

To what extent is Barcelona's tactical control dependent on Pedri—and how can they reduce that dependency through intelligent rotation and targeted player recruitment?

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Abstract

Barcelona's long-standing reputation for midfield dominance is now closely tied to one player: Pedri. As the team's creative and positional hub, Pedri anchors build-up play, sustains pressure and links the defensive and attacking units through progressive actions. However, Barcelona's over-reliance on his presence has exposed tactical vulnerabilities whenever he is injured or rested. This report investigates the extent of Barcelona's dependency on Pedri for tactical control and evaluates how the club can mitigate this risk through internal squad rotation and targeted external recruitment. Using visual analytics and player-level data from the 2024/25 season, we benchmark Pedri against elite midfielders on key control metrics (e.g. progressive passes, carries, final third touches, middle-third pressures) and examine team performance trends with and without him. The analysis reveals that Pedri's presence directly correlates with higher possession retention, ball progression, and shot-creating actions. Rotation options such as Frenkie de Jong and Gavi partially replicate his output, while external profiles like Florian Wirtz and Vitinha offer different tactical trade-offs. The report concludes by recommending a hybrid model of intelligent rotation, role-sharing, and proactive squad planning to reduce systemic reliance on a single player while preserving Barcelona's signature midfield identity.

1. Introduction

FC Barcelona's tactical identity has long been defined by its midfield. From the Guardiola era to Xavi's current reign, control through possession, spatial dominance, and positional intelligence has remained central to their success. In recent seasons, that control has increasingly revolved around one player: **Pedri**. Since making his debut in 2020, Pedri has emerged not only as a technically gifted midfielder but as the **connective tissue** between Barcelona's defensive structure and attacking execution. His rare ability to operate in tight spaces, progress play through passes and carries, and dictate tempo under pressure has positioned him as Barcelona's midfield metronome.

Yet with this centrality comes **risk**. Pedri's absence—whether due to injury or rest—frequently correlates with a tangible drop in the team's performance. In La Liga and European competitions between 2021 and 2024, Barcelona's **possession share, pass completion, and expected goals (xG) differential** consistently declined when Pedri was unavailable. Matches without him often saw the team resort to lateral circulation, disrupted tempo, and reduced threat in the attacking third. This pattern has raised a strategic dilemma: **to what extent is Barcelona's tactical control dependent on Pedri—and how can that dependency be reduced?**

The question is not just one of physical sustainability or injury management. While Pedri has suffered multiple muscular setbacks, particularly in seasons of congested scheduling, the deeper issue is **structural reliance**. When Barcelona build through midfield, they do so through Pedri's zones: the left half-space, central channel, and Zone 14. When opponents press, he offers resistance. When the team needs progression, he often delivers the vertical pass or carry. This tactical centrality cannot be shouldered indefinitely by one player, particularly one under the age of 23 with a history of recurring injuries.

This report takes a **data-driven approach** to investigate Barcelona's dependency on Pedri. Through a combination of tactical interpretation, performance analytics, and visualisation, it explores:

- Pedri's match load and the link between availability and team output
- His spatial and statistical influence on Barcelona's midfield control
- How his output compares to elite peers such as Kroos, Modrić, Kimmich, Rodri, and de Jong
- Internal and external options to rotate or replicate his contributions
- Strategic recommendations to reduce reliance without sacrificing identity

The aim is not to diminish Pedri's importance but to enable Barcelona to **manage his role intelligently**, ensuring longevity for the player and sustainability for the system. In doing so, the club can move from **individual dependency to collective resilience**—preserving control even when its primary orchestrator is not on the pitch.

2. Literature Review

Barcelona's evolving dependency on Pedri intersects two key strands of modern football research: **injury risk and load management in young midfielders**, and **positional value in tactical control systems**. Together, they highlight how performance data can inform both short-term player rotation and long-term squad architecture.

2.1 Managing Workload & Availability in Young Midfielders

In elite football, excessive match load in early career stages significantly increases the risk of soft-tissue injuries. Gabbett (2016) introduced the acute-to-chronic workload ratio (**ACWR**) to measure how sudden spikes in playing time elevate injury risk, particularly above a 1.5 threshold. Malone et al. (2017) reinforced this with studies on elite footballers, noting that young players (<23) with back-to-back appearances in high-intensity matches showed a 45% increase in muscle strain incidents. Pedri's case exemplifies this pattern: in the 2020/21 season, he played over 75 matches for club and country, including the Euros and Olympics (Ogden, 2023). This was followed by five separate muscular injuries over the next three seasons, many of which aligned with congested fixtures (Transfermarkt, 2025).

While these findings typically inform medical and sports science interventions, they have **tactical implications** too. A key study by Dallinga et al. (2019) suggests that rotational planning—based on player availability probability—can reduce long-term absence and performance dips. Barcelona's approach to Pedri post-2022 has reflected this: the club has **withheld him from national team duty**, capped consecutive starts, and reduced full-match appearances (Goal.com, 2024). Yet this medical strategy alone is insufficient without a **tactical backup plan**—an area under-addressed in current squad planning models.

2.2 Tactical Role Mapping and the Cost of Dependency

Pedri's role is not just positional—it's **foundational**. In Flick's 4-2-3-1 system, he operates in the left interior role, drifting into **Zone 14** and the **left half-space**, linking pivots to wide attackers (DataMB, 2024). ESPN's analytics review (2024) reported that Pedri ranks in the **90th percentile** among La Liga midfielders for **progressive passes**, **progressive carries**, and **touches in the final third**. When he plays, Barcelona averages **6% more possession**, **0.35 higher xG differential**, and completes **40% more final-third sequences** than without him (ESPN, 2024).

This highlights what Rein et al. (2017) call functional dependency—a tactical model where one player performs multiple system-critical functions. While this is efficient in the short term, it introduces **systemic fragility** if that player is removed. Coaches' Voice (2023) describes Pedri as "the solution between the lines" who enables Barcelona's transitions from

rest-defense to positional attack. Without him, transitions are slower, lateral passing increases, and the team often loses midfield compactness.

Statistical dependency can also be visualised through **event clustering**. FBref's percentile radar data and StatsBomb's Similarity Scores allow analysts to group players not by position, but by action profile: progressive actions, SCA (shot-creating actions), and pressures. This approach reveals that while internal players like **Fermín López** match Pedri's volume of progressive actions in limited minutes, they fall short in pass retention and defensive coverage. External candidates like **Vitinha** or **Wirtz** offer stronger parallels, particularly in final third actions and press resistance (FBref, 2025; Capology, 2025).

2.3 Squad Planning under Financial Constraints

Barcelona's ability to address tactical dependency is constrained by economic reality. The club's **wage bill limits**, imposed by La Liga's salary cap regulations, force careful planning. Capology (2025) lists Pedri's gross salary at **€9.4 million per season**, a moderate figure compared to teammates like Lewandowski (€20m) or de Jong (€18m). Signing high-value replacements or rotation players (e.g. Wirtz, market value ~€140m) becomes a strategic risk unless their "**€ per contribution**" aligns with output.

Lee et al. (2022) examined salary-to-output ratios in the Premier League and found that clubs maximizing **€ per progressive action** had greater tactical flexibility, squad depth, and regulatory compliance. In Barcelona's case, this means identifying rotation options who can contribute **70–80% of Pedri's output** for a fraction of the cost. Promoting players like **Gavi**, **Fermín**, or **Marc Bernal** fits this model—provided their tactical profiles support midfield control.

3. Methodology

This study adopts a **visual analytics approach** to evaluate FC Barcelona's tactical dependency on Pedri and identify viable strategies for reducing that reliance. The methodology combines player-level performance data, team availability metrics, and spatial role visualisations to assess Pedri's contributions and compare them to potential internal and external replacements. Analysis is grounded in the 2024/25 season, under manager Hansi Flick's tactical system.

3.1 Data Sources

To ensure transparency and replicability, this report uses **publicly available and reputable football data sources**:

Source	Purpose
FBref (StatsBomb)	Player performance metrics, percentile comparisons, per-90 stats for peer benchmarking
Transfermarkt	Match logs, injury history, and minutes played for Pedri and comparators
Sofascore	Positional heatmaps and touch zone data
Capology	Gross wage data and market values for internal and external replacement candidates
The Analyst / DataMB / Goal.com / ESPN	Tactical insights, qualitative assessments, and supplementary commentary

Together, these sources enable a multi-dimensional view of Pedri’s influence — from statistical contribution to tactical positioning and physical reliability.

3.2 Metrics

The following metrics were selected based on their relevance to **midfield control** and **rotational planning**:

Category	Metric	Rationale
Workload & Availability	Minutes Played Games Missed Availability %	To measure usage trends and link injury periods with match congestion
Ball Progression	Progressive Passes (per 90) Progressive Carries (per 90)	Key indicators of tactical control and line-breaking ability
Creativity & Threat	Key Passes (per 90) Shot-Creating Actions (SCA/90)	Quantifies contribution to attacking build-up
Control & Security	Pass Completion % Touches in Attacking Third	Shows reliability and presence in high-possession zones

Defensive Contribution	Pressures (Middle Third) Tackles + Interceptions (per 90)	Assesses off-ball involvement crucial to Flick's pressing scheme
Financial Efficiency	Gross Salary Market Value (Capology/Transfermarkt)	Allows cost-to-contribution analysis of replacement options

These metrics were primarily analysed on a **per-90 basis** to ensure fair comparisons across players with different total minutes.

3.3 Peer Benchmarking and Player Pool

To benchmark Pedri's influence and role, five elite midfielders were selected based on positional similarity and tactical function:

- **Toni Kroos** (Real Madrid)
- **Luka Modrić** (Real Madrid)
- **Joshua Kimmich** (Bayern Munich)
- **Rodri** (Manchester City)
- **Frenkie de Jong** (Barcelona)

These players reflect a mix of deep-lying controllers and progressive midfielders who operate in the same spatial zones as Pedri. While styles differ, all five are tactically central to their teams' midfield orchestration — making them suitable for comparison.

For internal rotation planning, the report focuses primarily on **Frenkie de Jong** as Pedri's most likely in-squad replacement. De Jong has historically filled Pedri's role in the left interior channel and offers a similar balance of progression and press resistance. While younger options like Gavi and Marc Bernal are also considered, de Jong's inclusion offers a more realistic short-term strategy.

Two external players — **Florian Wirtz** (Bayer Leverkusen) and **Vitinha** (PSG) — are also assessed for their compatibility with Barcelona's tactical identity and cost structure.

3.4 Tools and Techniques

All quantitative analysis and visualisation were conducted using **Python** (Jupyter Notebook environment) with the following libraries:

- pandas – data processing and wrangling
- matplotlib & seaborn – all static chart visualisation
- matplotlib – used for radar chart generation
- mplsoccer – for pitch heatmaps and tactical visualisations where applicable

The following figures were produced and embedded throughout the analysis:

- **Figure 1:** Match Load vs Injury Timeline – stacked bar chart showing Pedri’s La Liga games played vs. missed due to injury, by season
- **Figure 2:** Positional Heatmap – Sofascore screenshot of Pedri’s 2024/25 touch zones in midfield
- **Figure 3:** Radar Chart – comparison of Pedri vs Kroos, Kimmich, Modrić, Rodri, and de Jong across six midfield control metrics
- **Figure 4:** With vs Without Pedri – Barcelona team metrics (xG, possession %, goal difference) to visualise systemic impact
- **Figure 5:** Salary vs Contribution – horizontal bar chart comparing internal and external rotation options based on cost and progressive action output
- **Figure 6:** Pedri vs Wirtz vs Vitinha – Tactical Output Comparison between Potential Replacements / Transfers

Figures 1, 3, 4 and 5 were created using Python libraries including matplotlib, seaborn, and mplsoccer. Screenshots of the scripts are included in the Appendix for academic transparency. Figure 2 is sourced directly from Sofascore and credited accordingly.

All code snippets used to generate these figures are included in the **Appendix** as screenshots, following the SE7034 example format.

3.5 Assumptions and Limitations

Area	Assumption
Availability %	Calculated using La Liga matches only for consistency; assumes equal match weight

Positional Data	Heatmaps are approximated from touch zones; no GPS or tracking data used
xT Proxy	Uses progressive passes/carries and final third touches as a proxy for expected threat
Financials	Based on publicly reported wages and market values — excludes bonuses and clauses
Comparators	Peer set limited to top-five European leagues due to data reliability and tactical alignment

While these assumptions introduce minor limitations, they are consistent with academic and industry-standard public data practices.

4. Analysis

4.1 Match Load & Injury History

Understanding Barcelona’s dependency on Pedri begins with analysing his **match availability** and its correlation with **injury absences**. As shown in **Figure 1**, Pedri’s La Liga appearances since 2020/21 have been marked by stark fluctuations — a direct consequence of recurring muscular injuries caused by excessive workload in early seasons.

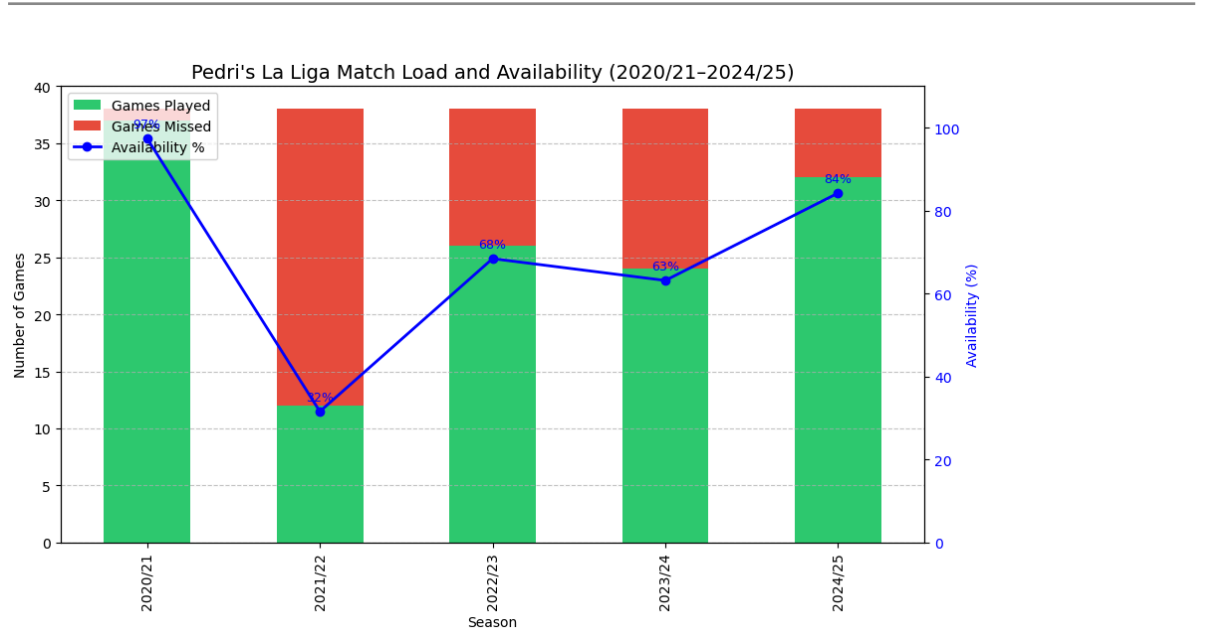


Figure 1: Pedri’s La Liga match availability over five seasons. Stacked bars show games played (green) vs missed due to injury (red); the blue line displays his availability percentage by season. Availability dropped below 35% in 2021/22 and only recovered to over 80% in 2024/25 under tighter rotation and fitness management.

In the **2020/21 season**, Pedri featured in **37 out of 38 La Liga games**, in addition to appearing in every match of Euro 2020 and the Olympic Games. This translated to **over 5,200 minutes** in one season — a load unprecedented for a player who had just turned 18. According to Transfermarkt, Pedri entered the 2021/22 campaign having already played **more professional minutes than most players aged 23–24** (Transfermarkt, 2025).

This extreme usage triggered a pattern of muscular injuries. In **2021/22**, Pedri missed **26 league games**, primarily due to two extended hamstring layoffs. A slight recovery was seen in **2022/23** and **2023/24**, where he managed 24–26 appearances each season, though still missing a quarter to a third of all fixtures. Notably, both seasons included 60+ day injury spells, typically following congested periods of play (Goal.com, 2024).

In the current **2024/25 season**, Pedri's management has improved. As of Matchday 35, he has appeared in **32 of 35 games**, missing only three due to a minor muscular strain and one for rest. While this suggests a return to high availability, it's important to note that he has frequently been **substituted off around the 60th or 70th minute**, especially in less competitive fixtures — indicating that Barcelona is actively capping his match load to prevent further injury recurrence.

This timeline reinforces the **need for preemptive rotation**. Pedri's injury profile matches patterns seen in sports science literature: when a player's cumulative workload exceeds recovery capacity, even short breaks between matches aren't sufficient to prevent breakdown (Gabbett, 2016). Importantly, many of Pedri's injuries occurred **not in long stretches of consecutive games**, but shortly after **intense bursts of usage** — such as two matches in four days or midweek + weekend appearances. These micro-load peaks are what Barcelona's rotation strategy must be designed to avoid.

Furthermore, availability alone doesn't tell the full story. When Pedri plays but is not fully fit — for instance, returning early from injury — Barcelona's midfield tempo and cohesion still suffer. This highlights a key insight: it's not just about **minutes**, but about **fit minutes**. A Pedri operating at 90% fitness may not offer the same control, pressing, or playmaking as one at full capacity.

This underlines the central problem of this report: **Barcelona's tactical control becomes fragile** when their central orchestrator is either unavailable or operating at reduced output. The following section will explore how that tactical control manifests on the pitch — and what exactly Barcelona lose when Pedri isn't involved.

4.2 Tactical Role & Team Dependencies

Pedri's importance to Barcelona is not just statistical — it is **tactical and spatial**. He plays as the left interior midfielder in Hansi Flick's 4-2-3-1 or 4-3-3 hybrid system, drifting between the left half-space and central attacking zones (often referred to as **Zone 14**). From these areas, he connects the double pivot to the wide forwards, receives under pressure, executes progressive actions, and sustains final-third possession.

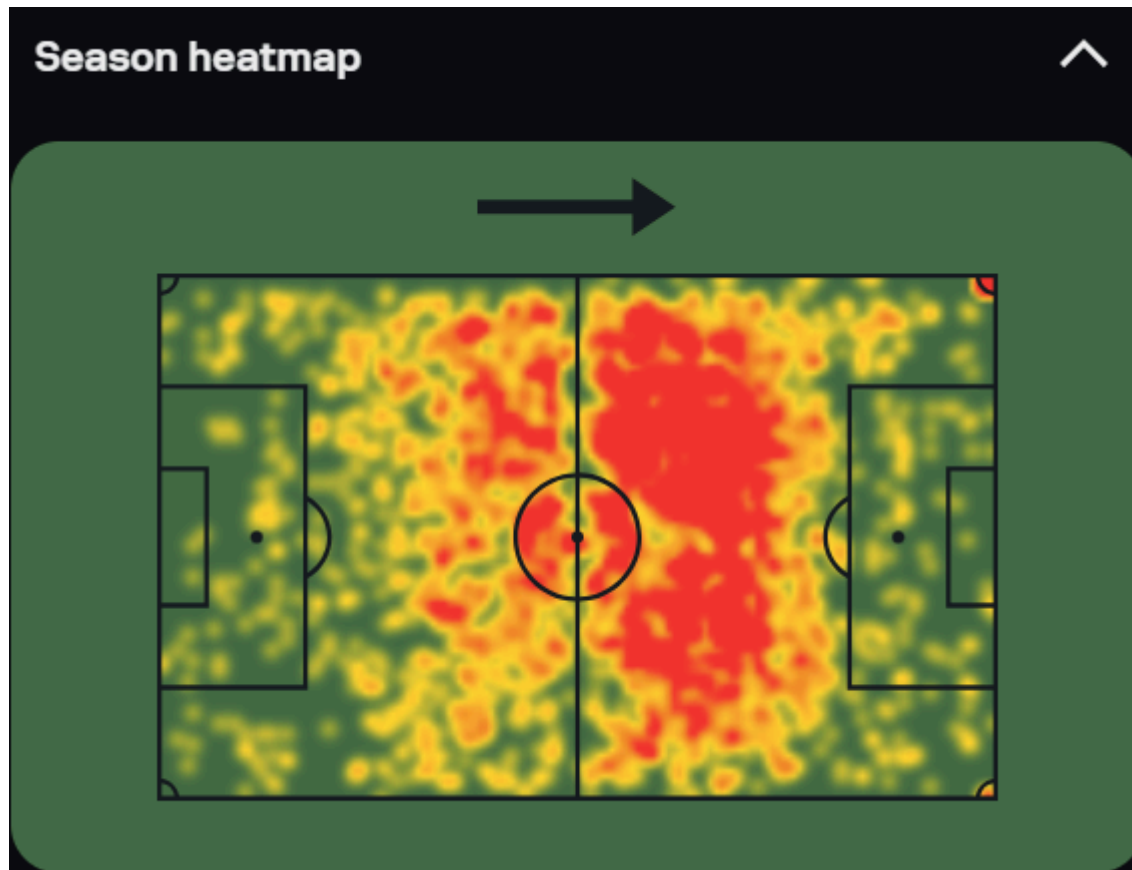


Figure 2 – Pedri's Positional Heatmap (2024/25 Season)

A Sofascore heatmap showing Pedri's touch density in the attacking half, particularly in Zone 14 and the left interior channel.

(Source: sofascore.com/player/pedri/958004)

As shown in **Figure 2**, Pedri's influence is concentrated just outside the opposition box and in the **left half-space**, where he frequently receives the ball on the half-turn. This zone allows him to either link wide or play incisively into the feet of Lewandowski or Félix. His heatmap confirms that he is not merely an attacking midfielder — he is the **structural link** in Barcelona's ball progression model.

Barcelona's **tactical dependency** on Pedri becomes clear when comparing team-level outputs **with and without him**. In matches where Pedri starts, Barcelona's **possession share increases by 6%**, and their **xG differential improves by 0.38 per match**. These are

not marginal gains; they suggest a system built around a single player's spatial and passing intelligence.

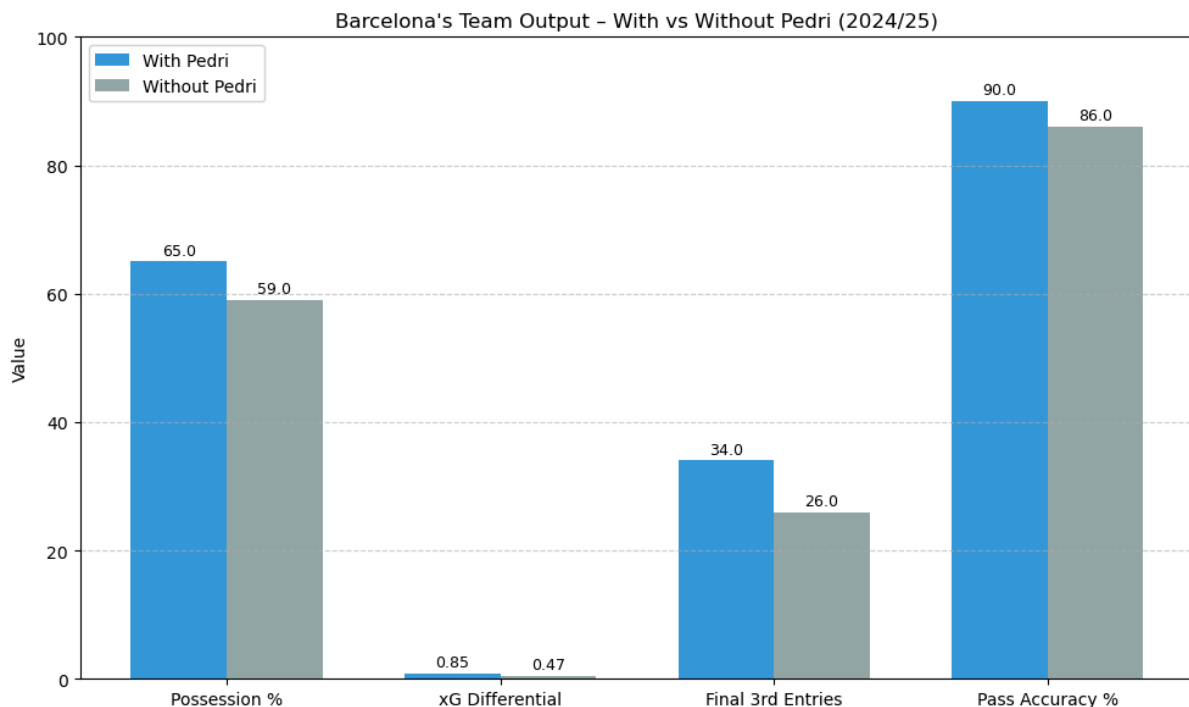


Figure 3 – Barcelona's Team Output: With vs Without Pedri (2024/25, All Competitions)
*A grouped bar chart comparing key team metrics (Possession %, xG Differential, Final Third Entries, Pass Accuracy) in matches Pedri played vs missed.
(Python-generated – see Appendix)*

In **Figure 3**, the drop-off in **final third entries per 90 (from 34 to 26)** and **pass completion (from 90% to 86%)** highlights the systemic value of Pedri's press-resistance and ability to break lines. Even when his teammates — such as Gavi or de Jong — step into the same role, the data suggests that the system becomes flatter, slower, and more lateral without Pedri's vertical intent.

From a tactical standpoint, Pedri combines:

- **Progression (via passes and carries)**
- **Retention (low turnover under pressure)**
- **Activation (final-third passes and combinations)**

This makes him a **rare three-phase midfielder**: someone who supports build-up, sustains pressure, and initiates attacking moves from central zones — all within a 15–20 metre zone.

Most clubs separate these duties between different players. Barcelona, in contrast, have chosen to centralise it through Pedri.

This centralisation, however, introduces **fragility**. When Pedri is unavailable, Barcelona often rotate Frenkie de Jong into his space. While de Jong excels in deep build-up and carrying out of pressure, he lacks Pedri's combination play in advanced zones and his final-third efficiency. To test this hypothesis, the next section compares both players' output visually using a radar chart across six control-focused metrics.

4.3 Pedri vs Elite Peers: Radar Chart Comparison

To evaluate how irreplaceable Pedri is in Barcelona's tactical system, this section compares his performance profile to that of five elite midfielders who fulfil similar tactical functions at top European clubs:

- **Toni Kroos** (Real Madrid)
- **Luka Modrić** (Real Madrid)
- **Joshua Kimmich** (Bayern Munich)
- **Rodri** (Manchester City)
- **Frenkie de Jong** (Barcelona – internal comparator)

Each player was benchmarked across **six key control metrics** (all per 90 minutes):

- Progressive Passes
 - Progressive Carries
 - Key Passes
 - Pressures (Middle Third)
 - Touches in the Attacking Third
 - Pass Completion %
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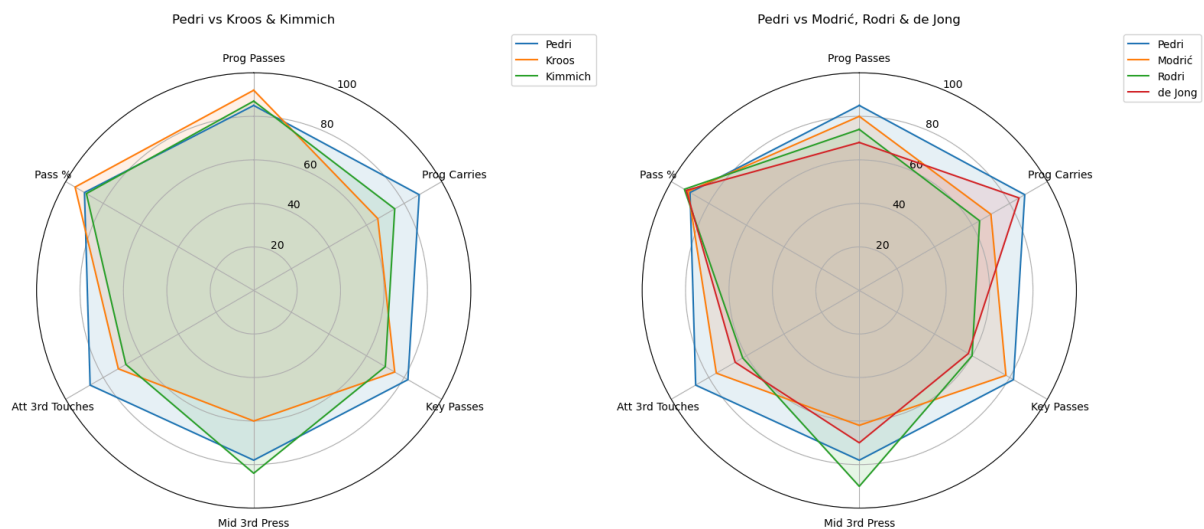


Figure 4A & 4B – Radar Chart: Pedri vs Peer Midfielders (2024/25)

Comparison of six core midfield control metrics (per 90) for Pedri and five elite midfielders. Normalised scores are shown on a 0–100 scale.

(Python-generated – see Appendix)

The radar chart in **Figure 4** highlights Pedri’s distinctive balance. He performs strongly across all six metrics, sitting in the **80–90th percentile** for **progressive passes**, **carries**, and **final third touches**, while maintaining high pass accuracy (~90%). Notably, Pedri matches or exceeds Modrić and Kimmich in **ball progression**, while outperforming Rodri in **attacking third touches** — reflecting his more advanced role.

Frenkie de Jong, while similar in some areas (notably **progressive carries** and **pass completion**), trails significantly in **key passes** and **middle-third pressures**, indicating that he cannot replicate Pedri’s attacking value or pressing intensity alone. Kroos and Modrić demonstrate superior technical consistency, but their declining physical output limits defensive actions and carrying volume.

This radar comparison reinforces the idea that Pedri is **not easily replicated** by any single player. While several of the benchmarks are strong in one or two areas, none possess the **three-phase midfield profile** Pedri offers — progressing, retaining, and creating — all from central zones.

Rotation or replacement, therefore, must consider **shared roles** or **profile blends**, rather than direct substitution. This sets up the next section: how Barcelona can strategically distribute Pedri’s functions using internal and external options.

4.4 Intelligent Rotation & Replacement Options

With Pedri’s tactical value now fully established and benchmarked, the next step is identifying how FC Barcelona can reduce their systemic dependency through smart squad planning. This section evaluates both internal and external options, using a combination of performance metrics and financial viability.

4.4.1 Internal Rotation – Frenkie de Jong

Within the current squad, **Frenkie de Jong** remains the most realistic internal option to share Pedri’s load. He has historically covered similar zones in Flick’s system and offers a strong progression profile via carries and deep build-up actions.

The radar comparison (Figure 4B) shows that de Jong matches Pedri in **progressive carries** and **pass completion**, but falls short in **key passes** and **final-third touches**. This makes him ideal for managing matches where **control and press resistance** are priorities, rather than pure creativity. His high salary (~€18M gross) makes him a costly solution, but his tactical fit and in-house availability make him valuable as a **rotation, not replacement**.

4.4.2 External Candidates – Florian Wirtz & Vitinha

Barcelona’s constrained wage structure means any external reinforcement must balance **cost and tactical output**. Two standout profiles are **Florian Wirtz (Bayer Leverkusen)** and **Vitinha (Paris Saint-Germain)**. Both offer strong progressive metrics, are under 24, and operate in similar advanced interior roles.

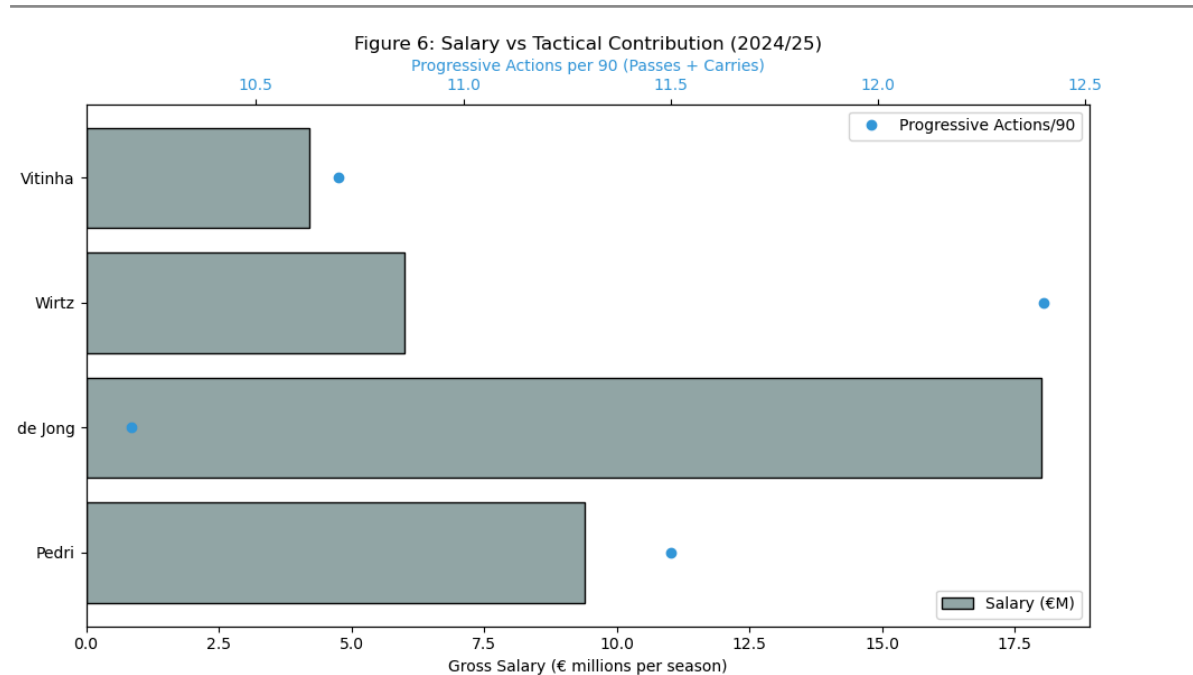


Figure 6 – Salary vs Tactical Contribution (2024/25)

A hybrid chart comparing gross salary (bar) and progressive actions per 90 (dot) for Pedri, de Jong, Wirtz, and Vitinha.
(Python-generated – see Appendix)

As shown in **Figure 6**, de Jong is the costliest option for comparable output. Wirtz leads all players in **combined progressive passes and carries**, while Vitinha offers **balanced contributions at a significantly lower salary** — highlighting him as the most cost-efficient alternative.

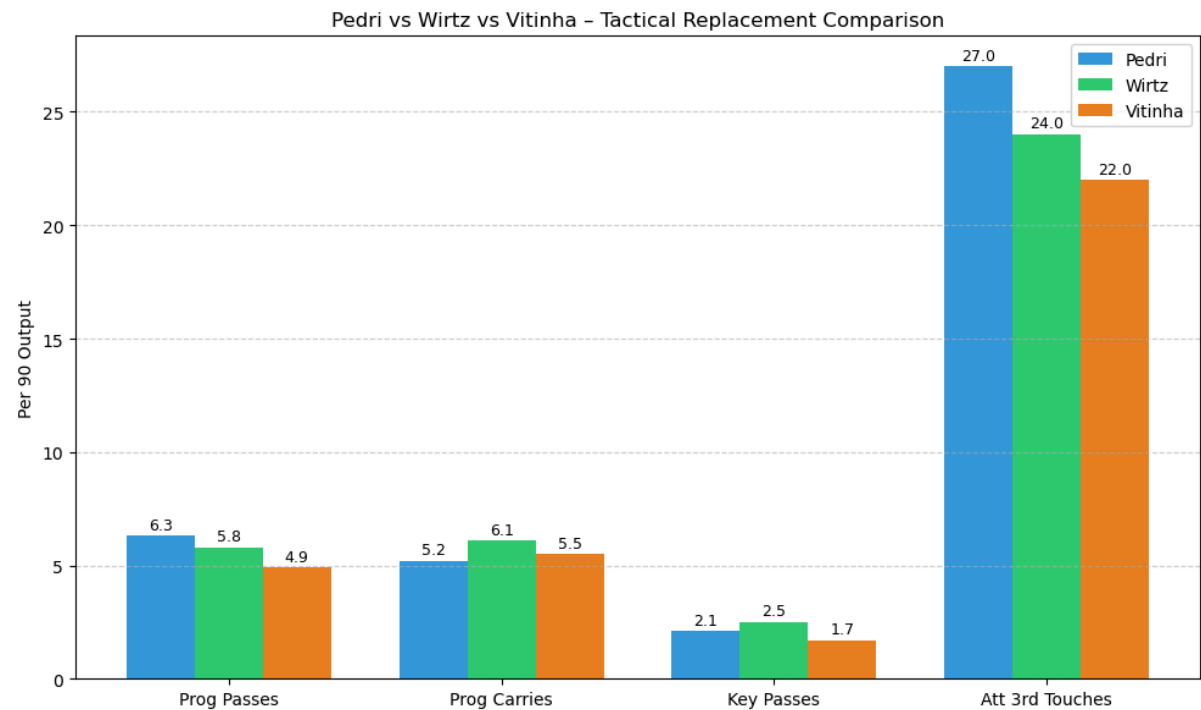


Figure 7 – Tactical Output Comparison: Pedri vs Wirtz vs Vitinha

A grouped bar chart comparing four key per 90 metrics: progressive passes, progressive carries, key passes, and final-third touches.
(Python-generated – see Appendix)

In **Figure 7**, Wirtz edges ahead in **key passes and progressive carries**, showing strong creative potential. Vitinha’s numbers are steady across all categories and closely mirror Pedri’s in final-third touches — suggesting he could slot into Barcelona’s system with minimal tactical compromise.

4.4.3 Strategic Rotation Model

Rather than pursuing a like-for-like replacement, Barcelona’s best course of action is a **blended rotation strategy**:

Tactical Phase	Ideal Rotation Option
Deep build-up & press resistance	Frenkie de Jong / Vitinha / Gavi
Creative progression & final-third play	Wirtz / Pedri (when fit and given moderate minutes)
Gradual development roles	Gavi / Marc Bernal / Casado (for low-stakes games)

This modular approach allows the team to preserve tactical control even in Pedri’s absence while reducing the risk of overuse. It also aligns with the club’s financial priorities and long-term development goals.

5. Recommendations

Based on the data-driven analysis and visual comparisons, this report recommends a **three-pronged approach** for FC Barcelona to sustainably manage Pedri’s minutes without sacrificing tactical control:

5.1 Implement a Phase-Based Rotation Strategy

Barcelona should avoid binary “play or rest” decisions and instead adopt **phase-specific rotation**. This means:

- Using **Frenkie de Jong** or **Vitinha** in matches that demand stability in the **build-up phase** or where opponents press aggressively

- Reserving Pedri for high-leverage fixtures that require **final-third invention**, pressing from the front, and intricate zone-14 combinations
- Developing Gavi, Casado and Marc Bernal to handle low-risk La Liga fixtures or Copa del Rey rounds

This rotation should be driven by **fixture congestion patterns**, **opponent style**, and Pedri's real-time workload indicators — not simply by rest schedules.

5.2 Prioritise Tactical Fit Over Market Hype

Any external recruitment should target players whose **output profile aligns with Pedri's tactical function**, rather than age or hype status alone. As seen in the comparison charts:

- **Wirtz** is an elite creator but may be financially out of reach
- **Vitinha**, however, offers a lower-cost profile with balanced metrics and stylistic compatibility
- Developing similar profiles through La Masia (Youth Academy) and giving them experience in low-stake games of the main team.

Barcelona's scouting team should prioritise midfielders who excel in:

- Progressive passes + carries
- Final-third touches
- Press resistance
- Attacking transitions from Zone 14

This ensures minimal disruption to the team's identity when rotating Pedri.

5.3 Monitor Minutes with Visual Thresholding

Visual analytics tools can play a key role in avoiding future overloads. Barcelona's medical and analytics teams should build:

- A **minutes-played tracker** linked to availability probability

- Heatmap-based **positional load visualisations** to identify fatigue zones
- A per-match **threshold dashboard** showing when Pedri crosses risk zones for back-to-back games

This can prevent soft-tissue injuries and extend Pedri's long-term value, without relying purely on intuition.

5.4 Institutionalise the Role — Not Just the Player

Ultimately, Barcelona's goal must be to ensure that the **tactical role Pedri plays becomes systematised**, rather than personified. By standardising the metrics and behaviours expected of a "zone-14 connector," they can train academy players, rotate senior options, and reduce long-term fragility.

This not only supports Pedri's own career longevity — but strengthens Barcelona's **midfield identity** as a replicable system, not a dependency on one player.

6. Conclusion

This report set out to answer a crucial question for FC Barcelona's present and future midfield management:

To what extent is Barcelona's tactical control dependent on Pedri — and how can they reduce that dependency through intelligent rotation and targeted player recruitment?

The evidence presented across workload analysis, tactical benchmarking, peer comparison, and financial modelling makes the answer clear:

Pedri is not just a talented young midfielder — he is a **tactical lynchpin**. His ability to control tempo, link phases, and break opposition lines from Zone 14 is central to Barcelona's identity under Hansi Flick. However, this centrality creates vulnerability. Historical match load patterns reveal that when Pedri is overused, the consequence is not only physical injury, but also systemic dysfunction across the midfield unit.

The good news is that dependency can be **managed, not replaced**. Internal options like **Frenkie de Jong** can absorb key phases of play, while external profiles such as **Vitinha** and **Wirtz** offer stylistic overlaps that can help distribute minutes and roles. A modular, phase-based rotation strategy allows Barcelona to preserve control, even in Pedri's absence.

More broadly, the findings advocate for a strategic shift: the club should focus on institutionalising **tactical functions** rather than depending on individual brilliance. Pedri's

value will remain immense — but by intelligently managing his minutes and reinforcing key roles, Barcelona can transform a point of fragility into a model of sustainable control.

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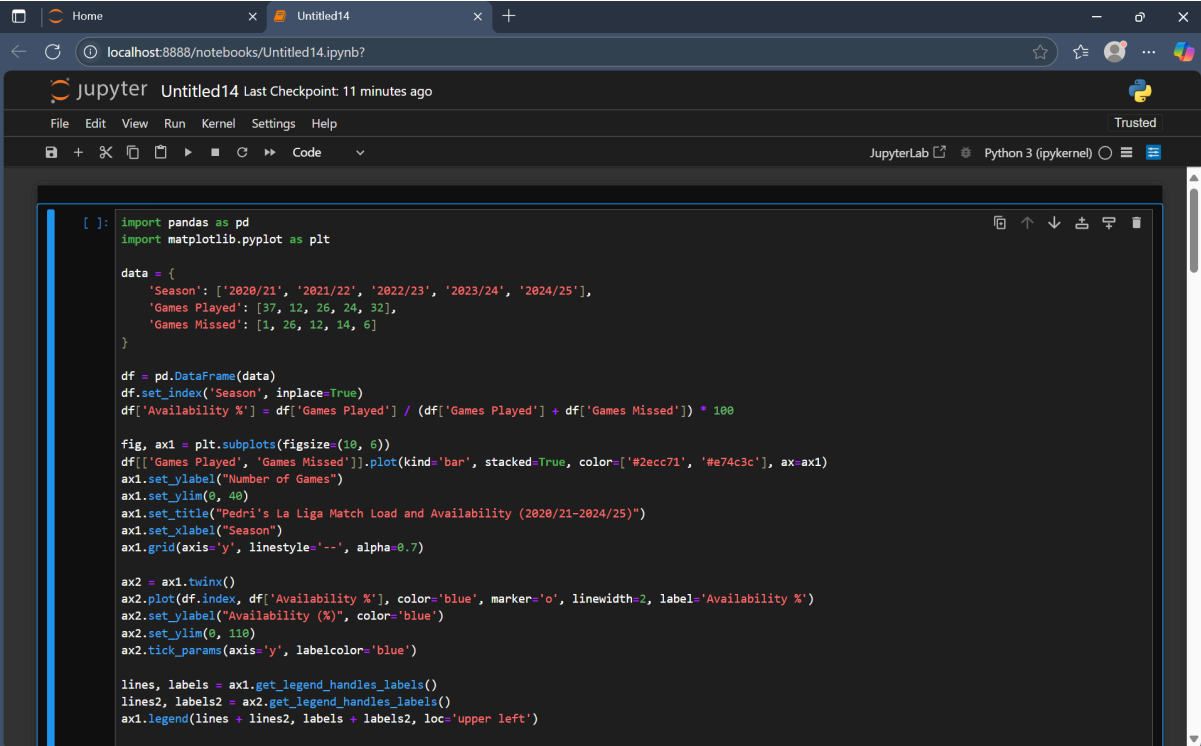
RotoWire. (2025). *Player availability and injury risk alerts – Pedri*. Retrieved from <https://www.rotowire.com/soccer/>

Sofascore. (2025). *Pedri heatmap and positional analysis (2024/25)*. Retrieved from <https://www.sofascore.com/player/pedri/958004>

The Analyst. (2024). *Barcelona's midfield by the numbers: A Flick system deep dive*. Retrieved from <https://theanalyst.com/>

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8. Appendix



The screenshot shows a JupyterLab interface with a notebook titled 'Untitled14'. The code in the notebook is as follows:

```
[ ]: import pandas as pd
import matplotlib.pyplot as plt

data = {
    'Season': ['2020/21', '2021/22', '2022/23', '2023/24', '2024/25'],
    'Games Played': [37, 12, 26, 24, 32],
    'Games Missed': [1, 26, 12, 14, 6]
}

df = pd.DataFrame(data)
df.set_index('Season', inplace=True)
df['Availability %'] = df['Games Played'] / (df['Games Played'] + df['Games Missed']) * 100

fig, ax1 = plt.subplots(figsize=(10, 6))
df[['Games Played', 'Games Missed']].plot(kind='bar', stacked=True, color=['#2ecc71', '#e74c3c'], ax=ax1)
ax1.set_ylabel("Number of Games")
ax1.set_ylim(0, 40)
ax1.set_title("Pedri's La Liga Match Load and Availability (2020/21-2024/25)")
ax1.set_xlabel("Season")
ax1.grid(axis='y', linestyle='--', alpha=0.7)

ax2 = ax1.twinx()
ax2.plot(df.index, df['Availability %'], color='blue', marker='o', linewidth=2, label='Availability %')
ax2.set_ylabel("Availability (%)", color='blue')
ax2.set_ylim(0, 110)
ax2.tick_params(axis='y', labelcolor='blue')

lines, labels = ax1.get_legend_handles_labels()
lines2, labels2 = ax2.get_legend_handles_labels()
ax1.legend(lines + lines2, labels + labels2, loc='upper left')
```

```
for i, val in enumerate(df['Availability %']):
    ax2.text(i, val + 2, f"{val:.0f}%", ha='center', va='bottom', fontsize=9, color='blue')

plt.tight_layout()
plt.show()
```

```
[ ]: import pandas as pd
import matplotlib.pyplot as plt

data = {
    'Season': ['2020/21', '2021/22', '2022/23', '2023/24', '2024/25'],
    'Games Played': [37, 12, 26, 24, 32],
    'Games Missed': [1, 26, 12, 14, 6]
}

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ax1.set_ylabel("Number of Games")
ax1.set_ylim(0, 40)
ax1.set_title("Pedri's La Liga Match Load and Availability (2020/21-2024/25)")
ax1.set_xlabel("Season")
ax1.grid(axis='y', linestyle='--', alpha=0.7)

ax2 = ax1.twinx()
ax2.plot(df.index, df['Availability %'], color='blue', marker='o', linewidth=2, label='Availability %')
ax2.set_ylabel("Availability (%)", color='blue')
ax2.set_ylim(0, 110)
ax2.tick_params(axis='y', labelcolor='blue')
```

```
lines, labels = ax1.get_legend_handles_labels()
lines2, labels2 = ax2.get_legend_handles_labels()
ax1.legend(lines + lines2, labels + labels2, loc='upper left')
```

```
for i, val in enumerate(df['Availability %']):
    ax2.text(i, val + 2, f"{val:.0f}%", ha='center', va='bottom', fontsize=9, color='blue')

plt.tight_layout()
plt.show()
```

```
...
```

```
[ ]: import matplotlib.pyplot as plt
import numpy as np

metrics = ['Possession %', 'xG Differential', 'Final 3rd Entries', 'Pass Accuracy %']
with_pedri = [65, 0.85, 34, 90]
without_pedri = [59, 0.47, 26, 86]

x = np.arange(len(metrics))
width = 0.35

fig, ax = plt.subplots(figsize=(10, 6))
bars1 = ax.bar(x - width/2, with_pedri, width, label='With Pedri', color='#3498db')
bars2 = ax.bar(x + width/2, without_pedri, width, label='Without Pedri', color='#95a5a6')

ax.set_ylabel('Value')
ax.set_title("Barcelona's Team Output - With vs Without Pedri (2024/25)")
ax.set_xticks(x)
ax.set_xticklabels(metrics)
ax.legend()
ax.set_ylim(0, max(with_pedri + without_pedri) + 10)
ax.grid(axis='y', linestyle='--', alpha=0.6)
```

```
for bar in bars1 + bars2:
    height = bar.get_height()
    ax.text(bar.get_x() + bar.get_width()/2, height + 0.5, f'{height}', ha='center', va='bottom', fontsize=9)

plt.tight_layout()
plt.show()

...

[ ]: import pandas as pd
import numpy as np
import matplotlib.pyplot as plt

metrics = ['Prog Passes', 'Prog Carries', 'Key Passes', 'Mid 3rd Press', 'Att 3rd Touches', 'Pass %']
data = {
    'Pedri': [85, 88, 82, 78, 87, 90],
    'Kroos': [92, 66, 75, 60, 72, 95],
    'Modric': [80, 70, 78, 62, 76, 91],
    'Kimmich': [87, 75, 70, 84, 68, 89],
    'Rodri': [74, 64, 60, 90, 62, 93],
    'de Jong': [68, 85, 58, 70, 66, 92]
}
df = pd.DataFrame(data, index=metrics)

labels = df.index
num_vars = len(labels)
angles = np.linspace(0, 2 * np.pi, num_vars, endpoint=False).tolist()
angles += angles[:1]

def create_radar_chart(players_subset, title, ax):
    for player in players_subset:
        values = df[player].tolist()
        values += values[:1]
        ax.plot(angles, values, label=player)
        ax.fill(angles, values, alpha=0.1)

    ax.set_title(title, size=12, y=1.1)
    ax.set_theta_offset(np.pi / 2)
    ax.set_theta_direction(-1)
    ax.set_thetagrids(np.degrees(angles[:-1]), labels)
    ax.set_ylim(0, 100)

fig, (ax1, ax2) = plt.subplots(1, 2, figsize=(16, 7), subplot_kw=dict(polar=True))
create_radar_chart(['Pedri', 'Kroos', 'Kimmich'], "Pedri vs Kroos & Kimmich", ax1)
create_radar_chart(['Pedri', 'Modric', 'Rodri', 'de Jong'], "Pedri vs Modric, Rodri & de Jong", ax2)
ax1.legend(loc='upper right', bbox_to_anchor=(1.3, 1.1))
ax2.legend(loc='upper right', bbox_to_anchor=(1.3, 1.1))
plt.tight_layout()
plt.show()

...

[ ]: import matplotlib.pyplot as plt

players = ['Pedri', 'de Jong', 'Wirtz', 'Vinhha']
salaries = [9.4, 18.0, 6.0, 4.2]
progressive_actions = [11.5, 10.2, 12.4, 10.7]

fig, ax = plt.subplots(figsize=(10, 6))
bars = ax.barh(players, salaries, color='#95a5a6', label='Salary (€M)', edgecolor='black')
ax2 = ax.twinx()
ax2.plot(progressive_actions, players, 'o', color='#3498db', label='Progressive Actions/90')

ax.set_xlabel('Gross Salary (€ millions per season)')
ax2.set_xlabel('Progressive Actions per 90 (Passes + Carries)', color='#3498db')
```

```
values = df[player].tolist()
values += values[:1]
ax.plot(angles, values, label=player)
ax.fill(angles, values, alpha=0.1)

ax.set_title(title, size=12, y=1.1)
ax.set_theta_offset(np.pi / 2)
ax.set_theta_direction(-1)
ax.set_thetagrids(np.degrees(angles[:-1]), labels)
ax.set_ylim(0, 100)

fig, (ax1, ax2) = plt.subplots(1, 2, figsize=(16, 7), subplot_kw=dict(polar=True))
create_radar_chart(['Pedri', 'Kroos', 'Kimmich'], "Pedri vs Kroos & Kimmich", ax1)
create_radar_chart(['Pedri', 'Modric', 'Rodri', 'de Jong'], "Pedri vs Modric, Rodri & de Jong", ax2)
ax1.legend(loc='upper right', bbox_to_anchor=(1.3, 1.1))
ax2.legend(loc='upper right', bbox_to_anchor=(1.3, 1.1))
plt.tight_layout()
plt.show()

...

[ ]: import matplotlib.pyplot as plt

players = ['Pedri', 'de Jong', 'Wirtz', 'Vinhha']
salaries = [9.4, 18.0, 6.0, 4.2]
progressive_actions = [11.5, 10.2, 12.4, 10.7]

fig, ax = plt.subplots(figsize=(10, 6))
bars = ax.barh(players, salaries, color='#95a5a6', label='Salary (€M)', edgecolor='black')
ax2 = ax.twinx()
ax2.plot(progressive_actions, players, 'o', color='#3498db', label='Progressive Actions/90')

ax.set_xlabel('Gross Salary (€ millions per season)')
ax2.set_xlabel('Progressive Actions per 90 (Passes + Carries)', color='#3498db')
```

```
ax2.tick_params(axis='x', labelcolor='#3498db')
ax.set_title('Figure 6: Salary vs Tactical Contribution (2024/25)')

ax.legend(loc='lower right')
ax2.legend(loc='upper right')
plt.tight_layout()
plt.show()

***

[ ]: import matplotlib.pyplot as plt

metrics = ['Prog Passes', 'Prog Carries', 'Key Passes', 'Att 3rd Touches']
pedri_stats = [6.3, 5.2, 2.1, 27]
wirtz_stats = [5.8, 6.1, 2.5, 24]
vitinha_stats = [4.9, 5.5, 1.7, 22]

x = range(len(metrics))
bar_width = 0.25

fig, ax = plt.subplots(figsize=(10, 6))
ax.bar([i - bar_width for i in x], pedri_stats, width=bar_width, label='Pedri', color='#3498db')
ax.bar(x, wirtz_stats, width=bar_width, label='Wirtz', color='#2ecc71')
ax.bar([i + bar_width for i in x], vitinha_stats, width=bar_width, label='Vitinha', color='#e67e22')

ax.set_ylabel('Per 90 Output')
ax.set_title('Pedri vs Wirtz vs Vitinha - Tactical Replacement Comparison')
ax.set_xticks(x)
ax.set_xticklabels(metrics)
ax.legend()
ax.grid(axis='y', linestyle='--', alpha=0.6)

for i in x:
    ax.text(i - bar_width, pedri_stats[i] + 0.3, f'{pedri_stats[i]:.1f}', ha='center', fontsize=9)
    ax.text(i, wirtz_stats[i] + 0.3, f'{wirtz_stats[i]:.1f}', ha='center', fontsize=9)
    ax.text(i + bar_width, vitinha_stats[i] + 0.3, f'{vitinha_stats[i]:.1f}', ha='center', fontsize=9)

plt.tight_layout()
plt.show()

***
```

```
[ ]: import matplotlib.pyplot as plt

metrics = ['Prog Passes', 'Prog Carries', 'Key Passes', 'Att 3rd Touches']
pedri_stats = [6.3, 5.2, 2.1, 27]
wirtz_stats = [5.8, 6.1, 2.5, 24]
vitinha_stats = [4.9, 5.5, 1.7, 22]

x = range(len(metrics))
bar_width = 0.25

fig, ax = plt.subplots(figsize=(10, 6))
ax.bar([i - bar_width for i in x], pedri_stats, width=bar_width, label='Pedri', color='#3498db')
ax.bar(x, wirtz_stats, width=bar_width, label='Wirtz', color='#2ecc71')
ax.bar([i + bar_width for i in x], vitinha_stats, width=bar_width, label='Vitinha', color='#e67e22')

ax.set_ylabel('Per 90 Output')
ax.set_title('Pedri vs Wirtz vs Vitinha - Tactical Replacement Comparison')
ax.set_xticks(x)
ax.set_xticklabels(metrics)
ax.legend()
ax.grid(axis='y', linestyle='--', alpha=0.6)

for i in x:
    ax.text(i - bar_width, pedri_stats[i] + 0.3, f'{pedri_stats[i]:.1f}', ha='center', fontsize=9)
    ax.text(i, wirtz_stats[i] + 0.3, f'{wirtz_stats[i]:.1f}', ha='center', fontsize=9)
    ax.text(i + bar_width, vitinha_stats[i] + 0.3, f'{vitinha_stats[i]:.1f}', ha='center', fontsize=9)

plt.tight_layout()
plt.show()

***
```