OU WBB DEFENSIVE ANALYTICS PROJECT
2025-2026

PROJECT SUMMARY

This project builds a defensive analytics system that evaluates how effectively OU guards specific play calls and in-play actions. Each possession is tagged with the play name (e.g., Horns Flare, Zipper Pin-down, Spain PNR), the actions involved (e.g., DHO, Flare, Pin-Down), the sequence of actions, the defensive coverage, and the quality of the resulting shot. It also incorporates team-specific designations—labeling players as Blue (Primary Player), Green (Shooter), and Black (Role Player)—to analyze how defensive success varies by scouting emphasis, personnel matchups, and tendencies such as which actions most often lead to players getting stuck on screens. The system was developed from the perspective of a practice player involved in watching and running opponent scouts, designed to measure how effectively OU executes its defensive coverages in game situations. This provides detailed defensive insight—linking specific play calls, coverage types, and outcomes that aren't easily captured by existing film or stats platforms, giving new visibility into how the defense performs against exact opponent actions.

SYSTEM WORKFLOW

Step 1: Game Download

Downloads complete game footage from YouTube or ESPN+ and converts to MP4 format.

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Step 2: Defensive Possession Filter

Processes ESPN play-by-play data to automatically identify OU defensive possessions.

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Step 3: Quick Clip Tagger

Browser application for marking timestamps and tagging possessions across 20+ defensive categories.

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Step 4: Analytics Workbook

Central Excel database where coverage, play calls, and outcomes are recorded—producing metrics such as Stop Rate, EPV, SOS%, and Breakdown%.

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Step 5: Clip Extraction

Cuts the full MP4 into labeled clips for every defensive possession using timestamps from the Analytics Workbook.

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Step 6: Clip Dashboard

Interactive HTML dashboard displaying all defensive clips by quarter and possession with comprehensive filters.

TAGGING FRAMEWORK

Context / Identifiers

Game #
Opponent
Quarter
Possession #
Situation
Offensive Formation

Defensive Components

Defensive Coverage
Ball Screen Coverage
Off-Ball Screen Coverage
Help/Rotation
Defensive Disruption
Defensive Breakdown

Plays & Actions

Play Name
Action Trigger
Action Type(s)
Action Sequence

Results

Play Result
Paint Touches
Shooter Designation
Shot Location
Shot Contest
Rebound Outcome
Points
Notes

EXCEL DOWNLOAD & EXAMPLE COLUMNS

Columns A - I

Game #	Opponent	Quarter	Possession #	Situation	Offensive Formation	Play Name	Covered in Scout?
34	Iowa	1	1	Early Offense	4-OUT 1-IN	Post Entry Pindown	No – Not Practiced

Columns K - R

Action Trigger	Action Type(s)	Action Sequence	Defensive Coverage	Ball Screen Coverage	Off-Ball Screen Coverage	Help/ Rotation
Post Entry	Pin Down	Post Entry → Pin Down (Top of Key) → Curl to Mid-Range	Man	N/A	Over (Stuck)	None

Columns T - AB

Defensive Disruption	Defensive Breakdown	Play Result	Shooter Designation	Shot Location	Shot Contest	Rebound Outcome	Points
None	Yes, Screened on Pin-Down.	Missed FG	Blue	Short Midrange (11–14 ft)	Open (4+ ft)	DREB	0

DEFENSIVE CLIP TAGGER

QUICK CLIP TAGGER: SYSTEM OVERVIEW

The Quick Clip Tagger is a custom-built application that gathers video review, tagging, and data storage into one system. It was built using HTML, CSS, JavaScript, and Python, the tool connects directly to Excel through a Python bridge, saving all tagged possessions to the Analytics Workbook in real-time. The ESPN play-by-play filter automatically identifies defensive possessions and provides game clock timestamps, allowing quick navigation to the exact moment each possession begins. Once saved, all clips are automatically added and organized in the Clip Dashboard. This is an HTML dashboard/library where possessions can be filtered and reviewed by game, quarter, play type, coverage, and result. This integrated workflow significantly speeds up the tagging and analysis process.

Key Features

Video Control Features

- Playback speed control (0.5x, 1x, 2x)
- Frame-by-frame navigation (+/- 5s, +/- 10s)
- Mark IN/OUT timestamps with keyboard shortcuts

Play-by-Play Filter

- Paste ESPN play-by-play text
- Automatically identifies OU defensive possessions
- Provides game clock timestamps for precise video navigation
- Shows possession number, time range, and result

Tagging Features

- 25+ side scroll category input fields with dropdown suggestions
- Multi-select capability for action types (comma-separated values)
- Auto-incrementing possession numbers
- Real-time data validation

Excel Integration

- Direct save to Excel workbook via Python bridge
- Row-aware saving (choose which row to write to)
- Overwrite protection (warns if row already contains data)

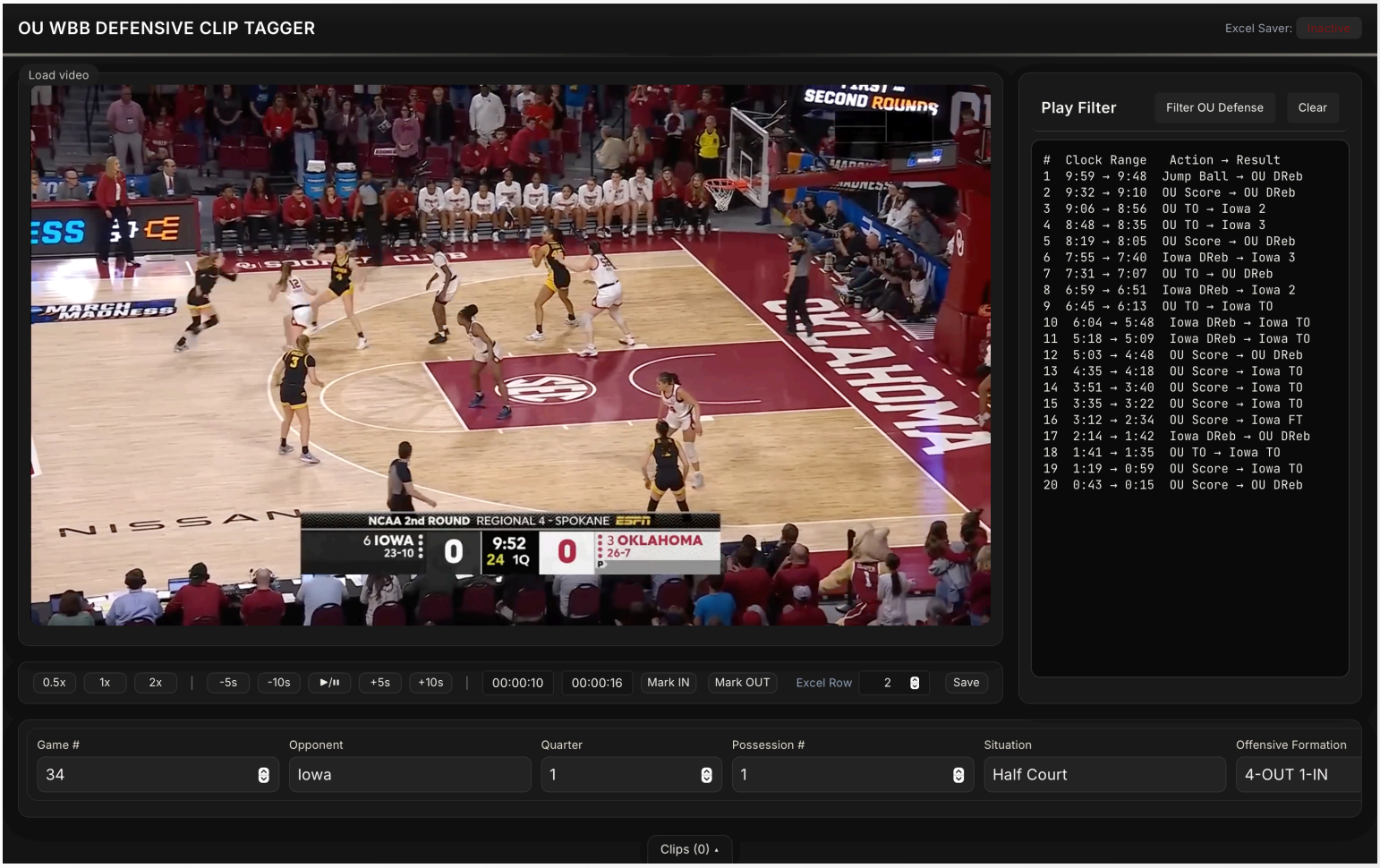
DEFENSIVE CLIP TAGGER

Clip Queue

- View all saved clips in expandable drawer
- Jump to specific possession timestamp by clicking
- Delete clips from queue
- Shows metadata (quarter, possession, play name, coverage, result)

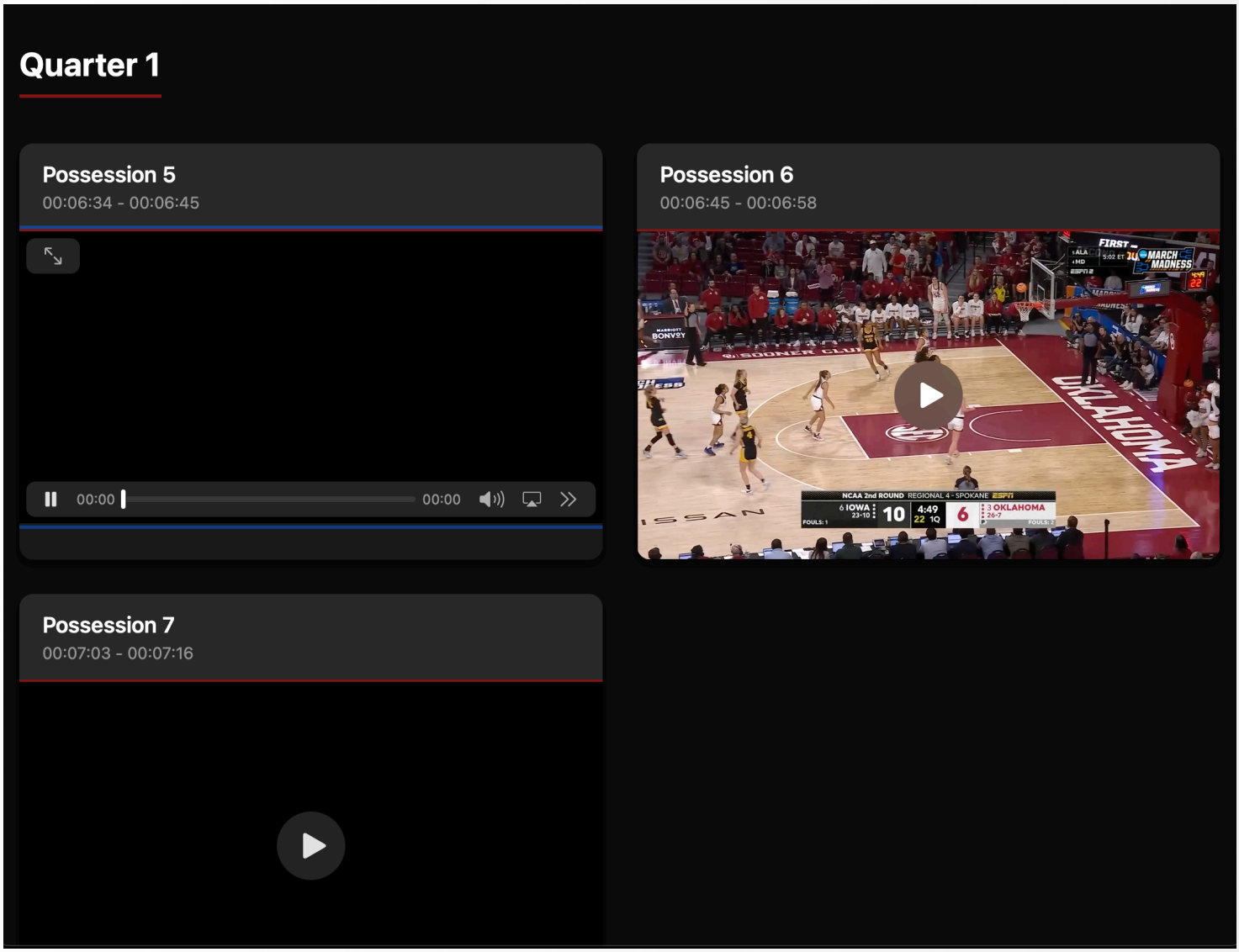
Clip Dashboard

- Playback of extracted possession clips
- Filter by game, quarter, play type, coverage, and result
- Organized by possession number
- Interactive review system for all tagged possessions



[Clip Tagger Interface]

DEFENSIVE CLIP DASHBOARD



[Clip Dashboard]

METRICS & ANALYTICS

Examples of Game Metrics

METRIC	EXPLANATION
Breakdown Rate by Action Type	Breakdown % separated by individual action type (DHO, Ball Screen, Off-Ball Screen, Stagger, Flare, etc.)
Breakdown Rate by Play Type	Breakdown % separated by complete play calls (Horns Flare, Zipper Pindown, Horns Double Stagger, etc.)
Scout Translation Gap	Difference in breakdown % between scouted plays and unscouted plays
Screen Type Vulnerability	Breakdown % separated by screen type (Ball Screen vs. Off-Ball vs. Stagger vs. Flare)
Stuck On Screen %	% of possessions where a defender made significant contact or was stuck on a screen.
Action Density Gap (Score vs. Stop)	Difference in average actions when opponent scored vs. when stopped
Blue vs. Green vs. Black PPP	Points per possession allowed when Blue (primary), Green (shooter), or Black (role) players involved
Clean Possession Rate	% of possessions with no breakdown + contested shot + secured DREB
Breakdown Streak (Longest)	Most consecutive half-court possessions without a defensive breakdown
Scouted Plays Run (Count/Total)	Number of possessions where opponent ran plays covered in scout vs. total
Screen Navigations (Success/Total)	Number of screens navigated cleanly vs. total screens faced
Number of Forced Offensive Breakdowns	Possessions where defensive pressure caused opponent miscommunication/chaos
Number of Forced Isolations	Possessions where defense disrupted structure and forced desperation ISO
Average # of Actions per Possession	Average number of actions opponent ran per half-court possession

** A breakdown occurs when the defense gives up a quality shot or possession regardless of whether it results in points.*

METRICS & ANALYTICS

Examples of Season-Long / Aggregated Metrics

METRIC	EXPLANATION
Scout Preparation Score	Statistical measure of whether higher scout coverage percentage (more plays practiced) correlates with lower breakdown rate across the season.
Frequency of Plays Ran	Shares most common formations, sets, actions, and plays that opponents run against OU throughout the season.
Breakdown-to-Score Conversion Rate	Percentage of defensive breakdowns that actually result in opponent scores versus successful recoveries/help.
Action Stacking Effect	Comparison of PPP allowed on possessions with 1 action versus 2 actions versus 3+ actions.
Screen Volume Effectiveness	Identifies at what number of screens per possession your navigation rate collapses (e.g., 85% navigation on 1-2 screens but only 60% on 3+ screens).
Breakdown Rate by Designation	Season-long breakdown percentage when each designation (Blue/Green/Black) is involved in the breakdowns.
Most Exploited Action Type	The action type with the highest opponent PPP and highest frequency run against OU across the season.
Shot Quality Allowed by Designation	Average contest level (Open/Contested/Heavy Contest) for each designation across the season.
In-Game Adaptation	Breakdown percentage in Q1-Q2 compared to Q3-Q4 across all games. Shows how the defense adjusts to opponent plays as the game progresses.
Paint Touch Rate by Action Type	Types of actions that result in the most paint touches over the course of the season.
Shot Frequency by Designation	Percentage of total opponent shots taken by Blue/Green/Black players across the season.
Breakdown Rate by Action	The Breakdown Rate by action that result in the most quality shots (Lightly Contested or Open).
Opponent Offensive Creativity Index	Average percentage of unscouted plays shown per game across the season. Shows if you're facing predictable opponents or adaptive offenses that adjust game-to-game.

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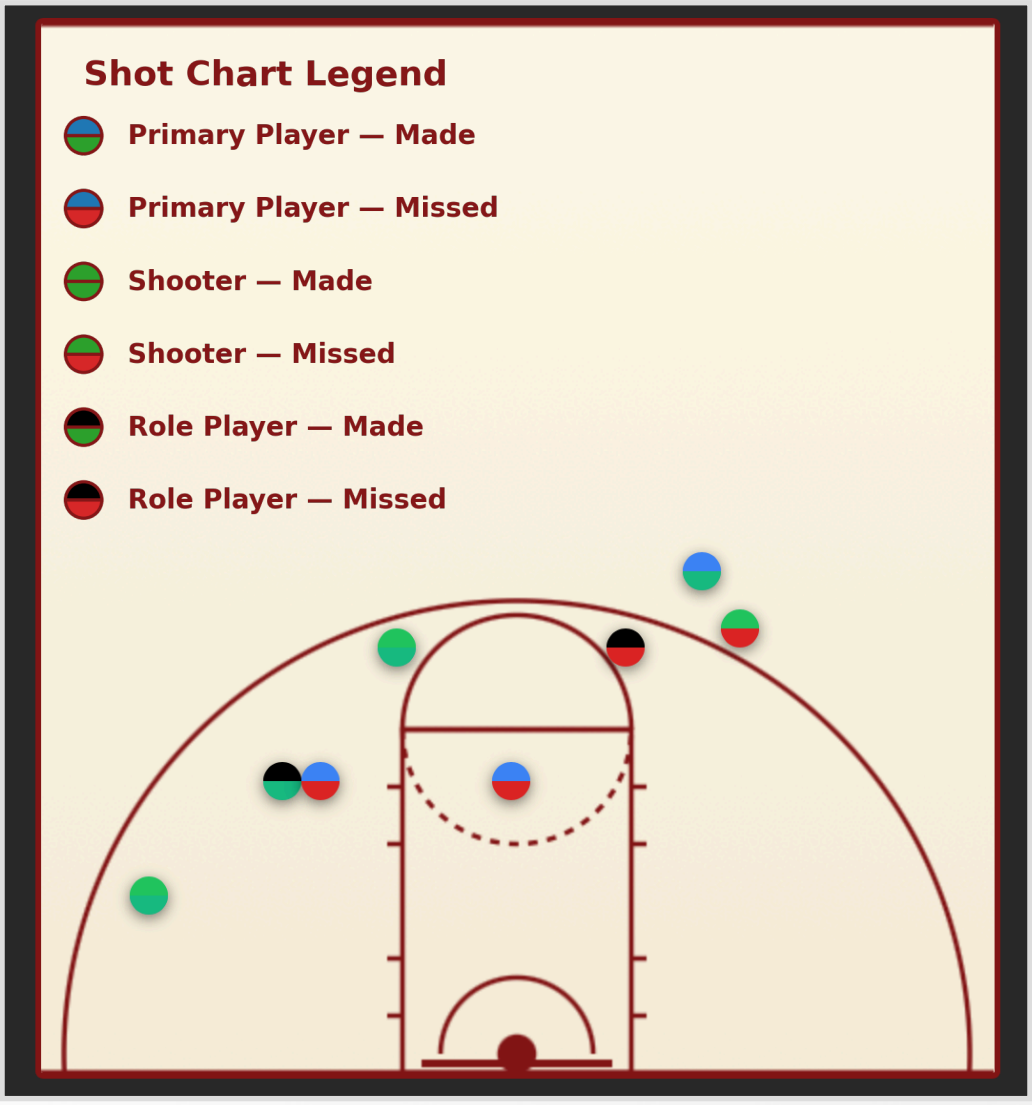
FUTURE DEVELOPMENTS

Shot Chart Model

Using python I started the process of building a shot chart model that visualizes every shot defended with color-coded outcomes based on Player Designation—Blue (Primary Player), Green (Shooter), and Black (Role Player). Each shot is represented by a half-circle marker on the court, with one half indicating the player designation and the other half showing the result (green for made shots, red for misses). This allows for quick visual identification of where different types of players are scoring against OU's defense and the effectiveness of contest levels in different areas of the court. Future progress will integrate filters by opponent, coverage type, and play type to enable deeper pattern analysis.



[Shot Chart Model]

FUTURE DEVELOPMENTS

Statistical Testing & Modeling

As the dataset grows beyond 10-20 games, correlation and regression analyses will be implemented to identify relationships between coverage types, contest levels, and possession outcomes or points. Statistical modeling will determine which factors most significantly predict stops, breakdowns, offensive rebounding, or other factors. This approach will validate which defensive qualities and coverage choices directly influence results.

Expanded Metrics & Reports

Once enough data is tagged, I'll look to create an Expected Points Value (EPV) based on contest level, shot location, and shooter designation. I can also look at more granular metrics like Stuck on Screen (SOS%) percentages. Expanding to include opponent scouting reports could help identify plays before tagging, summarizing trends, and highlighting the most effective coverages against that opponent's top actions.

Potential Future Developments

- Tracking on-court communication (identifying audible calls picked up on broadcast audio)
- Automated clip cutter recognition using OCR synced with game clock timestamps
- Predictive scouting machine learning model based on opponent tendencies
- SEC scouting library cataloging scoring patterns and breakdown triggers
- Advanced visualization dashboards (Begin to learn Tableau or Power BI)

LIMITATIONS & SUMMARY

Limitations

- Tagging process is still mainly manual.
- Sample size can’t always reveal reliable trends, especially for play types that aren't ran often.
- ESPN play-by-play data can contain errors or missing entries that affect the automated defensive possession filter.
- Some tagging categories involve subjective judgment calls that could vary.

Summary

This defensive analytics system will provide insight into OU Women's Basketball's defensive execution by tracking not just outcomes, but how and why defensive possessions succeed or fail. By tagging each defensive possession with specific play calls, action types, defensive coverages, and more, the goal is to identify useful metrics that aren't easily measurable through platforms like Synergy or Hudl. Examples include Breakdown Rate by both complete play type and specific action type, the difference in shot quality between plays prepared for in scout versus unscouted plays, and screen coverage/navigation metrics to identify where breakdowns occur. The workflow integrates film tagging, automated Excel exports, and clip generation to create a complete process that transforms film into information. Throughout the season, the process will also help me better learn and identify plays and actions.