency, cancellations, engagement and booking patterns.

Fraud & Fake Activity Detection
The sports community platform can be exposed to the creation of fake profiles, suspicious booking, spamming, duplicate accounts and other unusual activity and transaction patterns. Such detection becomes increasingly challenging as the platform grows larger. ML algorithms would be able to predict such suspicious activity.

Playnest:
One Intelligent
Community Sports Platform

Playnest addresses daily problems in participating in sports using one integrated platform to discover, organize, play, and improve via community sports.

- Find the right games & people
- Simplify planning & coordination
- Build stronger communities
- Track progress & get better



Discover
Find games, players, and communities near you.

Match
Get smart matches based on level interests & goals.

Join
Request or accept invitations and become part of the game.

Organize
Plan venues, schedules, teams, and manage participation.

Play
Show up, have fun, and enjoy great community sports.

Analyze
Track performance, participation & team stats in real time.

Improve
Get insights, coaching tips, and focus on what matters.

Play Again
Keep the cycle going. More games, stronger community, better you.

From ‘I Want to Play’ to ‘I Know Exactly Where, With Whom and How’

Where can I find a game?	Nearby games that fit your time and place.
Who else is playing?	See players, numbers and who’s signed up.
Are they at my skill level?	Smart matching based on your skill and preferences.
Is the location convenient?	Check distance, travel time and facility details.
Will enough players actually show up?	Real-time confirmations and reliability predictions.
Will the teams be balanced?	Fair teams powered by skill-based balancing.
Will the game be competitive?	Competitive match insights so you know it’ll be a good game.



OUTCOME

Playnest turns uncertainty into confidence—so you can focus on what matters: the game.

Why Machine Learning Matters for Playnest

Machine Learning isn't just a technology feature— it's an intelligence layer that makes play simpler, smarter, and more engaging.

BEFORE: Manual & Fragmented

Today, sports coordination depends on:

- **WhatsApp groups**
  Endless messages and missed updates
- **Personal contacts**
  Limited reach and biased invites
- **Spreadsheets**
  Hard to manage, always outdated
- **Multiple apps**
  Scattered information, more complexity
- **Manual coordination**
  Time-consuming and error-prone

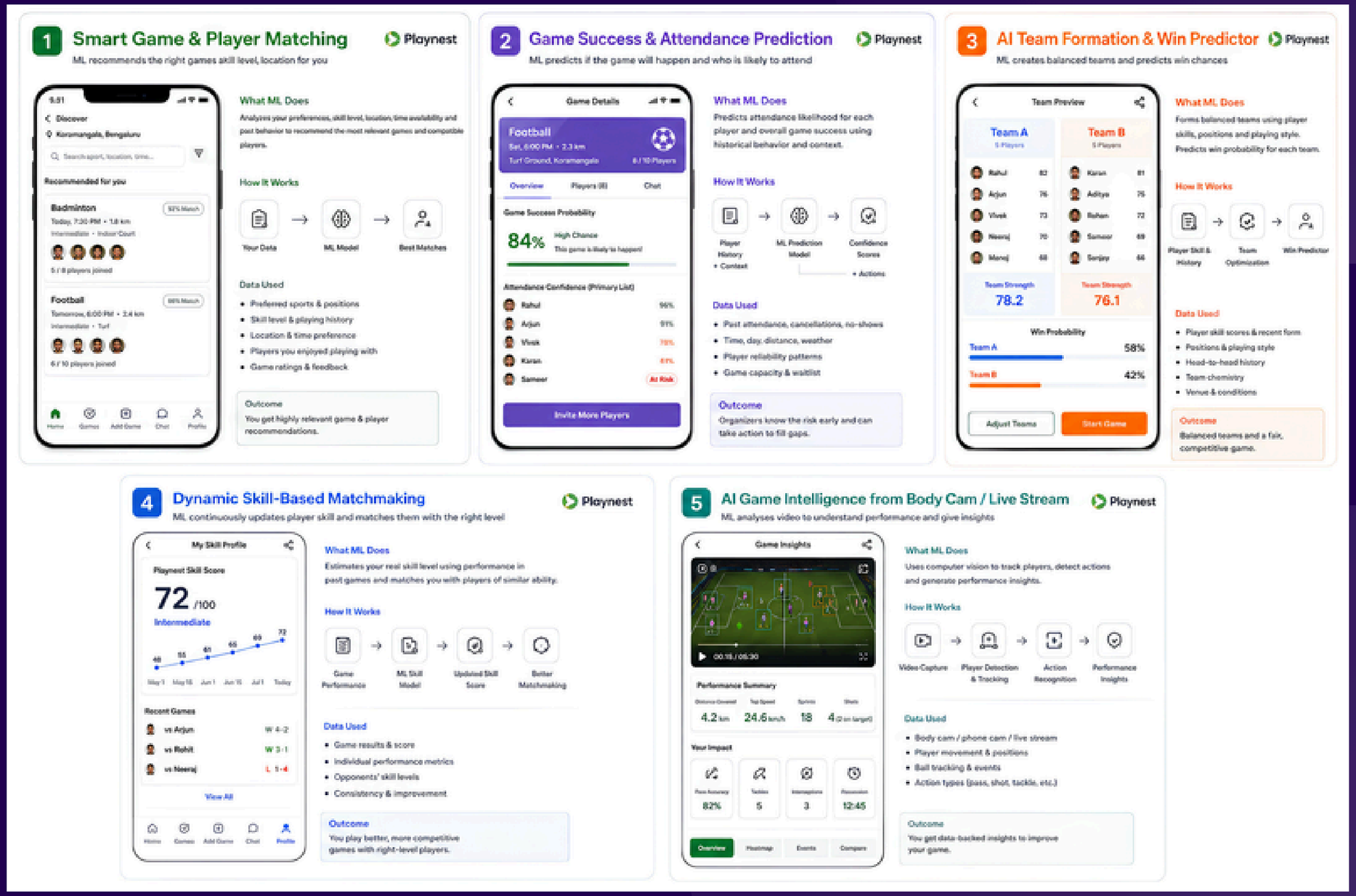
AFTER: Intelligent & Effortless

Machine Learning learns from the signals that matter and turns them into smarter decisions.

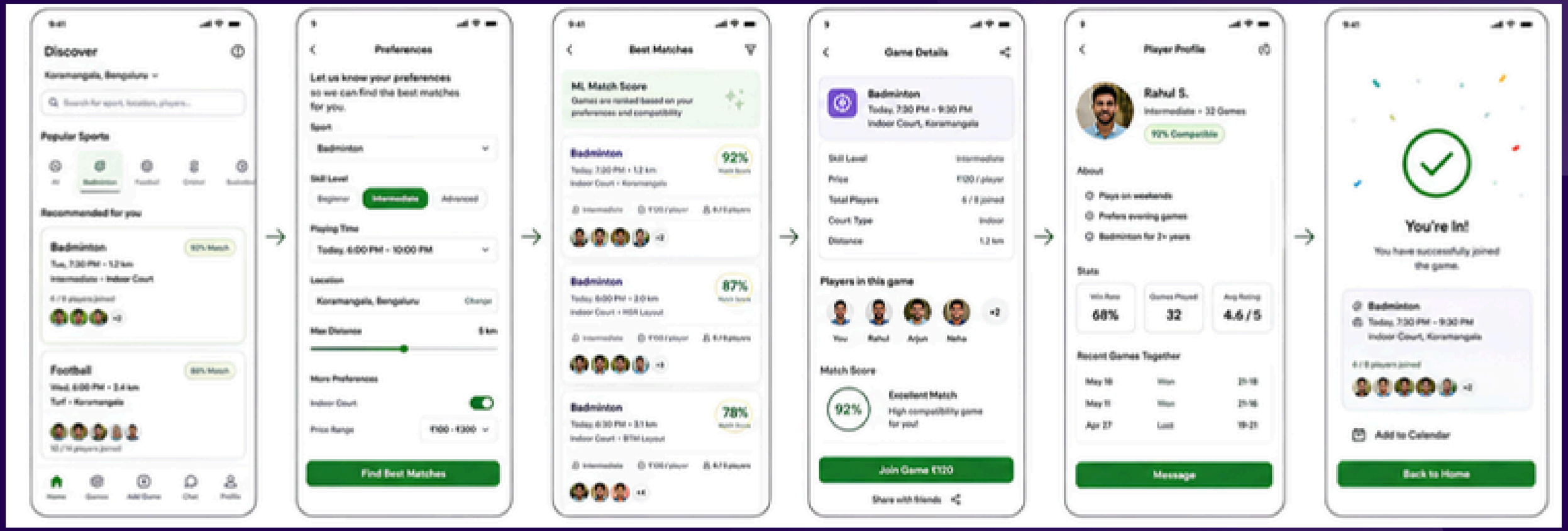
- **Player preferences**
  Understand what players enjoy
- **Game history**
  Learn from past games and results
- **Attendance patterns**
  Identify reliability and behavior
- **Performance insights**
  Track improvement and impact
- **Team composition**
  Build better, balanced teams
- **Game video (with explicit consent)**
  Extract insights to improve play

An intelligence layer that works in the background— so players can just play.

Wireframe & User interface



Use case 1- User flow



2. Use Case 1 - Smart Game & Player Matching

The Human Problem

Looking for the right game entails scanning various platforms, groups, and communities while considering multiple aspects including:

- Sport
- Location
- Time
- Price
- Skill Level
- Player Count
- Playing Preferences



The Promise

Find the right game, with the right people, at the right time.

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Playnest Learns
What Makes a Game Right for You

Playnest learns your preferences, playing history, and behavior to recommend relevant games and compatible people.



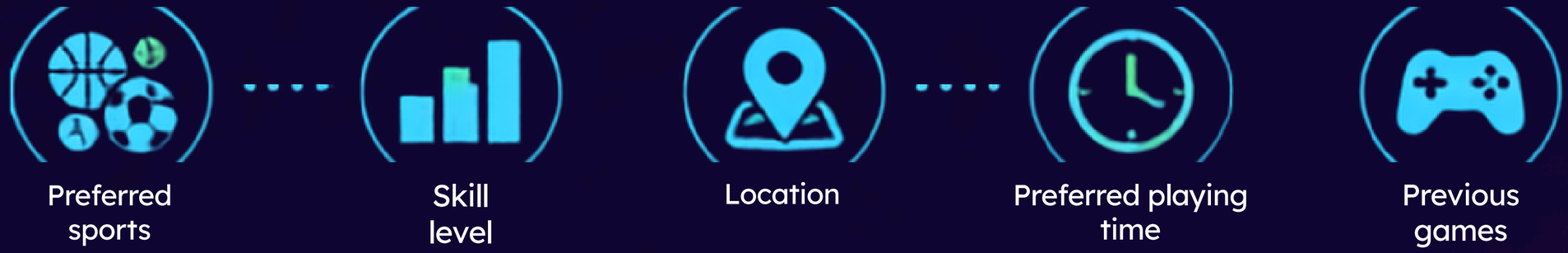
THE 5 MOST IMPORTANT MATCHING FACTORS

1. Sport
2. Location
3. Time
4. Skill Level
5. Preferences

Playnest:
What the Model Learns From

Playnest uses the information players choose to share to create smarter matches, stronger communities, and better experiences.

THE DATA WE LEARN FROM



A Recommendation That Feels Personal

Playnest uses machine learning to understand your preferences, skill level, and availability—so every recommendation feels just right.



Badminton

Today, 7:30 PM

1.2 km away

Intermediate

The **92%** score is Playnest's predicted compatibility between the player and the game.

Match

Learn You

Understands your skills, interests, and habits.

Fits Your Time

Matches games that fit your schedule.

Close to You

Finds great options near you.

Better Over Time

Gets smarter with every game you play.

Discover

Find games near you.

Match

Get smart matches.

Join

Request or accept invitations.

Organize

Plan, coordinate, and manage.

Play

Show up, have fun, and enjoy.

Analyze

Track performance and progress.

Improve

Get insights and coaching tips.

Play Again

Keep the cycle going. More games, stronger community.

Playnest:

From Opening the App to Joining the Game

Less searching. More playing.



1 Open Playnest

2 Set preferences

3 Machine learning monitors user data

4 Games are scored and ranked

5 View game details

6 Check suitable players

7 Join game

Technology behind it

Playnest uses machine learning to understand your preferences, evaluate the best matches, and surface activities you'll love.



- Find relevant games faster
- Reduce search effort
- Discover compatible people
- Increase the likelihood of participation
- Create a more personal sports experience

In contrast to movies or music recommendation sites, Playnest recommends an actual activity that includes people, places, time, and skills at once.

Technology behind it

Knows the preferences, behavior, and gaming history of each user to suggest the most suitable games and gamers.

How It Works

1. User Data
Preferences + Skill + Location + History
↓
2. ML Model
Learns player interests & behavior
↓
3. Match Scoring
Scores games and players based on compatibility
↓
4. Personalized Recommendations
Shows the best games and players

Technology Behind It

- Recommendation System

Understands which games/players matter to each user.

- User and Game Embedding

Transforms users, games, and player features into numeric values such that the system is able to identify similarities.

- Similarity Matching

Identifies similarity between the user's profile and games and players.

- Ranking System

Ranks the possible matches from more relevant to less relevant.

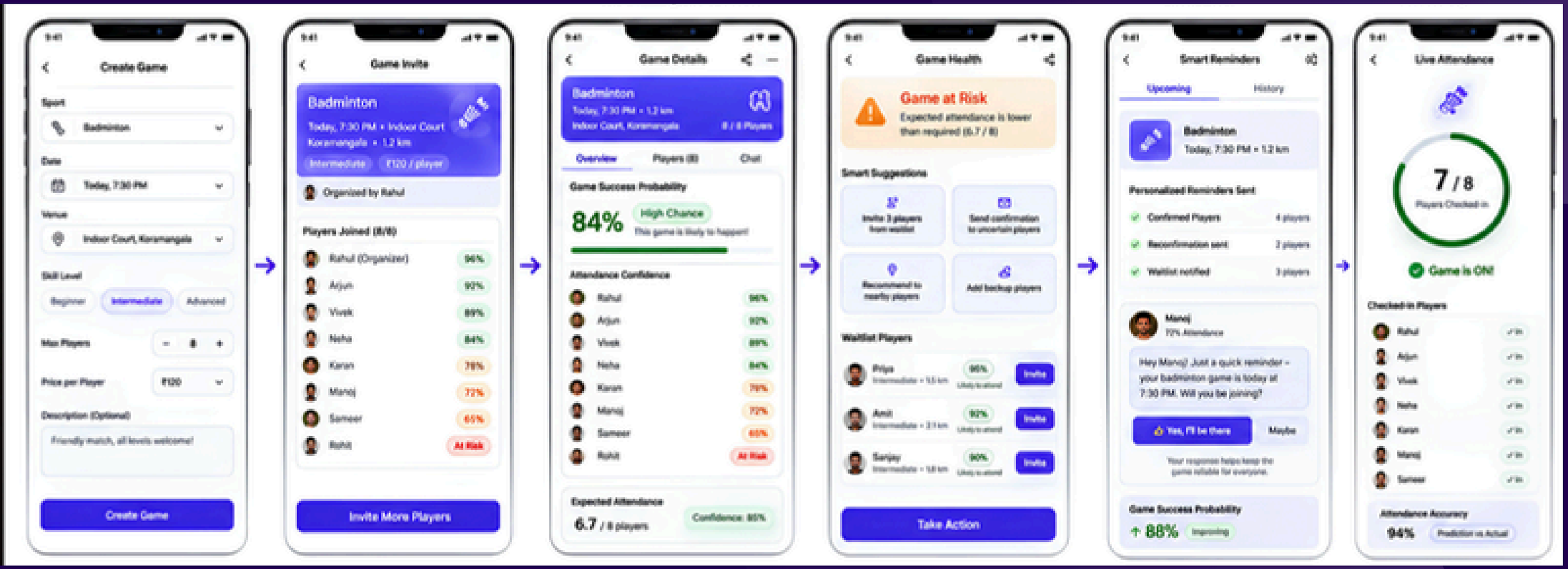
Example

User Profile
Badminton | Intermediate | 7–9 PM | Within 5 km

Available Games
Badminton — 1.2 km → 92% Match
Badminton — 2.0 km → 87% Match
Football — 2.4 km → 80% Match

The ML model doesn't simply choose the closest game. It considers multiple factors together.

Use case 2- User flow



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Use case two

AI Attendance & Game Success Prediction

Community sports games often fail because of no-shows.

8/8 players joined

The game is set. It works!



Game is balanced and ready to play.

High chance of a great game.

2 players don’t attend

The game may no longer work properly.



Unbalanced teams, cancellations, or wasted time for others.

Low chance of a good game.

Playnest predicts whether the game is likely to happen successfully.

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Attendance Confidence Is About This Game

The Playnest measures the probability that each individual will come to watch this particular match, depending on the opponent, time, place, weather, and much more.

Not a permanent label.

These predictions are game-specific and context-driven, not a judgment about the person.

Estimated likelihood of attending this game

Rakesh	96%
Niru	91%
Alpesh	78%
Junaid	61%
Aryan Kaushal	At Risk

EXAMPLE CONTEXT

Estimated likelihood of attending this game:

Game-Specific
Changes with opponent, time, location & more.

Smart Signals
Uses patterns and behaviors to inform each prediction.

Actionable Insight
Helps coaches and teams plan with greater confidence.

Respectful & Fair
Built to be accurate, private, and person-first.

What Helps
Playnest Predict Attendance?

The model learns patterns from past behaviour and the specific game context.

Player history

- Previous attendance
- Games joined
- Games attended
- Cancellations
- Last-minute cancellations
- No-shows
- Check-in history

Game and schedule

- Distance from venue
- Preferred playing time
- Day of week
- Game time
- Waitlist size
- Time between booking and game

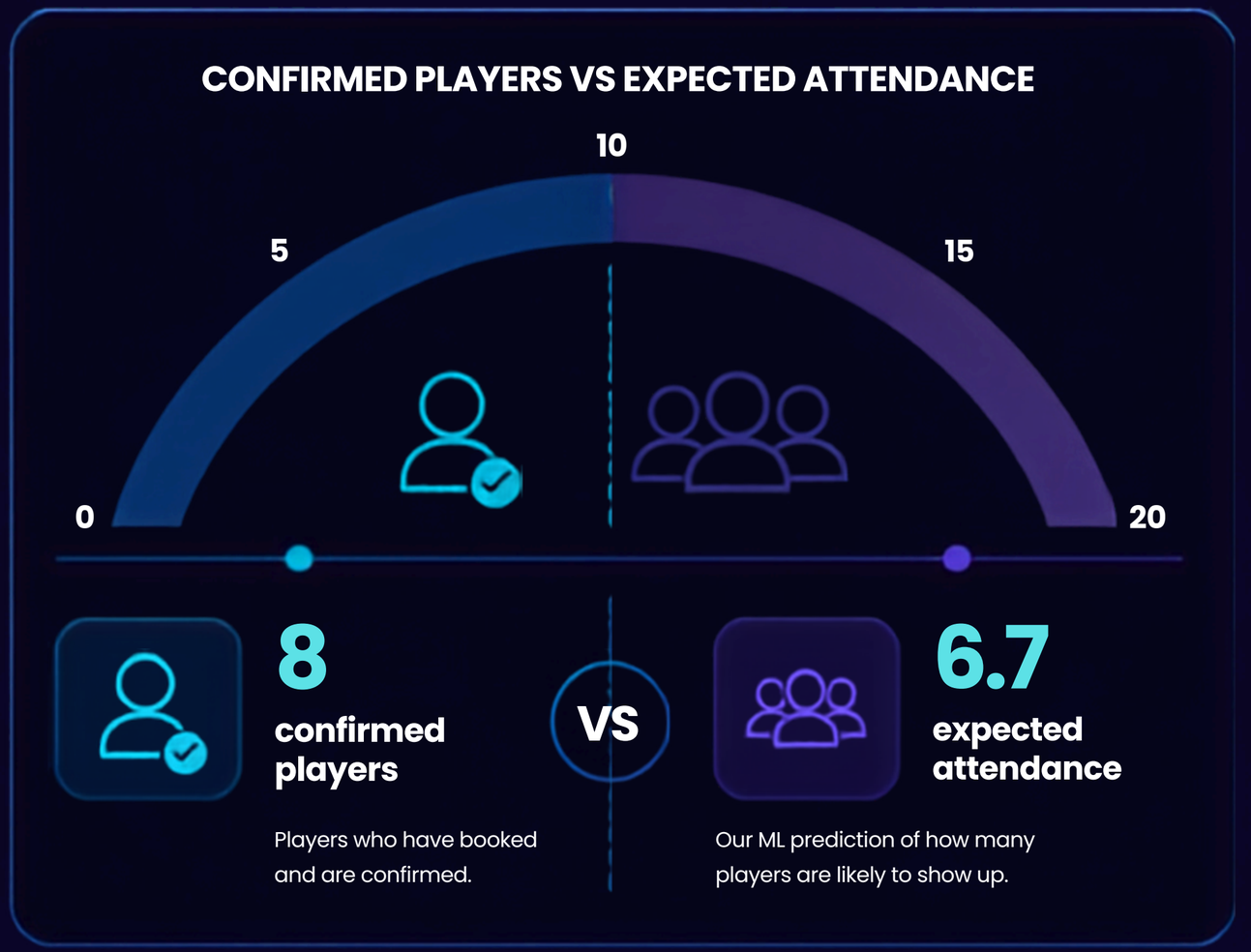
From Player Predictions to Game Confidence

In contrast to the total bookings, Playnest goes further and predicts whether sufficient players will show up to make the game successful.

Game at Risk

We use machine learning to predict show-ups, so you can make smarter decisions with confidence.

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Even with 8 confirmed players, our model predicts only 6.7 are likely to attend. **That's below the recommended threshold of 10.**

Why This Use Case Matters

Playnest differs from the traditional method of registering attendance after an occurrence by using past behavior to predict the success of a real-world future event.

Fewer failed games.

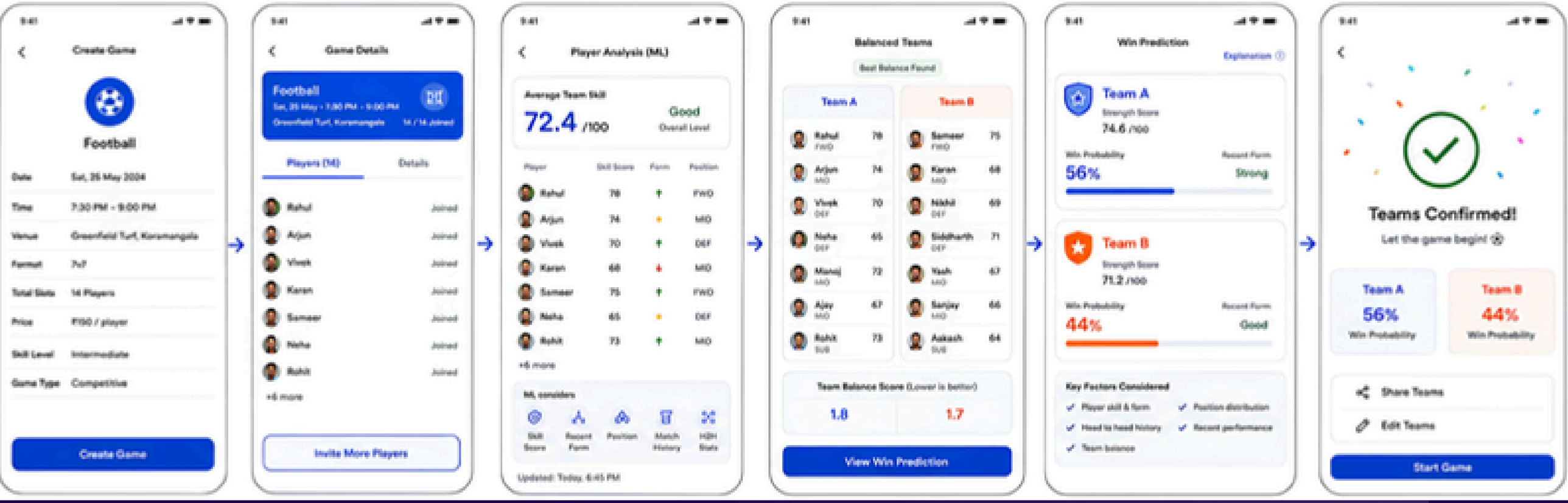
Earlier decisions.

More people actually playing.



Playnest looks beyond sign-ups to predict real-world outcomes—**before** game time.

Use case 3- User flow



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Use Case three -
AI Team Formation & Win Predictor

The human problem

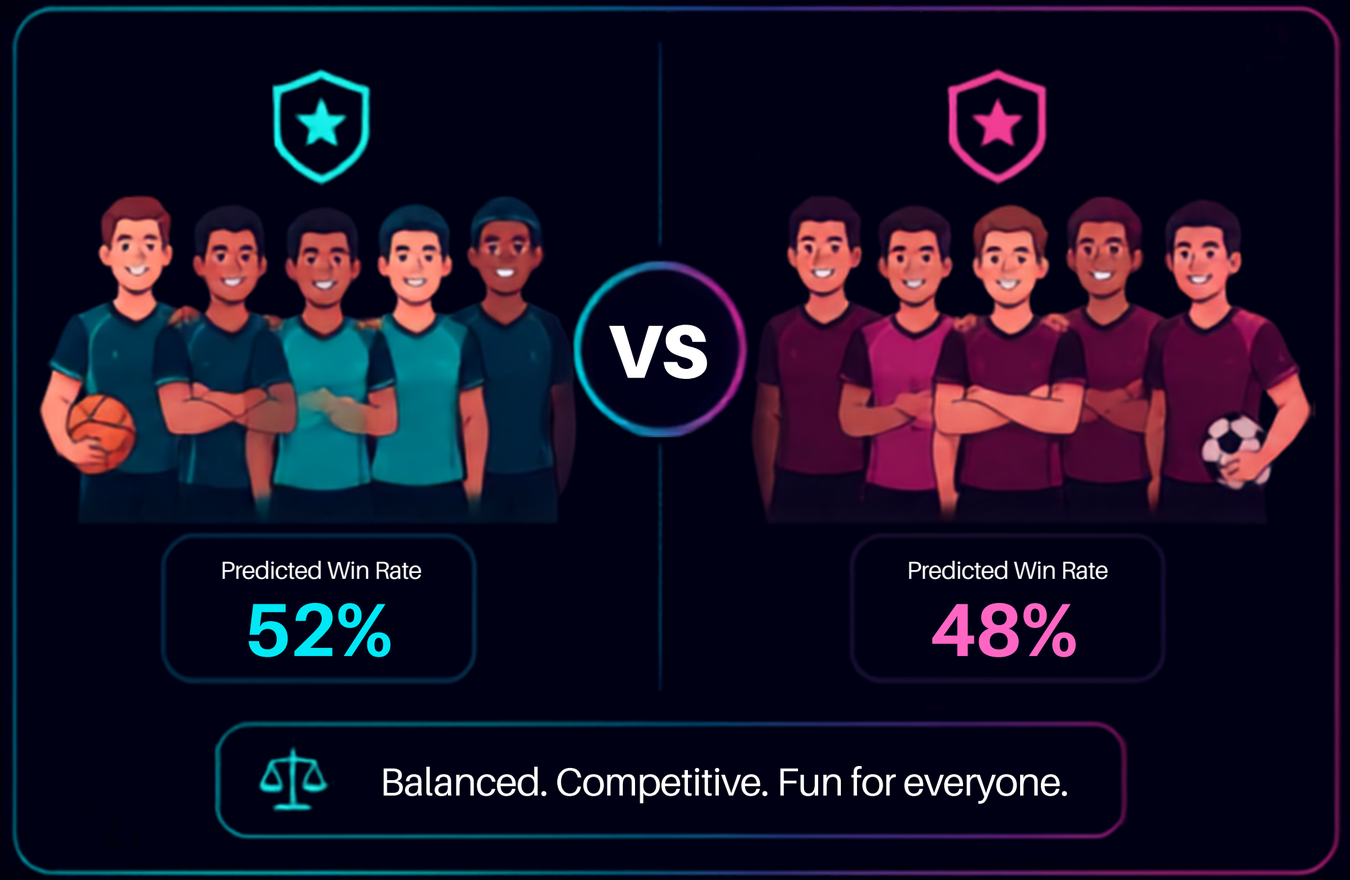
Balancing teams manually is not an easy task. Putting the best five players together may cause the team to become too strong.

The player question

How competitive are these teams?

The promise

Playnest helps create **fairer teams** before the game begins.



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Playnest Builds Teams, Not Just Line-Ups

The Playnest uses the player's performance data along with an optimization model to balance the teams and calculate their win probability.

Player Ability

- Player skill score
- Recent performance
- Win/loss record
- Position
- Playing style

Game Context

- Head-to-head history
- Team history
- Team chemistry
- Venue conditions
- Player availability

Optimization Algorithm

Balanced Teams & Win Probability

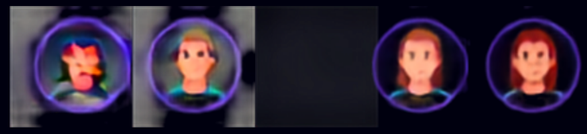
Team A



54%
Win Probability

VS

Team B



46%
Win Probability

The goal is a competitive game where everyone has a fair chance.

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From an Unbalanced Game to a Fairer Match

Playnest helps create better matches for everyone.

1. Recognize
The system checks each game and sees if the teams are too uneven.

2. Test Combinations
It tries different player combinations to find a better balance.

3. Create Fairer Match
The system builds teams that are more even and more fun to play.

Initial teams:

Team A – 72% | Team B – 28%



Final teams:

Team A – 52% | Team B – 48%



Playnest turns unbalanced games into fair matches everyone can enjoy.

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A Win Predictor That Explains the Estimate

Our model evaluates team strength, recent form, and historical context to estimate the likelihood of a win.

Team A

- Team Strength: 78.2
- Recent Form: Strong
- Win Probability: 58%

VS

Team B

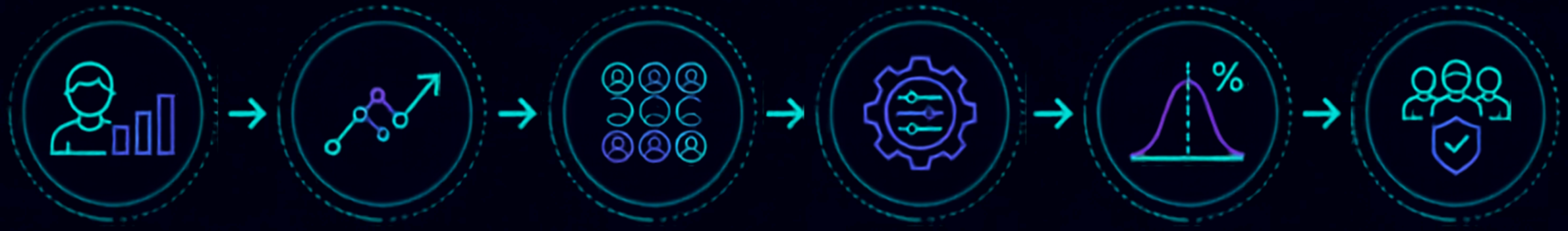
- Team Strength: 76.1
- Recent Form: Moderate
- Win Probability: 42%

Based on available historical and current data, Team A has an estimated 58% probability of winning.

This is not a guaranteed winner prediction.

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How Playnest Forms Balanced Teams



Player Performance Data → Skill & Form Estimation → Potential Team Combinations → Team Management → Win Probability Model → Balanced Teams

The model **explores possibilities** so organizers don’t have to.

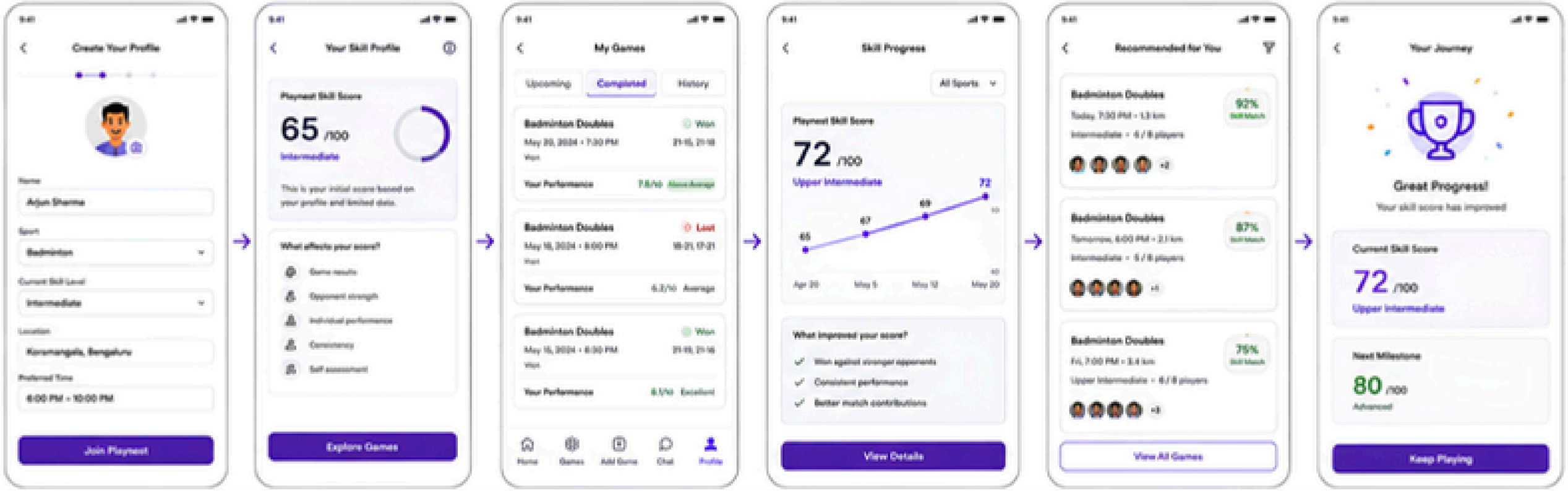
Why This Use Case Matters

- Reduces organizer effort
- Creates more competitive games
- Improves fairness
- Makes team selection data-informed
- Can increase player enjoyment


My weplay Team

It incorporates Machine Learning, optimization, and practical group decision-making processes rather than simply suggesting information to users.

Use case 4- User flow



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Use Case four – Dynamic Skill-Based Matchmaking

Self-declared skill levels are subjective and can mean very different things to different people.

People label themselves

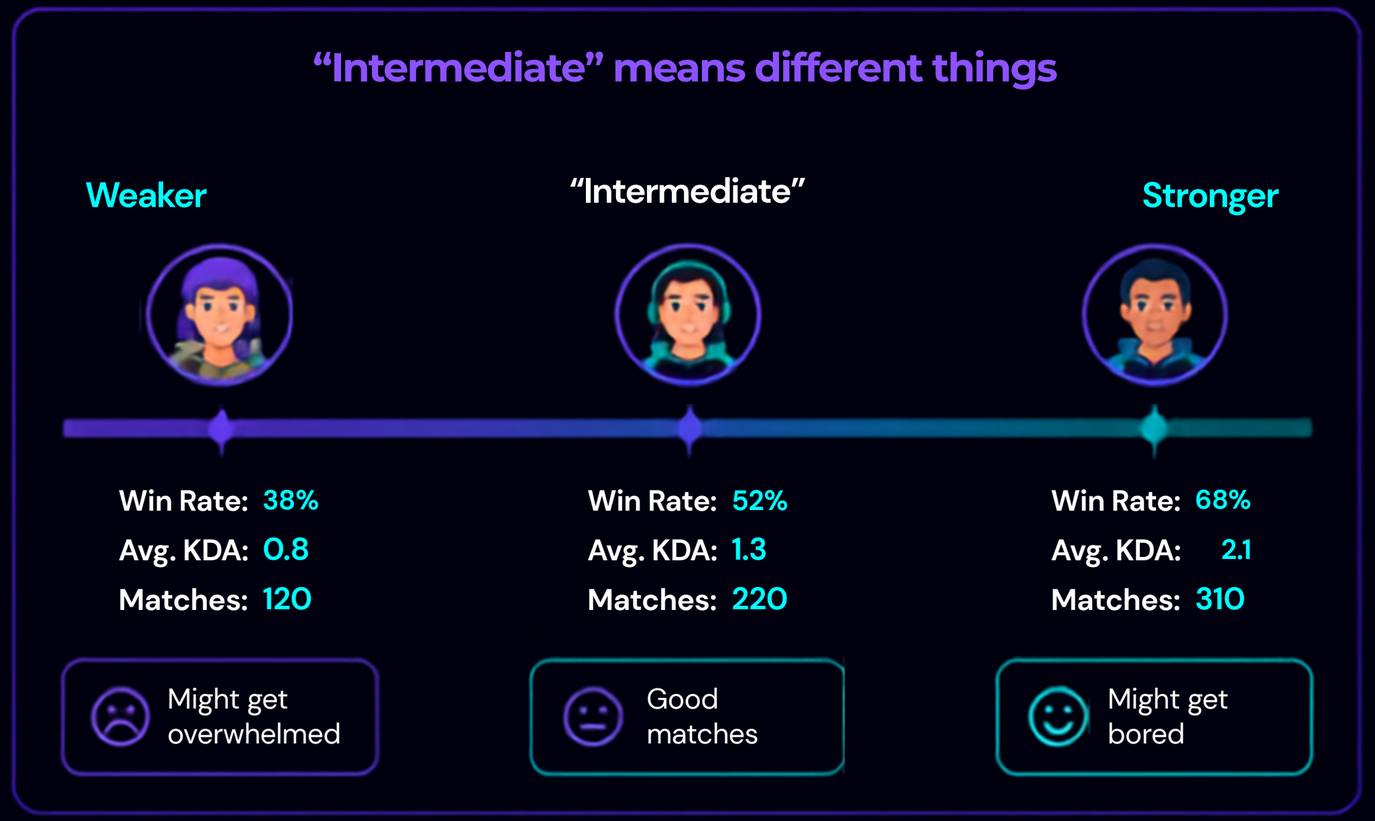
Players choose labels like “Beginner”, “Intermediate”, or “Advanced”.

Same label, different meaning

An “Intermediate” player in one region may be a top performer in another.

Leads to uneven matches

Matches can feel too easy, too hard, or just not fun for everyone.



How can Playnest make skill level more meaningful?

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From Labels to Evidence

Playnest constantly analyzes the player's level of expertise based on information collected during various games rather than using just labels like Beginner, Intermediate, or Advanced.

Playnest (weplay super regulars) Skill Score:

72 /100

A clearer picture of ability helps players find more compatible games.



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What Helps Playnest Estimate Skill?

Game results

Wins, losses, and outcomes

Opponent strength

Who you played and how strong they are

Individual performance

Your in-game impact and statistical output

Player ratings

Existing rating systems and external benchmarks



Match history

Your past matches and results

Recent form

How you've performed lately

Consistency

Stability of performance over time

Self-assessed skill

Your own perspective and confidence

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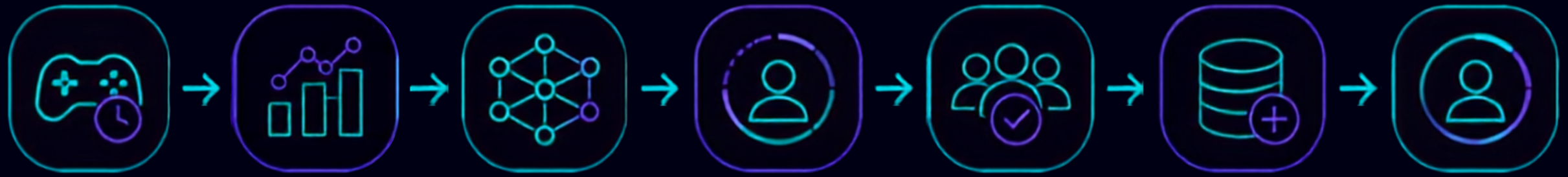
A Skill Score That Learns With You

Through many games, the model recognizes that the player is good at playing against opponents that are progressively better.



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Matchmaking That Keeps Learning



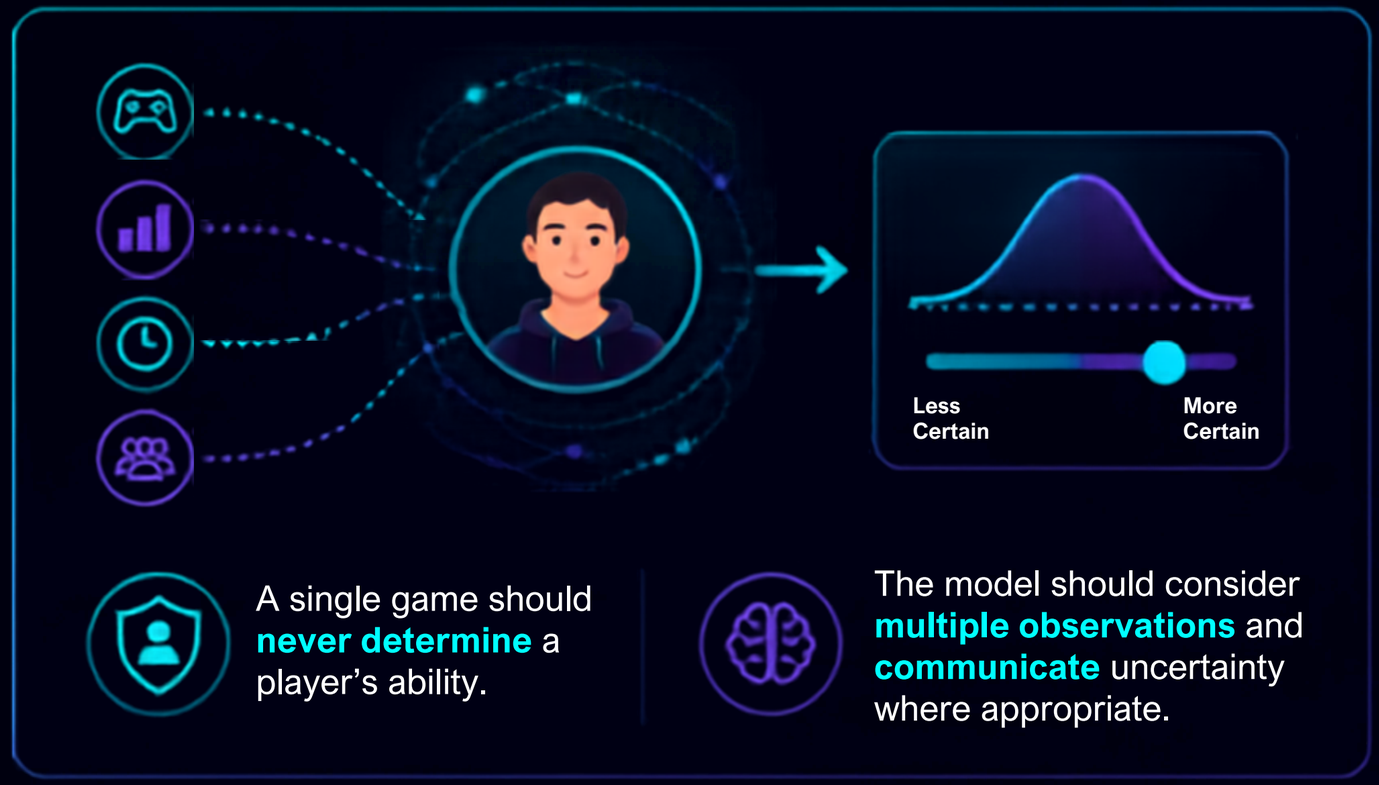
Game History → Performance Features → Skill Ranking Model → Dynamic Skill Estimate → Compatible Game Recommendation → New Game Data → Updated Skill Estimate

Each game creates context that makes the next suggestion more appropriate.

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Fairer Matchmaking, With Room for Uncertainty

- **Better** player compatibility
- **More** competitive games
- **Reduced** skill mismatch
- **Better** user satisfaction
- **Matchmaking that keeps improving**

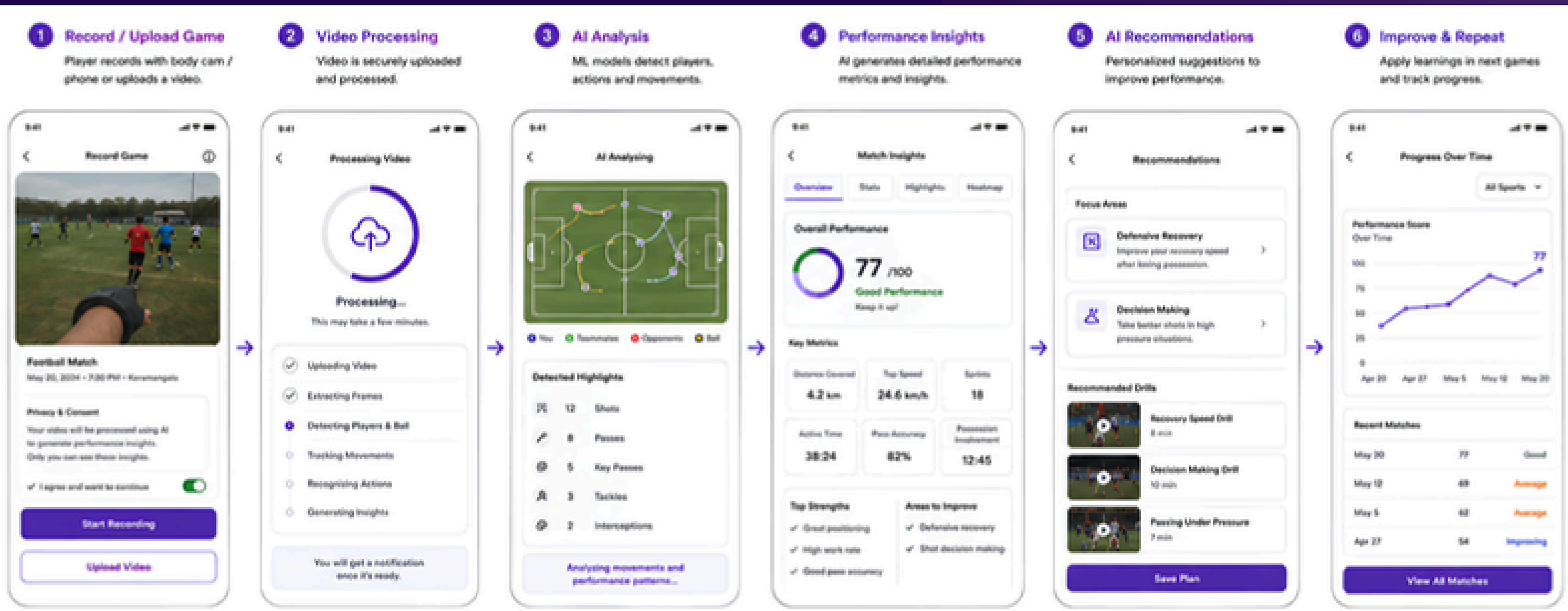


A single game should **never determine** a player's ability.

The model should consider **multiple observations** and **communicate** uncertainty where appropriate.

It converts player matching into an ongoing learning process instead of depending completely upon the self-declared skill level of the players.

Use case 5- User flow



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Use Case Five – AI Game Intelligence from Body Cam / Live Stream

The Human Problem

After a game, players often know the final score but **not...**

- How efficiently they moved
- Where they positioned themselves
- How many actions they performed
- Where they made mistakes
- What they could improve

A coach can offer this perspective, but analyzing all players and games by hand is not an easy task.



The ML Solution

With explicit **user consent**, Playnest can analyze...

- Body cam footage
- Phone-camera recordings
- Authorized live streams
  Example: weplay live streams - youtube
- Venue camera footage like one in CJ turf ,Chemnur mumbai

Turn game footage into useful, personal feedback.

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Movement Alone Does Not Prove Skillful

A player running very fast isn’t necessarily a good football player.

While Playnest is concerned with relating bodily movements to gaming, skill assessment method concentrates only on movement.

Movement Signals We Measure



- Player Position
- Distance Covered
- Speed
- Acceleration
- Deceleration
- Change of Direction
- Recovery Position
- Body Alignment
- Movement Efficiency
- Spatial Positioning

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From Movement to Meaningful Game Actions

Computer vision connects **body movement** to actions that happen **over time**.

Football



- Pass
- Shot
- Tackle
- Interception
- Dribble
- Positioning

Badminton



- Serve
- Smash
- Rally
- Forehand
- Backhand
- Recovery position

Basketball



- Dribble
- Pass
- Shot
- Rebound
- Defensive positioning

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A More Complete Picture of Player Ability

Our model combines many signals over time to estimate true playing ability.

Movement

Actions

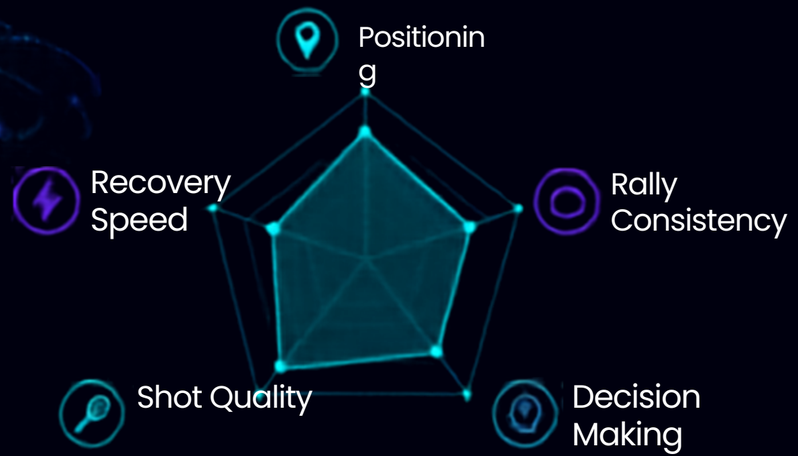
Decisions

Game Outcomes

Historical Performance

Performance / Skill Model





Player Skill Estimate:

77 /100



Strong positioning and rally consistency; improvement opportunity in recovery speed.

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How Playnest Turns Video Into Insight



1. Computer Vision

identify players, balls, and objects in each frame



2. Object Detection

identify player, ball, goal, court, and field



3. Player Tracking

follow the same player across frames



4. Pose Estimation

identify head, shoulders, elbows, wrists, hips, knees, and ankles



5. Action Recognition

identify actions over time



6. Performance Modeling

combine extracted information with game results and historical performance

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From Game Footage to Personal Improvement

Body Cam / Live Stream → Video Processing → Player & Ball Detection → Player Tracking → Pose Estimation → Action Recognition → Movement & Performance Features → Skill / Performance Model → Personalized Insights → Better Matchmaking & Team Formation

Example: Football Match



Performance Metrics (This Game)

Distance Covered:	4.2 km
Top Speed:	24.6 km/h
Sprints:	18
Pass Accuracy:	82%
Successful Tackles:	5
Interceptions:	3
Possession Involvement:	12:45

Personalized Insights

Skill Score: **77/100**

Strength: **Positioning**

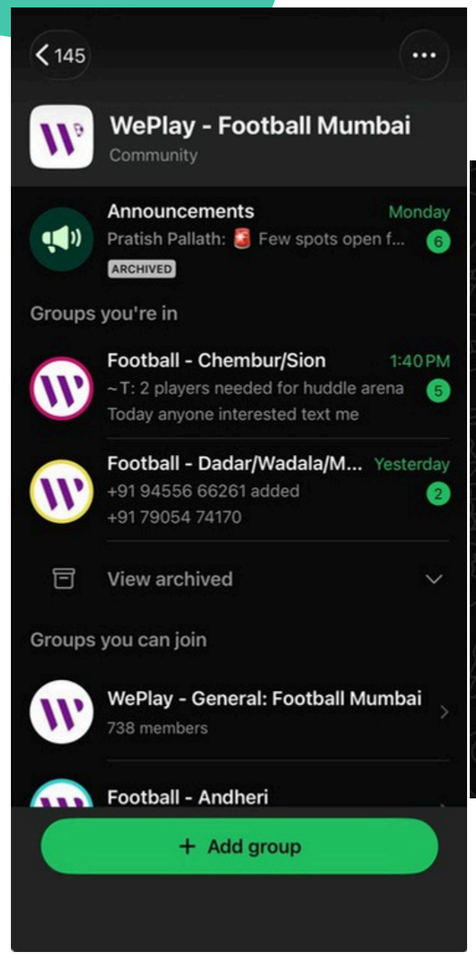
Strength: **Passing**

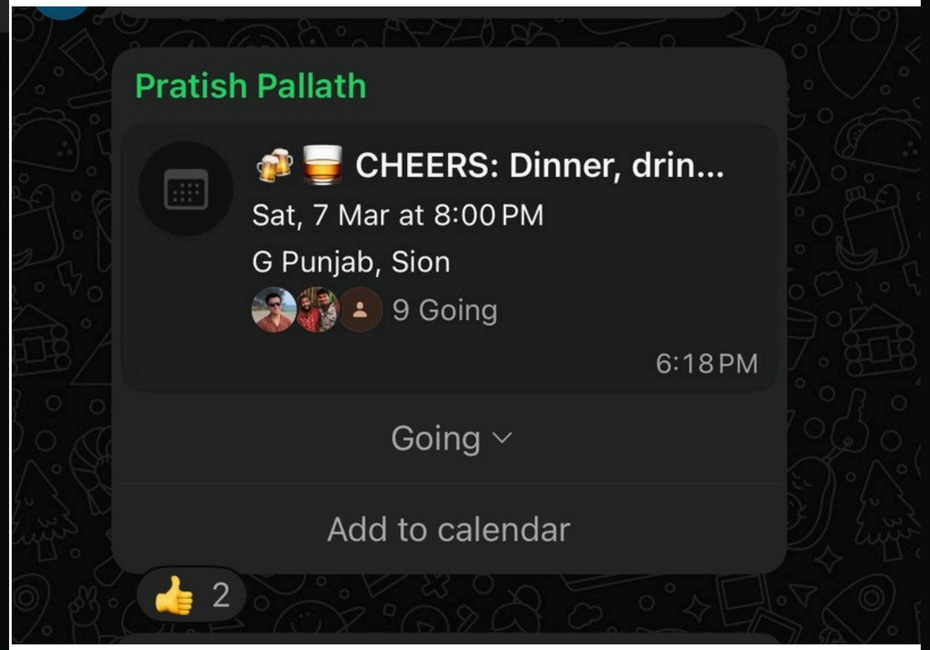
Improvement: **Defensive recovery**

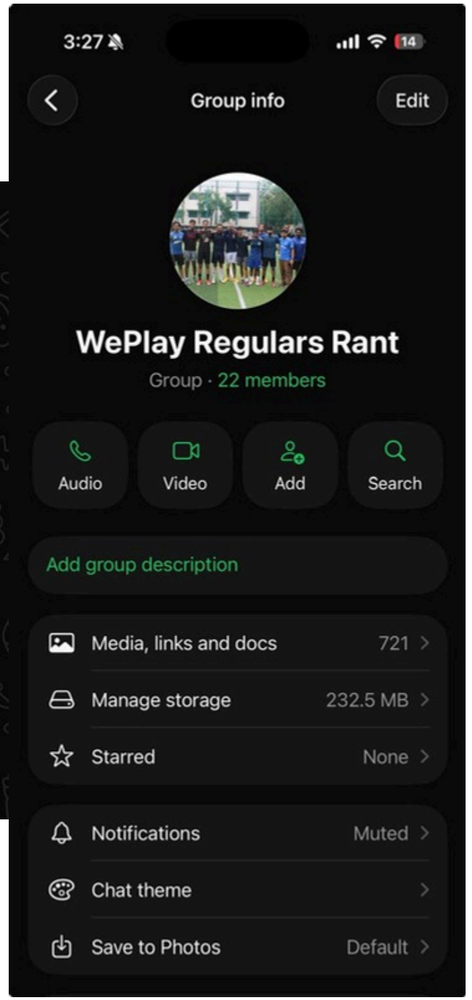
These metrics are combined with your previous games to continuously improve your skill model and insights.

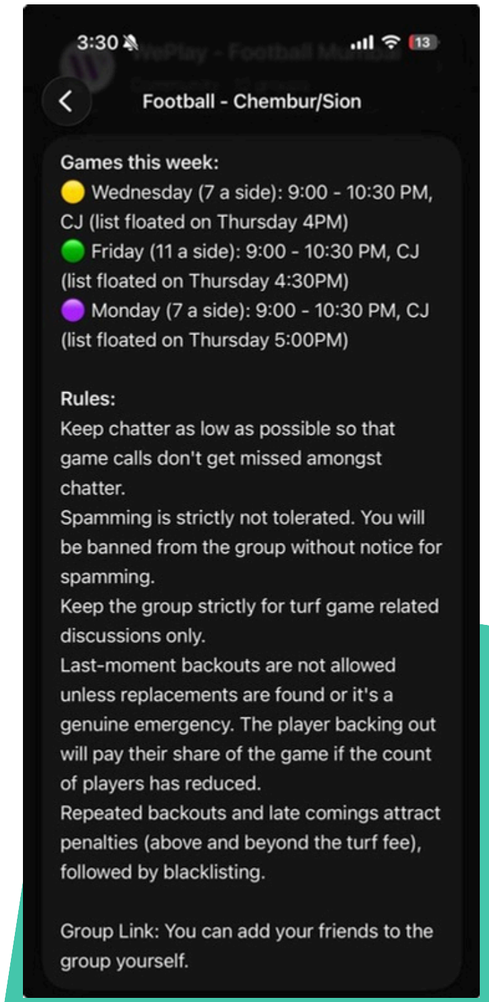
Screenshots of Close Knit community (WePlay Community)

Niranjan Pillai









Vision for My Project

Our Vision

To ensure that playing sport is as easy as hailing a cab or making an order for food – whereby everyone can find the appropriate game to play, the appropriate company to play with, and keep on improving.

Playnest seeks to create a future of:

📚 Discover
Discover games near you which fit your sport, venue, time, and skill level.

📚 Connect
Connect with compatible players and form communities of sports fans.

📚 Match
ML-based better matching of players and skill levels.

📚 Play
Improve each game by forecasting attendance and teaming.

📚 Improve
Get personalized data about your performance through consensual game video analysis.

📚 Return
Leverage every game to make smarter recommendations for the next one.