

# TODAY Sports

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High 15°C Low 7°C 5h of  
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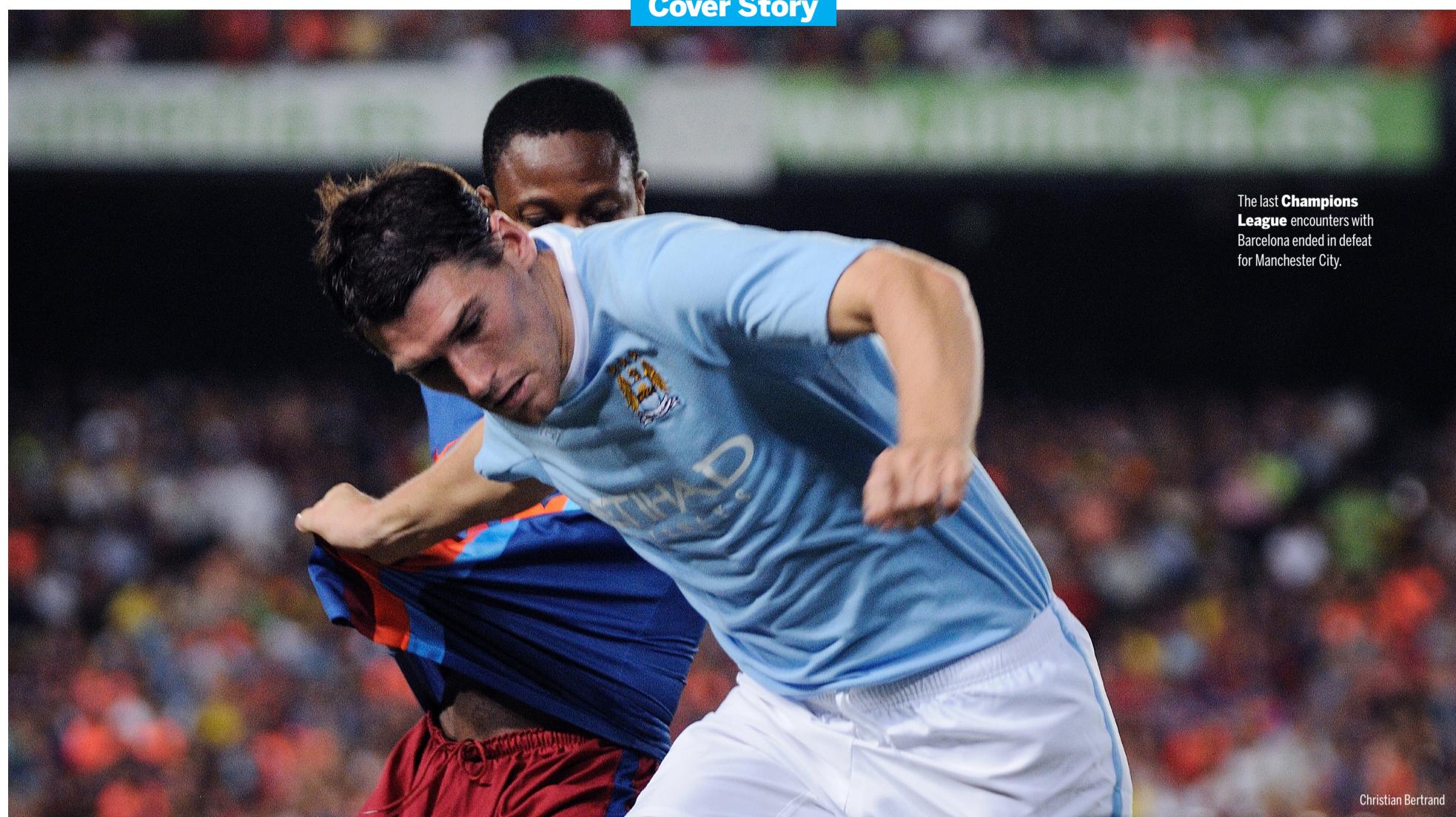
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## Cover Story



The last **Champions League** encounters with Barcelona ended in defeat for Manchester City.

Christian Bertrand

# CL showdown pits digital smarts against old school nous

By Walker Evans - London

Walking toward the tunnel at Old Trafford at the final whistle last Saturday, Frank de Boer's was the face of a man feeling vindicated. After an uninspiring end to last season, his is a ship that increasingly looks not only righted, but one charging into the wind at full sail, at least on paper. And yet, when his undefeated Manchester City host Barcelona tonight at the Etisalat Stadium, it's the Dutchman who may feel under the most pressure, despite looking superior on paper against his old Catalan side, itself in the midst of a revamp.

Having satisfied hardcore fans by completing the double over United – and early in the season due to an odd fixture calendar – he heads into the semifinal against a fighting fit Barcelona tonight with something to prove: that he isn't just the front-man for City's new owners IBM and their bootroom laboratory for experimental tactics that puts silicon before good old fashioned nous. This accusation – that he is only a sockpuppet for a supercomputer and a new breed of bootroom boffins with no feel for the

beautiful game – has increasingly leveled by rank-and file supporters glad to have the wins, but bored to tears by the occasionally incomprehensible technical play of the side. Where de Boer once was an acolyte of attractive *totaalvoetbal*, three months spent in Qatar at brother Ronald's new programme at IBM's Sport Institute in Doha seems to have changed his approach entirely. As the head of City's main supporter group Mark Porter recently put it, "Winning pretty or winning ugly – both are fine, but winning soullessly isn't a good strategy for the long-term."

While de Boer needs to play along to bring returns on the big investment his paymasters at the Etisalat have made in the controversial overhaul, his comments to journalists over the past month suggest a man with something to prove. The implications of his complaints, first caught by a hot mic from BT Sport, are that his pride is taking a bit of a beating as tactical and selection decisions for the Sky Blues are rigidly doled out from the fifteen-person "data squad" put in place following the controversial sale of the team by Sheik Mansour to Big Blue last December.

That decision, which led to the sack-

ings of the entire technical staff and subsequent resignation of Roberto Martinez, put enormous pressure on de Boer to both prove his own value as incoming manager, and at the same time, deliver on the unprecedented commercial partnership that many traditionalists say is a bridge too far for a game already troubled by accusations it has lost contact with its roots in England.

## The Catalan Restoration

By contrast, Barcelona's resurrection under Xavi after three dismal seasons by local standards finishing fourth, third and just being pipped to the post last season by Valencia—is being credited to the restoration he has led on the field and on the training pitch. Xavi's return to a Guardiola-esque tiki-taka, with the relentless pressing and flowing movement, has put some beauty back into the side's performances, and is bringing supporters back to the Camp Nou even as City fans are turning away from their team's mechanical performances.

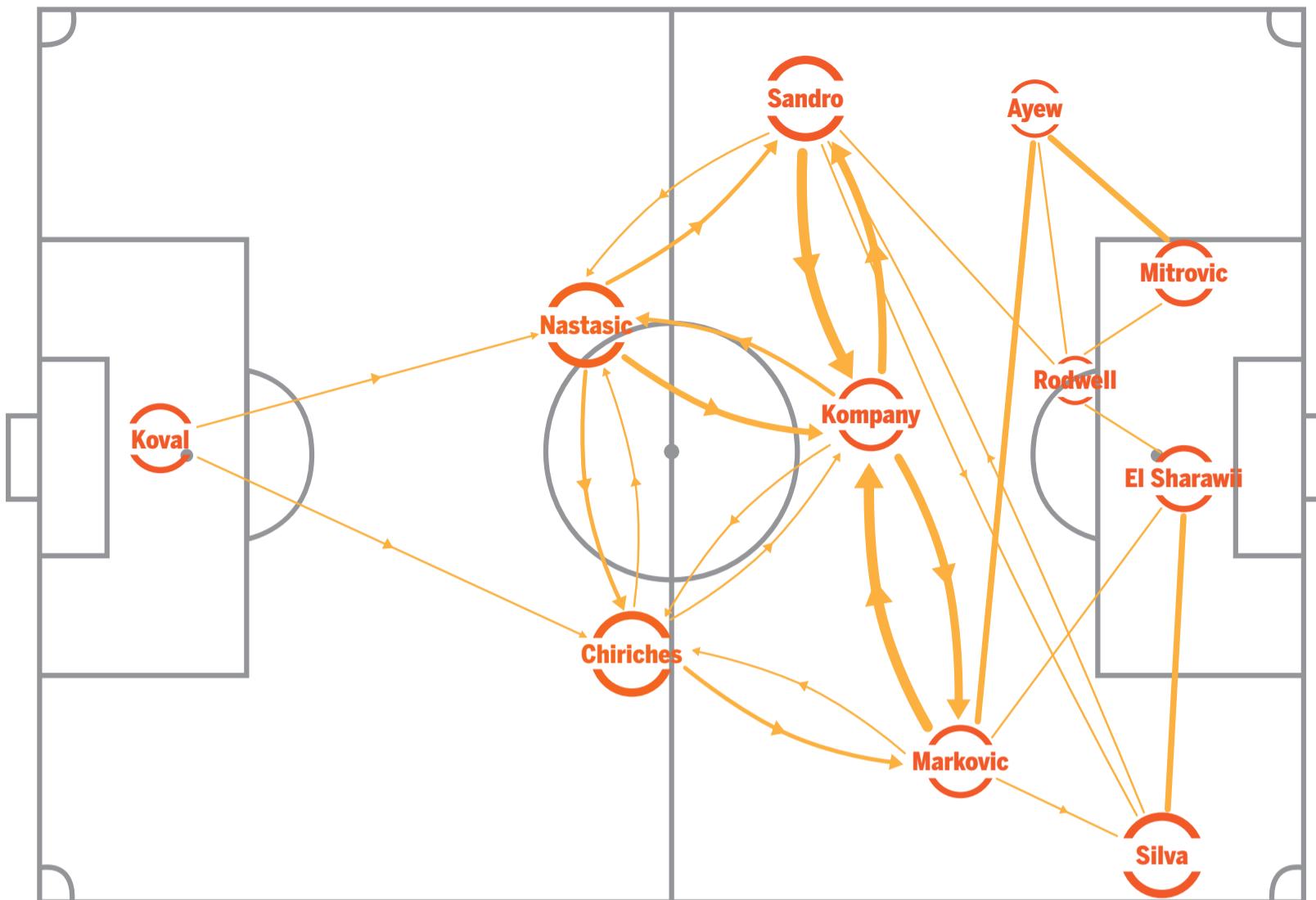
All of which sets the table for an enticing match tomorrow night—City's unusual, seemingly random, computer-

generated play versus the drilled but attractive old school approach of the blaugrana which has also yielded an undefeated record in La Liga and the Champion's League thus far. *Marca* has derisively labelled the coming semifinal tie "Men vs. the Machine," casting Xavi's men in the role of England's 19th century Luddite uprising of loom-busters who fought—unsuccessfully—industrialization of the country's mills, adding "this time the fight is for something of ultimate importance: the preservation of football as we've known it for over a century. This time, the counter-revolutionaries must finish "the job"

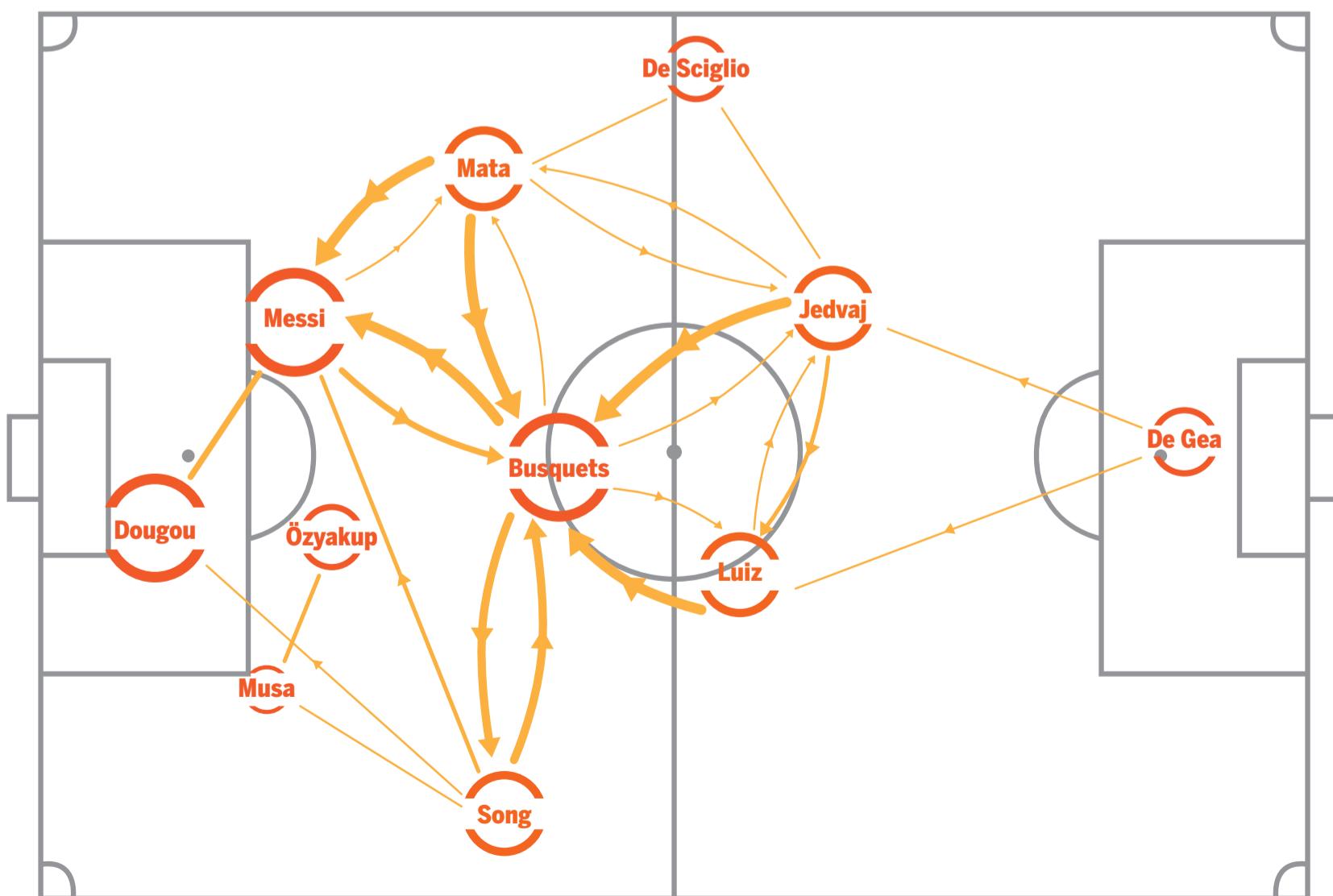
*Marca*'s rhetoric, while meant to provoke at the expense of City (remember, industrialization of the mills started Manchester), it's not wholly an overstatement to suggest tomorrow's match is significant as a metaphorical turning point in modern management. De Boer's success at turning an ailing Spurs around in short order through his defensive but effective style of play has been copied to some success by acolytes and wannabes alike in the past three seasons.

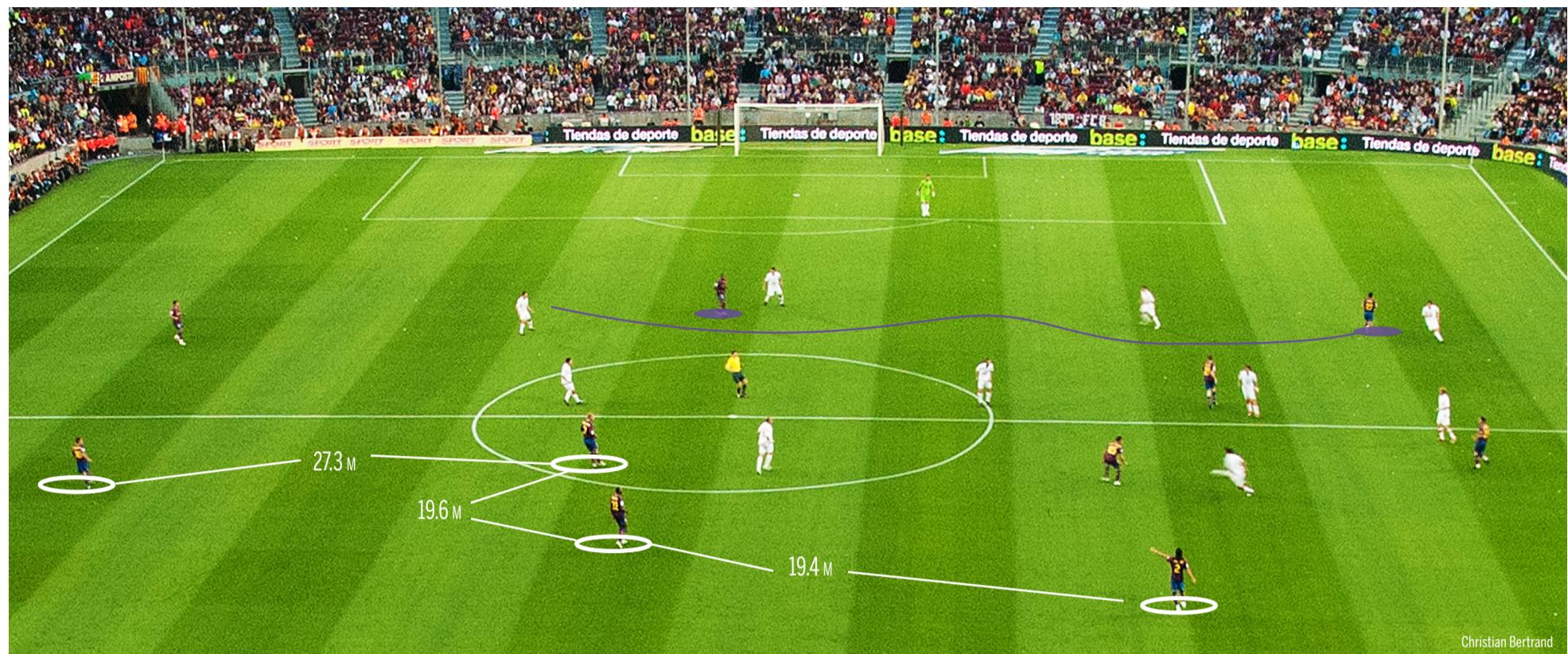
## SYSTEM SNAPSHOTS

System snapshot © Molecular Football

MANAGER:  
**Frank De Boer**SUBSTITUTES:  
Mignolet, Zabaleta,  
Mallo, Touré, Ramirez,  
Lacazette, Jovetic.**The Spinal Trap**  
**Manchester City**

vs

**Perpetual Motion**  
**FC Barcelona**MANAGER:  
**Xavi Hernandez**SUBSTITUTES:  
Fernandez, Giménez,  
Goretka, Albadalejo, Clausi,  
Roberto, Sanchez



Christian Bertrand

# Zugzwang fights to be the new Tiki-Taka

## Football is a game of mistakes and City wins by provoking them.

By Luis Ibañez - London

Football has entered a new era and Manchester City is one of its main ambassadors. The intense pressing and short passing game or "tiki-taka" that Barça and the Spanish *Roja* imposed to the world in the beginning of the decade profoundly transformed the nature of football. But that was then. This is now.

The teams and managers that have applied strategies inherited from Rinus Michels and Johan Cruijff have lost their momentum. The time to think and act has vanished, along with a generation of players with a technical talent as big their lack of intensity and reactivity; the key attribute to thrive in the current football era of speed of execution often associated to the unique skills developed by video game players. Defenders that are not able to properly construct a microstrategy, strikers that play with freedom and trickery, and intuitive but slow playmakers are the losers of an era that probably ended in 2016 when now Barça manager Xavi retired from playing.

Over the last two years, intense pressing has not disappeared, but it is its recent evolution that characterizes today's football. In 2016, Borussia Dortmund, managed by Jürgen Klopp, had probably accomplished its most brilliant season yet. Even if the team failed to win the European trophy, its 32 Bundesliga wins forced Pep Guardiola to resign as Bayern Munich coach, suggesting that Klopp's modern

approach to football was superior. A key decision made was to stop using the "gegenpressing" strategy that Klopp's team of performance analysts had repeatedly warned was too physically demanding for key players, and which led to misguided transfer decisions.

The signing of Zlatan Ibrahimovic in 2015 was a dramatic example of this misalignment between tactics and players. Besides Ibrahimovic's high goal conversion rate, the ability of Dortmund to keep the ball in the opponent's Red Zone had plummeted by 13.2 per cent—Ibrahimovic's inability to maintain the press created costly leaks in defense and enabled counterattacks that offset his stellar Goal Probability Added stat.

The following season, under Ballon d'Or winner Marco Reus, the mechanical system and game philosophy that Klopp introduced gained traction. More importantly, it stoked the minds of fans with the high energy shown by players on the pitch, and since, has changed the way managers in Germany and elsewhere look at tactics in football. Reus's innovation centered around a philosophy that beIN Sport Germany data journalist Sebastian Kehl coined as "Zugzwang", a term taken from chess that literally means "compulsion to move" and describes the helplessness imposed on the rival by relentless pressure, both offensive as well as defensive.

Reus's system has been adapted brilliantly by Champion's League semifinal-

ists Lucien Favre at Bayern Munich and Frank de Boer at Manchester City, and both results and match performance data have objectively proven the effectiveness of Zugzwang football to leave rival teams choked of opportunities to develop their game, and players not a peak fitness exposed. In practice, Zugzwang consists of short bursts of ball possession, no lateral

**Zugzwang,  
a term  
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"compulsion  
to move."**

passing, and a tendency to rapidly "overload" parts of the pitch via the flexibility of a 3-1-2-3-1 system, creating a high density of players in the rival camp that is almost impossible to bypass.

The seminal moment for Zugzwang versus tiki-taka on May 2016 during the German Cup final. During that game, Dortmund kept on seeking throw-ins close to the corner flag in order to set up its offensive net, forcing Bayern's

defence to systematically make bad decisions. Reus, Jakub Blaczkowski and Serge Gnabry perfectly blocked passes between the lines, leaving Guardiola with no tactical alternatives. Loyal to his *Bayerische Walzer*, the German evolution of tiki-taka, Guardiola's long-favored style of play was undone by its very antithesis: an approach to football that refuses the control of the game, does not press the player with the ball, but reduces the empty spaces and blocks all the passing options. The Bavarians were forced to hold up the ball individually, but the space allowed by Dortmund was often too small to move the ball, forcing risky passes and generating turnovers upon which Reus's side capitalized again and again. Bayern defenders Jérôme Boateng and Inigo Martínez, whose failed attempts to pass out of the pressure led directly to two goals, can testify.

Today, Favre is leading Bayern Munich with the most lethal version of Zugzwang. The team is on the verge of qualifying for the Champions League final and is running head to head with Dortmund in Bundesliga. Even though Dortmund lost Klopp after the 2016 Champions League final, Markus Gisdol has carried on his predecessor's heritage with the unique statistical difference of relying more on long distance shots.

Football is a game of mistakes, and along with Borussia Dortmund and Bayern Munich, Manchester City wins games in provoking them through Zugzwang. In his introduction at City, de Boer claimed that "a team that commits errors in no more than 15 to 18 per cent of its actions is unbeatable", echoing a theory developed in the 90s by Dynamo Kiev's data scientist Anatoly Zelentsov. In 2018 empirical evidence proves that the theory still holds strong, thirty years on.

# Big data becomes big investor in football



## TECH-RELATED INVESTMENTS IN FOOTBALL

Investment	Year	Amount	Plans
Larry Page purchase of 65% of Tottenham Hotspur.	2015	£380 MILLION.	Unclear.
Hasso Plattner purchase of 33% of VfB Stuttgart.	2016	Undisclosed. Estimated to be around: £170 MILLION.	Installation of high-tech backroom operations, other plans unclear.
Nick D'Aloiso buyout of Crystal Palace FC.	2016	£67 MILLION.	Rumoured to include development of similar microtactic development as is being trialled at Manchester City, though using different approach, yet to be detailed.
Sergey Brin outright purchase of Zenit St. Petersburg.	2017	Undisclosed. Estimated to be around: £170 MILLION.	Discussions of outfitting players with GlassX, or other augmentation equipment. Also suggestion of forming a Global League to include Zenit as one of 12 breakaway clubs, along with Spurs, Monaco and a handful of others.
IBM purchase of 80% of Manchester City from Sheik Mansour.	2017	Undisclosed. Estimated to be around: £320 MILLION. Possibly not all cash, mixture of tech investment and shares.	Implementation of Watson-centered computer-driven management.
Silent takeover of David Beckham investment in Miami Current.	2018	£32 MILLION.	Players to use Soylent as their primary source of nutrition-outcomes to be measured in real time and performance data reported via Soylent-branded app.
EA Games purchase of 80% of LA Galaxy.	2018	£112 million.	Plan rumoured to be in place to allow fans to "crowdmanage" the Galaxy from 2019-2020 season.

Money from steel, banking or petroleum once bankrolled the game, now dollars, pounds and euros flow from data.

By Luis Ibañez - London

Beyond investments starting in the early 2000s by teams such as Chelsea, Manchesters City and United, Bayern Munich, Dortmund and the two Milans, there is now more software and computing power packed into the back rooms of mid-league sides such as Hoffenheim, Nice, Swansea and Villereal than runs most shops on the Web.

A new cadre of young managers pushing a data-driven approach built on terabytes of player data, tactical variations, weather conditions and individual player nutrition have put the time-honored slow evolution of tactical innovation and coaching philosophies on fast forward.

It's no accident that, on selection last month to be Germany captain for Russia 2018, Hoffenheim defender Stefan Thesker joked that his manager knows more about what he eats than he does. This is not a surprise considering that club boss is not a former player, but a PhD in Sports Data Science from University of Heidelberg and a former data startup wunderkind himself.

One catalyst has been the gradual replacement of oil and commodities money that flowed into the game from the Abramovichs, Mansours, or venture capital from the Glazers and Henrys, by direct investment from the latest round of Silicon Valley titans who have made their money from data. Where once there was money from steel, banking or petroleum bankrolling the game at the highest level, now dollars, pounds and euros flow from data. The big stories have been Larry Page's surprise investment in the Spurs in July of 2015 when he stepped down from Google, fellow Google founder Sergey Brin's investment in Zenit St. Petersburg in late 2016, SAP ex-chairman Hasso Plattner's investment in Stuttgart around the same year, and Yahoo! CEO Nick D'Aloiso's purchase of Crystal Palace at the end of last season.

On an international front, two years ago Iceland's football association began funding vastly upgraded training facilities for the men's and women's national teams using gains from its investment in Auroracoin mining starting in 2013, a move that was widely derided at the time as ridiculous, but which now seems brilliant. The digital mining operation was credited last month with a return of over €16,000,000 alone for the football program, out of a total of over €150,000,000 for broader national investment apportioned by national referendum.

Add to that CEO of food substitute Soylent's buyout of David Beckham's investment in Miami's MLS side to run an experiment in sports nutrition, and EA Games' takeover of the LA Galaxy on behalf of a consortium of gamers this spring, and the nature of football ownership for the sake of technological tinkering has taken a leap ahead.

## By The Numbers

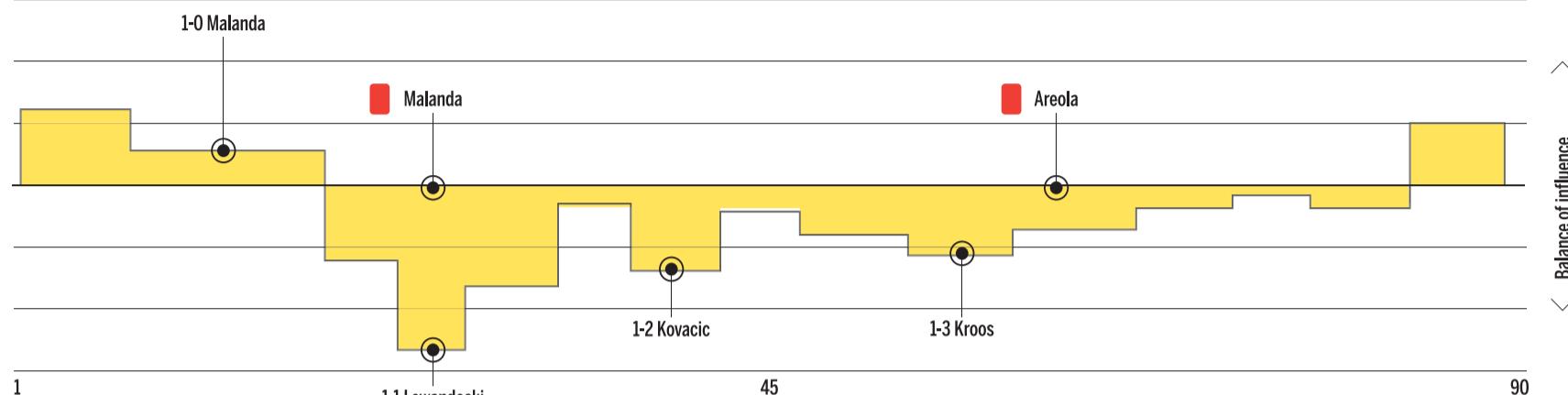
# PSG plays the martyr after loss to Bayern



PARIS SAINT-GERMAIN



BAYERN MUNICH



## Claude Makelele's post game statements will probably lead to a disciplinary measure.

Aimee Laurence – Paris

**"That's an armed robbery!"**  
Makelele said, facing the journalists all alone, he initially seemed to struggle to find words—before blaming the referee, of course.

### 1 GOAL AND 2 BOOKINGS: JUNIOR MALANDA

The evening had started well for the Parisian Armada, thanks to a fortunate goal from the Belgian midfielder Junior Malanda (18th) that could have been largely stopped by Marc-André ter Stegen. Paradoxically, that's when the troubles began for PSG. Warned by a first yellow card for taking his jersey off to celebrate his goal—his fourth for unsporting behaviour this season—Malanda received a second one at the 26th minute after committing a dangerous tackle on the young Levin Öztunali (see our injury report).

Until then, Malanda's was a sound per-

formance, acting as a sort of defensive registra that suited him perfectly, garnering seven short clearances in his own 30 and exerting strong influence in Bayern's 40. His coach blamed Malanda's sending off on overzealousness by referee Sian Massey—on her first selection to officiate a Champions League fixture.

### LUCIEN FAVRE TO TEAM: "GIT'ER DONE"

Thanks to a very well-executed play, the Bavarians took advantage of the free kick to level the game. With a superb chip, Veetle Man of the Match Toni Kroos lofted the ball to Timo Werner, who evaded van der Wiel's marking on the flank. Without a defender within four or five yards, the shooting winger had only one thing left to do: deliver a good cross to Robert Lewandowski, who wrong-footed keeper Alphonse Areola with a gorgeous volley (27th).

The German ogres could not be satisfied with one single away goal, even though it guaranteed odds of qualifying as good as

3.35. With a simple hand gesture—and some shouted instructions—boss Lucien Favre nudged David Alaba into the midfield to create more of a 3-1-2-3-1 shape, thus allowing his team to use its trademark Zugzwang pressing.

As a result of Bayern's relentless press, the Parisians were forced into increasingly risky passing, seeing their possession of the ball erode until half-time, falling by two-third after Bayern's tactical switch. Not surprisingly, PSG were punished by a second goal just when they thought they had made it safely to half time, thanks to a long range shot from Mateo Kovacic (45th+4). To make matters worse, Claude Makelele insisted, with some validity, that Massey should have blown the whistle after two minutes of stoppage time "at the absolute most". This debate, however, paled in comparison to the refereeing blunders during the second half.

### LEWANDOWSKI: STILL A COMPETITIVE DIVER

The second half quickly turned sour for the host team. Lewandowski, through on goal with only the keeper to bear, though nearly offside, took advantage of Areola's strong intervention to take a theatrical tumble in the box (57th). The PSG keeper got red-carded, and Bayern given a penalty kick (59th). Claude Makelele could only repair the damage by sending on his second goalkeeper, 22-year-old Rémi Descamps instead of Antoine Griezmann.

In the meantime Makalele made a more contentious choice by replacing Alessandro Florenzi for the enforcer Kurt Zouma to strengthen the defensive line. Unfortunately Descamps could not do anything about Toni Kroos's penalty. PSG was now led 1-2 at home with only nine men on the pitch, not a common storyline.

### MASSEY LOSES THE PLOT

Fortunately for PSG, the Bavarians backed off the pressure, merely exchanging short passes until the end of the match, averaging a mere 3.75 yards

per pass in the midfield throughout the remainder of the match—death by tiki-taka. The game could have nodded off at this pace, but Bayern's slow tempo game took skill, and was well orchestrated by Javi Martinez in typical form, who almost recorded a triple-double with his eight key passes, nine interceptions and seven tackles.

Despite Bayern's "keep ball" tactic, PSG still tried to maintain some aggressiveness, underlined by "Chucky" Ferreyra's excellent performance after being brought on in the 77th minute, replacing Nemanja Matic. The switch reshaped what was left of PSG into a still offensive-minded 4-2-1-1, a bold if cocky bit of coaching that might have been rewarded if not for Sian Massey missing Ivan Ivanov's obvious handball (81st) and a few minutes later disallowing Carlos Fierro's goal due to a highly questionable offside call (88th).

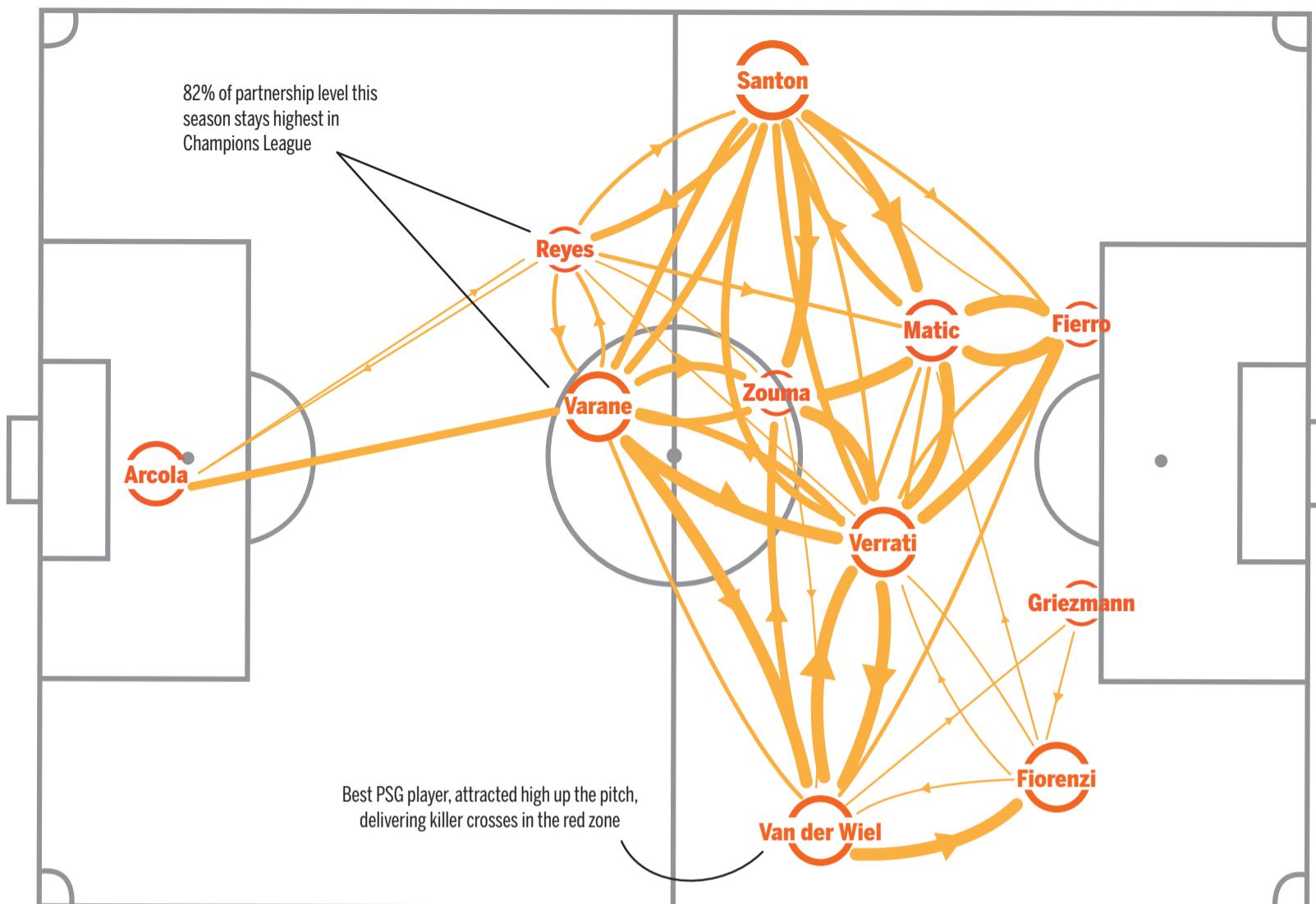
### MAD-KELELE

In the end, this costly defeat leaves a bad taste in the Parisians's mouths. On account of the three goals conceded, their qualifying probability currently sits at only 9%, based on past data. PSG now need a miracle to triumph at the Allianz Arena. Their comeback against Real Madrid in the previous round (4-2 after being down 2-0) at least provides a glimmer of hope, and could be the source of possible tactical ideas.

For the time being, PSG appear to be more focused on pointing out faults in the refereeing, though the numbers say the greater fault perhaps still sits with Makelele and his staff. There is no indication the furor will die down in the coming weeks, fed by waves of online opinion and comments. French fans shouldn't lose sight of the possibility that their team could be able to qualify if they score two goals early. After all, boldness could outweigh data if they can manage to reach their first Champions League Final. This promises to be an incredible second leg.

KEY PERFORMANCE INDICATORS	Paris Saint-Germain	Bayern Munich
<b>OFFENSE</b>		
Shots	7	14
Goal Conversion Rate	14%	21%
Dangerousness	Weakling	Child
Special situations Dangerousness	5	9
Fluidity in own Red Zone	Suitable	Too obvious
Possession in opposite Red Zone	72%	87%
Goal Probability Added	13%	28%
<b>DEFENSE</b>		
Roughness	OMG	Easy-going
Pressing synchronisation	0.4	0.9
Tactical obedience 1st HT	Truancy	Orderly
Tactical obedience 2nd HT	Painstaking	Soldierlike
<b>PHYSICAL</b>		
Seven metres per second sprints	23	35
Sprints recovery	0.9	0.9

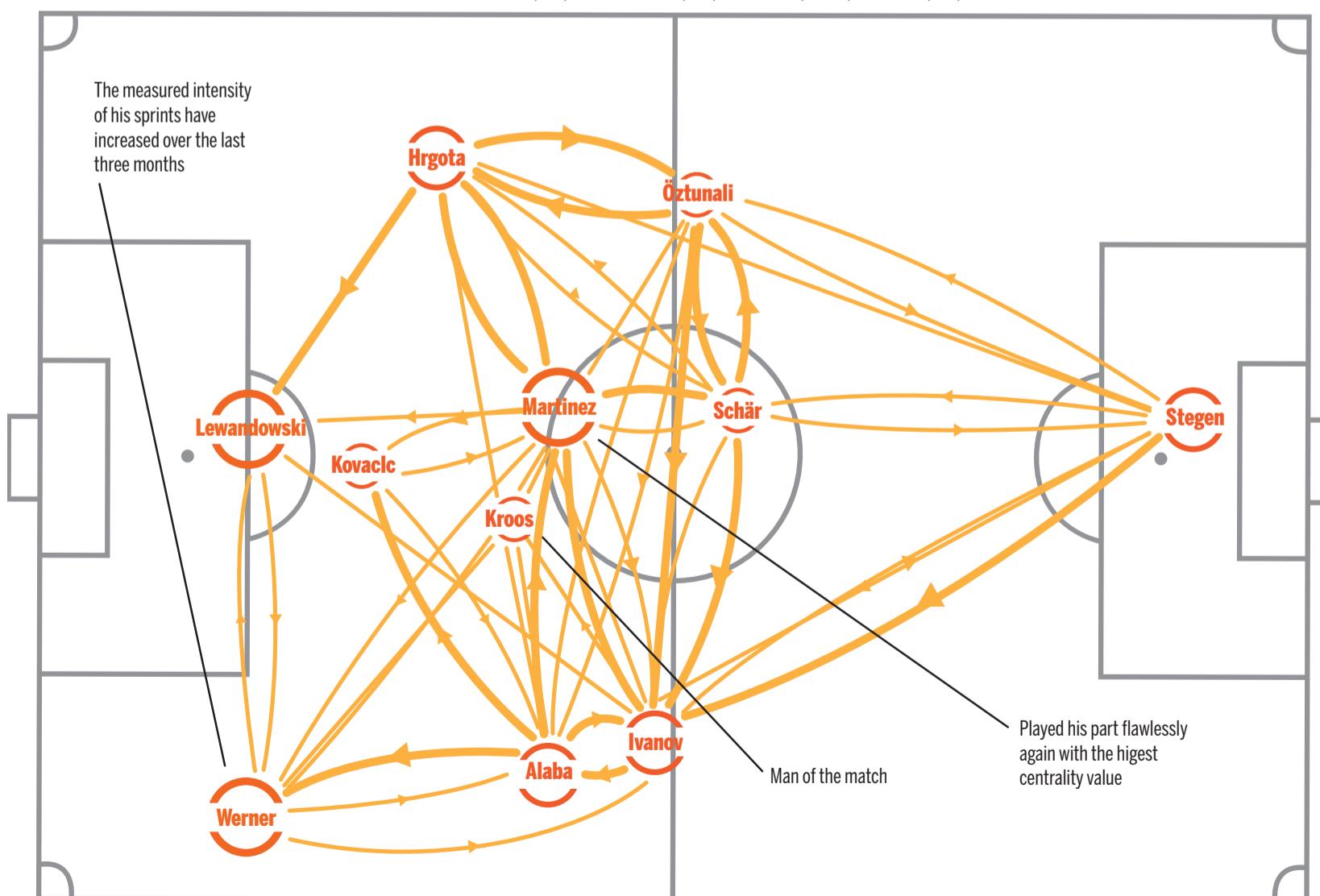
## SYSTEM SNAPSHOTS



The Born Again Christmas Tree  
Paris Saint-Germain

VS

Zugzwang  
Bayern Munich



## GRADES

# Paris Saint-Germain

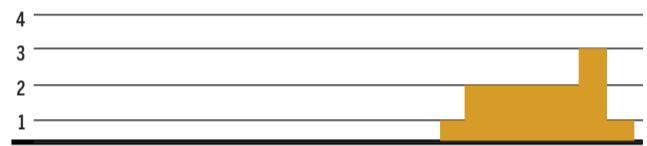
## PLAYERS INFLUENCE

**Alphonse Areola: 0.531**

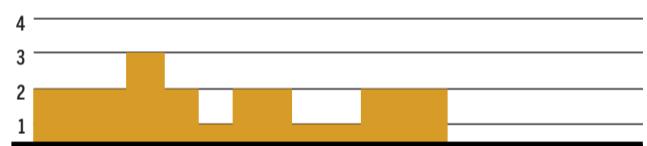
True, Sian Massey got fooled by Lewandowski's blatant dive, leading to Areola's red card. Nonetheless, the French international is not beyond reproach.

**Raphaël Varane: 0.582**

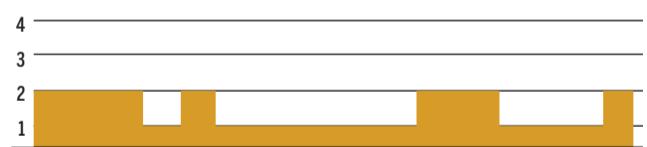
Reyes and Varane make up an efficient central defensive combination, illustrated by their 82% partnership level this season, the highest in Champion's League. Still, the Frenchman is guilty of having poorly read Lewandowski's play leading up to Areola's red card.

**Junior Malanda: 0.786**

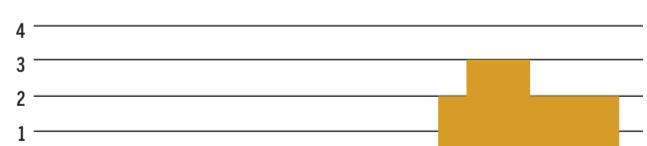
Had an amazing start, and then left his teammates too early. His lack of self-control may have cost PSG the qualification though. Remember, folks odds of qualifying are currently 7.15 at our friends from BBCBet.

**Alessandro Florenzi: 0.698**

Had a good first half, before being subbed off during Makelele's readjustments. That choice should reinforce his desire to escape back to Italy, where his physical and technical numbers better fit to the current tactical trends (see the Rumour Mill).



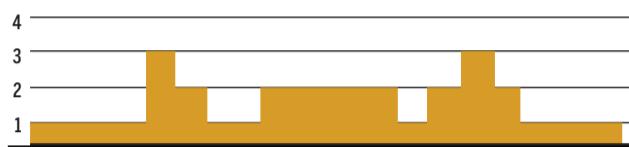
Replaced by **Kurt Zouma (0.739)** at the 61st to add weight to PSG's midfield, the Frenchman played like a beast (mainly through shoulder barging). He overpowered his direct opponent by winning most duels without actually tackling.

**Injury Report**

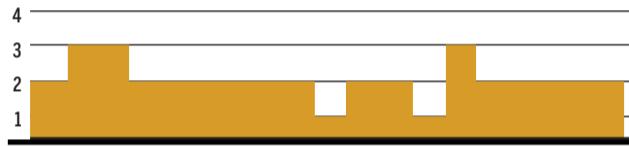
The young Levin Öztunali was subbed off limping (64th), most likely due to several tackles on his fragile ankle. According to InjuryForecaster®, and based on runs recorded before and after the dangerous challenge from Nemanja Matic (59th), Öztunali could be out for at least 6 days. If so, he won't be able to take part in the Fränkisch-Bairisches Derby next Sunday against FC Nuremberg.

**Davide Santon: 0.612**

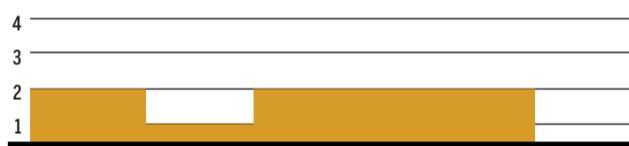
Even when his team was reduced to nine players, the fullback was able to contain the Bavarian attacks completing 4.1 km in defensive phases and 3.1 km in offensive phases with the fastest sprints of the game.

**Gregory van der Wiel: 0.736**

Might have been the only Parisian to shine, apart from Junior Malanda's outstanding early minutes. Attracted high up the pitch, delivering killer crosses in the red zone, although he sometimes forgot to track back.

**Nemanja Matic: 0.632**

We are used to more brilliance from him, especially offensively. With no key passes and an unusually low level of centrality in the game, the Serbian did not have much influence on his team.



Replaced by **Facundo "Chucky" Ferreyra (0.828)** at the 77th minute. Ferreyra showed leadership and personality, but wasn't rewarded on the stats sheet.

**Manager Evaluation**

## "Zouma's entry, which our data models consider as a counterintuitive mistake, resurrected PSG"

CLAUDE MAKELELE

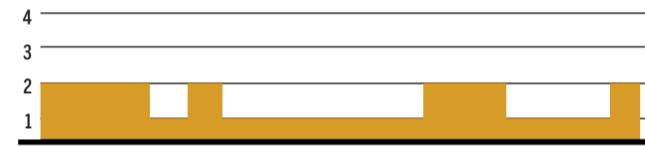
We knew that Makelele's coaching was essentially based on reaction instead of proaction, and his performance clearly proved it tonight. His three substitutions, obviously revived the interest of the game. Zouma's entry, which our data models still consider as a counterintuitive mistake, completely resurrected the Parisian team by stabilizing its midfield. PSG could have lost much more without these racy yet relevant choices by the former French international. The "Makelele role", as we called it during his Chelsea days, has a bright future ahead of him... despite the defeat and the (probable) elimination.

**Diego Reyes: 0.703**

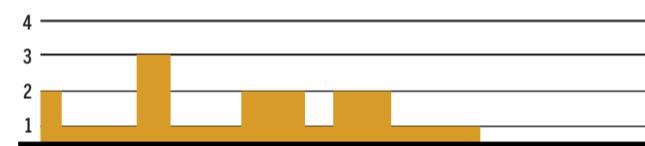
A good game from him : he put an end to no less than five dangerous plays with his timely decisions (three tackles, one interception, one foul). Still, he should have been sent off for a foul at the 86th minute.

**Marco Verratti: 0.599**

Not as superb as he was in his previous appearances, the Parisian "false 6" got the job done. Although his fouls were often needed, they were so numerous they will cost his team—he is suspended for the second leg.

**Antoine Griezmann: 0.614**

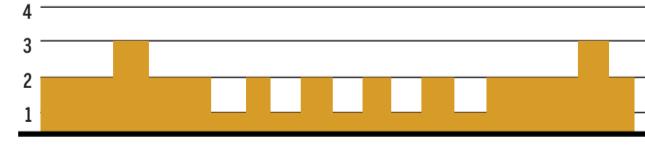
Like Marco Verratti, did not manage to rise to the occasion. He lacked precision when crossing, and intensity in his sprints. Only one of his five take-ons were successful, as his pace and stamina numbers once again revealed a player who needs a prolonged rest.



Replaced by **Rémy Descamps (0.745)** after Areola's red card (61st), who made a key save just before stoppage time. But with 61% of his long range passes intercepted, he might want to be more careful when building from the back.

**Carlos Fierro: 0.673**

A goal that was disallowed for a misjudged offside and some interesting attempts in the Red Zone. We recorded two dangerous shots and as many key passes. Nice enough from the Mexican, who returned after a three-week injury.

**Game Influence**

Total (starting XI)	9.006
Average	0.541
Total (subs)	1.938
Average	0.646
Total (if subs were starting)	8.476 (-5.88%)
Average	0.770

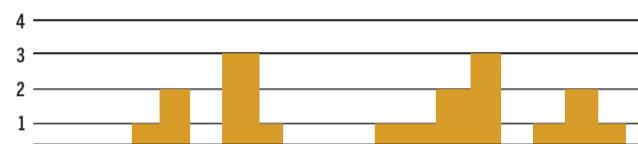
## GRADES

# Bayern Munich

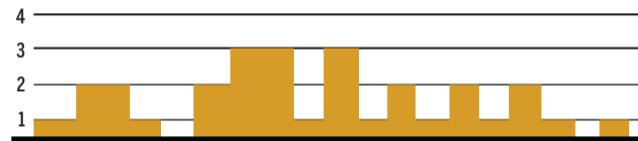
## PLAYERS INFLUENCE

**Marc-André ter Stegen : 0.773**

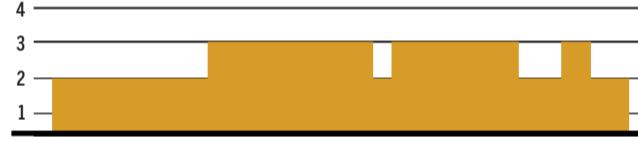
He did not have much work to do (three saves) and consolidated his already "air range" leadership, proving his is the best dominating goalkeeper the air (four crosses intercepted). The accuracy of his ball distribution allowed Bayern to keep significant possession in their own half.

**Fabian Schär: 0.639**

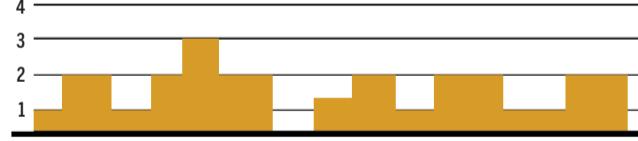
Seems to have cracked under PSG's pressure toward the end of the game, with four missed clearances due to PSG's pressing. Booked for a useless foul at the 77th, which means he's suspended for the second leg.

**Toni Kroos: 0.945**

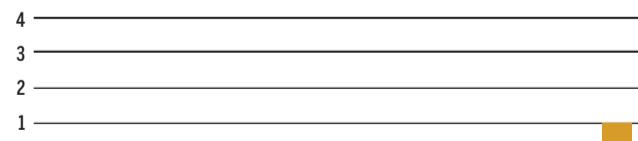
Mannschaft's captain hasn't known a bad day in a long time, shining in midfield. He started the play for Bayern's equalizer, and then took his penalty comfortably, ultimately drawing a number of useless fouls from PSG. Deservedly elected man of the match.

**Branimir Hrgota: 0.783**

The Swede did not underperform, producing more runs per minute than any other player on the pitch to free himself from PSG marking. Even though he was not rewarded for his work, his initiatives played a part in pushing the opposition's defensive line back.

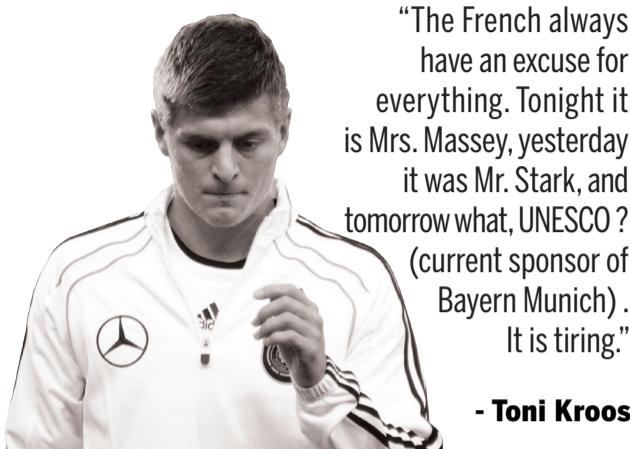


Replaced by **Jordy Clasie (0.642)** at the 78th minute, who missed an easy chance that a more self-possesed striker would have surely scored. A recurring lack of end product from the Dutchman, who has known better days.

**Game Statistics**

Total (starting XI)	6.002
Average	0.412
Total (subs)	1.031
Average	0.843
Total (if subs were starting)	8.634 (-2.82%)
Average	0.470

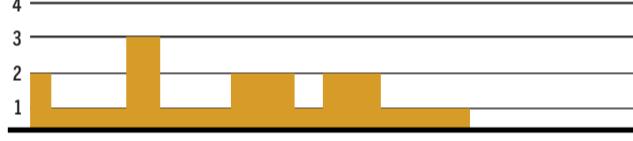
## Paris Saint-Germain 1 Bayern Munich 3

**David Alaba: 0.891**

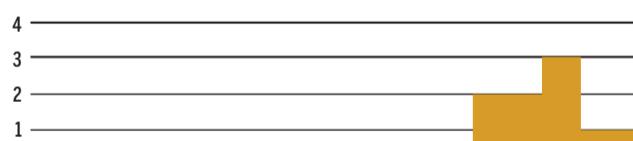
As usual, the Austrian international was tremendous, completing four diagonal passes leading to dangerous shots. Repositioned as a "point guard" following Bayern's equalizer, he made a great display of pressing in the center of the field.

**Levin Öztunali: 0.774**

Bayern has missed the injection of energy the young Turk brings to the team. He made a convincing start, particularly through his powerful yet precise crosses, before being subbed off in the 64th minute, limping.



Replaced by **Gino Perruzzi (0.712)** in the 64th, who made the most of the spaces abandoned by the PSG to make several dangerous passes from the right flank.

**Javi Martínez: 0.910**

The Spaniard played his part flawlessly again with the highest centrality value, distributing laterally flank-to-flank, a style we have become used to with him, even involving himself in some attacking plays by taking advantage of the holes in the PSG formation. Our "alternative" man of the match.

**Manager Evaluation**

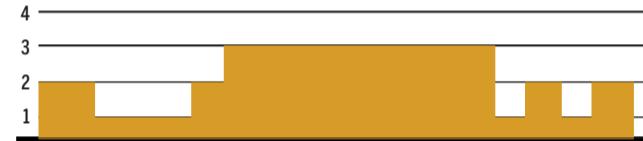
Indeed, Lucien Favre is a great tactician, and his invention of Zugzwang pressing may be the best witness of this obviousness. However, this Champions League game once again demonstrated the flaws of the Swiss coach in the psychological management of his men. If Bayern players had played the whole game as they had been during the last 20 minutes, our data models say they would have lost between 2-1 and 3-0. In fact, Bayern lacks the rage to "crush" their opponent after aggravating them. Is the Swiss coach too pacifist? The Bavarians are warned: it is imperative to finish the job in the second leg.

**Ivan Ivanov: 0.744**

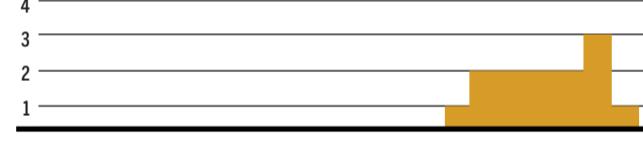
He showed slack marking on Malanda's opener, giving him far too much space to take aim at the goal, yet another failure to focus on the Bulgarian's part in the game.

**Mateo Kovacic: 0.867**

His magnificent shot towards the end of the first half gives Bayern a solid chance of qualifying. During pressing phases, his highly complementary partnership with Toni Kroos helped absorb PSG's energy. That justifies his price last summer.

**Timo Werner: 0.769**

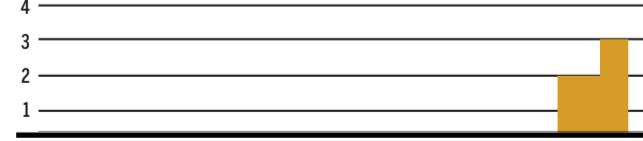
Back to the left flank, he had an interesting match as a penetrating winger. The intensity of his sprints have increased over the last three months. Importantly gave Lewandowski the ball to equalise. Sadly, he gradually switched off in the second half, forced out of his preferred position to get the ball.

**Branimir Hrgota: 0.786**

In his role as a false pivot, with six offensive rebounds won, Lewandowski completely unsettled the PSG defense. He scored the equalizing goal and won a penalty through an obvious dive, which will certainly lead the UEFA punishment. As usual, the Pole shouldered many responsibilities.



Replaced by **Ante Rebic (0.584)** at the 75th minute, who has been struggling to find his place in Bayern's unorthodox 3-1-2-3-1. The substitution won't dampen ongoing transfer rumours about Rebic.



**"The data I have so far proves that we have dominated in all areas of the game."**

LUCIEN FAVRE

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**MBC** 51 - 55 OLDHAM ROAD, MANCHESTER, LANCASHIRE, M4 5FS

Paris Saint-Germain 1 Bayern Munich 3

**PERFORMANCE SHEET****Sian Massey**

**Distance covered:**  
5 miles, 300 yards

**Average distance from the ball:**  
5.6 yards

**Average distance from the ball in the Red Zone:**  
3.4 yards

**Game fluidity**  
★★★★

**Quality of decisions**  
★★★

**Authority**  
★★

**Player protection**  
★★★★

Fairness (PSG/Bayern)  
32/38



**"Sian Massey tried to do well, she wanted it to be perfect. But, everyone knows it's impossible."**

Howard Webb

Michelle Sperry

## Referee Review

Aimee Laurence – Paris

With only an average of 3.4 wrong calls per game, of which only 0.2 on average directly impacted results, Sian Massey has ranked among the top three European referees for the last two seasons, which makes people wonder how she had such a poor performance in this particular match.

Yet, statistics tell us she does not deserve so much blame. According to our pundit Howard Webb—who has reviewed exclusive footage available on our website thanks to our Second View drone—she only made one serious mistake (Lewandowski's dive) and two minor errors which did not have any consequences. Positioned five to six yards on average from the ball carrier, Massey had, for that matter, a relatively strong performance during such an intense game.

In fact, it's only when it comes to the human aspect that Massey's night can be questioned. She was very harsh with Junior Malandra's first yellow card, applying the laws of the game in an overly strict way. Claude Makelele didn't refrain himself, denouncing a "hysterical and robotic management of the match," while Howard Webb told Sky Sports that a "semi-final is so stressful that mistakes happen. Sian Massey tried to do well, she wanted it to be perfect. But everyone knows it's impossible." Addressing critics of the Massey's gender, he emphasized the fact that she has "the experience necessary to work in elite men's football."

The PSG coach still asserted very strongly that he didn't link Massey's performance to the fact she is a woman. Likewise, UEFA already said that they would be ready to fine "anyone who would be guilty of sexist comments towards the referee". According to Reuters Social Breakdown, the game generated almost 42,000 tweets, the major part being at least partly to do with gender.

Robert Madley and Michael Olivier, the two linesmen who completed the officiating trio, had an average game. Michael Oliver was poorly positioned on Robert Lewandowski's dive, which didn't help. The penalty could have been avoided. As for Robert Madley, he erred when he called Carlos Fierro offside, which led Massey to disallow a legitimate goal. There is a good chance he will have a £750 fee to pay based on this season's new officiating accuracy guidelines.

**"Quotables"**

**"We should give serious thought to simulating the first 4 rounds of national and league cups."**

**"It would save a lot of trouble with fixture congestion and open new revenue opportunities."**



**UEFA competitions committee head Peter Glauser,**  
one week before being relieved of his position.

Jon Snyder

## World Cup 2018

# World Cup Committee Opt for Media Lockdown

By Henry Rowan—London

The Russian sporting authorities and their IT and media minions appear set to thwart a repeat of the media hacks that so embarrassed the organizers of Brazil's World Cup. Those hacks, in which Anonymous, with the help of the lackadaisical safeguards in Rio, took control of international terrestrial television feeds intermittently and distributed them freely via a series of pop-up pirate Web sites, seem to have driven the Russia 2018 committee into a total broadcasting lockdown.

As a result, as the committee hinted at this past December, there will be only one channel to view all of the live matches for the upcoming World Cup finals, via an enhanced TV/data subscription directly to

FIFA/Russian Integrated Media Multicast Network joint venture, RIMMN-S. All existing national broadcasts globally will have to take this feed as their source.

At £75/€80/2.50BTC for six weeks of access may break all but the most hardcore football supporters who want live 4K video, full multi-angle replay and live feeds of performance data for players. These rates are not for public broadcasts such as in pubs or clubs, which are running much higher at £250/€270/8.34BTC for the six week license. Expect drinks prices at your favorite viewing pub to go up as a result.

Alternatively, punters can pay per view via stripped-down feeds to BT Sport in the UK, or Al Jazeera's beIN Sport across continental Europe. To be fair, while

the direct RIMMN-S feed is costly compared to annual PTV/Mobile packages such as EE/O2's shared allSport tariff, it will carry access to enhanced raw data direct from the pitch and players' own SenseStraps, enabling a more game-like realtime view of players' health, performance and sentiment during play.

For more adventurous sport hackers, there have been rumblings that Chaos Computer Club's pirate satellites, controversially launched in January 2017 from

Brazil's Alcântara Spaceport against US and European Union objections, will attempt a repeat of their trial from last summer's Confederations Cup of redirecting satellite broadcast feeds, though the Russia 2018 commit-

tee say they have hardened all outbound live game transmissions, whether aerial or terrestrial.

Lastly, there are some hoping for new attempts by Lulz.tv to use their small broadcast drones to show some of the proceedings and stolen data feeds from a handful of the larger stadia, though World Cup security this time around has included obscuration nets over all venues to keep out unauthorized digital eyes, and also prevent streaming or sharing of stills, audio or video from attendees inside. Still, we expect enterprising hackers will find a way through, over, under or around these precautions. One way to find out how and at what coordinates to catch the cracked streams is to keep an eye on forums such as Reddit's /r/sportvideo channel or other similar forums.



## App-Happy Viewing

By Henry Rowan—London

Whatever your viewing tastes, you can be assured that, if the Confederations Cup is any indicator, the spin-off services from the realtime player data will be plenty, provided they are still able to be repurposed on the fly by enterprising app makers. Hopefully none will be as distracting as Fox Sports' much-hated floating data overlays that cluttered America screens during the early rounds of Euro 2016 (and which SkySports adopted with its embarrassing Enhanced Glass experiment for the first half of the 2016-2017 Premier League season). Sky will be providing its Feel the Game App, showing the live vitals and energy levels of players through an interface that brings to mind the old Star Trek sick bay monitors, as well as direct feedback buttons that register fan sentiment to each team's pitchside social media coach.

This World Cup could be the moment Nike's newly revamped Player+ wrist/ankleband was made for. By capturing and converting your own movement and playing styles, and combining them with standard exercise data, Player+ puts you and your mates on a digital team that can face actual sides in short matches and challenges. You can even clone yourself or a teammate to make up a full XI in case you are short, or buy professional ringers using stored funds or performance points.

Carrying on from Xbox XtraLive16,



**App-happy** users test the new XtraLive18.

Jon Snyder

cloud gamers using XtraLive18 will be able to fork live matches at key points and play through simulations using real match data while they are in play, switching from the real action on the field to digital match play, complete with real-time players, tactics and conditions on the pitch at that moment. Microsoft has added the long-requested "Second Guess" feature to the Russia 2018 release, enabling futon-dwellers to match their tactical decision scores against the gaffers shouting at pitchside.

They've also added back the Kinect 3 Post-Match Conference feature tem-

porarily released in 2016, putting you in the simulated post-match hotseat, facing actual media questions, with video uploads to GTube available (Remember, just say you were pleased with how the lads played, and not a lot can be taken from just one match!).

Finally, less a game than a game-like realtime recreation of live events, MatchLogic will bring its uncanny virtual version of real matches to fans in the UK, Germany, France and Scandinavia later this Spring. MatchLogic's service, which reproduces a digital version of each match on a 15-second delay based

on digitization of millions of data points collected each second on the pitch, has been available in Spain, Portugal and most of Latin America since last summer. However, through further negotiations with FIFA, both are now officially FIFA-licensed to use all images and details from each FIFA-sanctioned match except in local advertising. Part of the licensing deal, however, has included pushing game detail availability out to a 60-second delay to limit cannibalization of live TV and realtime data packages. The app is available for devices running Android 9.2 and later, and iOSX.

# Keeping up with The Cup — What's hot, what's not



Photo: Credit Here

PLATFORM	PROS	CONS
<b>BROADCAST VIDEO</b>		
<b>Official RIMM-S Data Enhanced TV</b>	All-in-one real-time match video + data feeds, 4K quality.	Ridiculously expensive, camera angles controlled by Russia 2018, suffers from intermittent outages, frequent local carrier interruptions and hacks during Confederations Cup. 4K quality is a waste for standard HD monitors and TVs. Bandwidth-hungry for mobiles.
<b>BT Sport in UK</b>	4K quality video.	Same problems as official all-in-one feed, plus British pundits whining about Russian broadcasting quality.
<b>beIN Sport</b>	4K quality video, more insouciant pundits. Available in English.	Same problems as official all-in-one feeds, sexy adverts for products that aren't available in UK.
<b>ENHANCED DATA SERVICES (EDS) AND APPS</b>		
<b>SkySports Feel the Game</b>	Free, though with annoying contextual ads that bug you everywhere else you go online. A fun, if meaningless, way to see how players are faring in the match. A way to vent frustration direct to pitchside.	Just a data app, no match video. While it's a cute emotional bonding exercise, it seems like a bit of fluff. While you can register support, or angry rants, direct to managers and players at pitchside, but most are just ignoring the inputs for now.
<b>Nike Player+</b>	So far, the best piece of gear for simulating playing against the pros. Cloning feature that multiplies you is useful, unless you aren't. Also functions as an activity tracker and PayBand.	At £150, a little pricey for a game add-on. Not clear what content and games Nike is planning post-World Cup.
<b>Xbox XtraLive18</b>	Split live matches into simulations you control. Ability to compare decisions made against actual manager's tactics amusing. Post-match conference using Kinect 3 adds a little immersive entertainment, if shallow.	Manager matchup is not vastly different than banging on in the comments below a match recap about what you would do differently. Post-match video feature doesn't always work well. Promised "scan yourself into the match" feature hasn't materialised.
<b>MatchLogic</b>	Availability of all World Cup matches with 60-second delay. Free but heavily ad supported. Ad-free version available in exchange for personal data.	Time delay runs the risk of constant spoilers. Occasionally glitchy during last La Liga season due to sync errors.

# Bumpy road to Moscow may not stop there.

By Frank Cox—St Petersburg

While there are no true Groups of Death coming out of the draw just before Christmas this past winter, the road to a Moscow final for the 32 teams competing in the upcoming World Cup in Russia in barely two months' time may feel a bit harsh nonetheless. Another summer of fires forecast for Western Russia combined with poor road conditions, brewing conflict with Russia's southern neighbors, and tightening security following high profile incidents in Brazil in 2014 and again during the Confederations Cup have combined to provoke trepidatious comments from several national associations. Add to this the possible pullout of the United States in protest over rolling cyberattacks, and the mood is darkening even before the first ball is kicked in anger.

The upset caused by the threatened US boycott over what it alleges is cyber-espionage from Russia that shut down major power generation facilities in New England, Texas and Washington State in January and February has rippled through preparations. The boycott threat has already created significant issues among the groups that would be affected as FIFA look at ways to replace the US team in case negotiations to forestall it fail. The Russian government have denied involvement in the cyber-attacks, though the US claims it has evidence to support its protests.

Denmark manager Dennis Rommedahl has gone on the record protesting that one of the possible sides that may be moved to a different group, potentially shifting from Group F, where it faces the Netherlands, Mexico and Peru, to Group G, where it would fill the spot left by the US team alongside Spain, Egypt and South Korea. Group F would get Canada, the side that would replace the US, in Denmark's place, extending the impact to eight national teams' already well into their tactical planning against sides they were selected to face in December's draw. Add to this issues with the possible naming of North Korean defector Ri Song-Hyuk in South Korea's side for the finals, and the political heat is already rising well ahead of Russia's summer.

International objections to the new biometric data security regimes that will be put in place for domestic and cross-border travel within and into Russia are also emerging. The ONYX system, which has been in use internally within Russia among districts west of the Urals but will now be used at the international borders as well, has been criticized by privacy groups for requiring full body scans and DNA samples to be kept on file by the government.

The host country has also been targeted by human rights groups for what they have alleged is use of biometric systems like ONYX to prevent certain ethnic



groups from traveling outside of their home regions or crossing internal *cordons sanitaires*, similar to those employed recently by the US government on its southern border and by the Chinese government in its west to limit movement of immigrant or separatist groups. Surveillance drones will also have access to the ONYX data, enabling aerial identification and tracking of visitors and locals alike. FIFA has been largely silent on the increased security, except to reiterate its position that local host committees have the right to implement security they see fit.

Despite all of these issues, the straw that breaks the camel's back may be the blanket ban on international attendees bringing personal communication and computing devices into the country, beginning in May. Even though World Cup organizing authorities have promised to make temporary devices available at reasonable costs, the ban has gone down like

a lead balloon among potential travelers, with recent polling indicating up to 55% of those planning to attend matches from outside Russia are reconsidering their travel plans.

However, some of the major international package travel groups licensed to bring European football tourists to the host cities don't seem to have digested this news, as none have so far offered any kind of formal refund program to those who have already invested thousands in match tickets, hotels and airfare. Threats of no-shows and ranks of empty seats will not look good for the Russia 2018 committee, but it also doesn't seem like the policy will be rolled back or even softened to permit personal mobile devices as several devices makers, including key sponsor Xaomi, have requested.

Things may yet cool among between the US and Russia, as might the weather, but the travel issues may still cast a shadow on the Finals. This hasn't pleased Qatar 2022 organizers, who had hoped to put similar restrictions and border protections in place. They also won't want to have to deal with any dent in future attendance that issues this summer might propel into 2022. Both Russia and Qatar have promised a return to the beautiful game after accusations of crass over-commercialization in Brazil four years ago. It looks like their jobs are getting harder, not easier, and the football fan's experience may suffer for it.

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## Top Ten



Alexandre Araujo

## Top Ten

## Hardest Tackles

The biggest, baddest and hardest tackles delivered by defensive midfielders so far this season

Sponsored by Injury\_Forecaster

**In-match data on collisions** during tackles based on video, player telemetry data and field sensors to find out which midfield enforcers delivered the hardest tackles so far this season, as measured by the g-force of the impact. Based on our analysis, Sevilla's Ignacio Camacho comes away with the prize.

PLAYER	TEAM	TACKLE DELIVERED ON	G-FORCE DELIVERED	RESULT
1 <b>Ignacio Camacho</b>	Sevilla	on Kyriakos Papadopoulos Levante 11/2/2018	91.7	Straight red card, ankle injury for Camacho, broken nose for Papadopoulos
2 <b>Sven Bender</b>	Atletico Madrid	on Adnan Januzaj Real Madrid. 19/11/2017	88.6	No card, substitution
3 <b>Geoffrey Kondogbia</b>	Lyon	on Adam Maher Monaco, 16/9/2017	88.2	Maher injured, returned next match
4 <b>Leon Goretzka</b>	Schalke	on Wilfred Zaha Manchester United, 4/11/2017	87.4	Straight red card
5 <b>Asier Illarramendi</b>	Barcelona	on Max Meyer Real Madrid, 14/10/2017	82.2	Second yellow, minor injury to both players
6 <b>Orhan Gütte</b>	Borussia Dortmund	on Raphael Holzhauser VfB Stuttgart, 20/11/2017	79.8	Torn ACL for Gütte, out for six months
7 <b>Nathan Aké</b>	Inter Milan	on Kevin Prince-Boateng Fiorentina, 17/3/2018	75.4	Second yellow, Prince-Boateng subbed for shoulder injury.
8 <b>Morgan Schneiderlin</b>	Manchester City	on Valon Berisha Liverpool, 9/9/17	75.1	Berisha injured, out for six weeks
9 <b>Maxim Gonalons</b>	Arsenal	on Okay Yokuslu Besiktas, 15/11/2017	72.9	Gonalons injured, second yellow for Yokuslu for retaliation
10 <b>Fernando</b>	Everton	on Morgan Schneiderlin Manchester City, 9/9/17	70.7	Second yellow



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hip injury

 35,3%

kneecap injury

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## Do's &amp; Dont's

# Signing Christian's Saint?

Last Sunday, Southampton's manager Matt Le Tissier told on Sky Sports he absolutely wanted to sign the young and fit Christian Maldini, currently playing in Fiorentina. Since they already have Cristian Tello and Christian Gentner in their team, we thought the Saints could have one more Christian in their team. Who should they pick? Our specialists examined the issue, helped by our exclusive team-matching software sponsored by CIES Football Observatory.

**CHRISTIAN BENTEKE**

Born in 1990  
Metabolic age 27  
Forward  
Belgium  
Cardiff City

**CHRISTIAN BRÜLS**

Born in 1988  
Metabolic age 2p  
Box-to-box  
Belgium  
Saint-Étienne

**CHRISTIAN ATSU**

Born in 1992  
Metabolic age 26  
Forward  
Ghana  
FC Bâle

**CHRISTIAN ERIKSEN**

Born in 1992  
Metabolic age 26  
Offensive midfielder  
Denmark  
Galatasaray

## Balance of Influence



## Goal Probability Added



## Sprints Recovery



## Pressing Syncronisation



**"Playing as a Blitzer could almost triple his key passes per game ratio."**

The Belgian striker just ended a marvellous season with Tottenham. His value is currently an estimated £34m, with a £3m fluctuation margin depending on his performance with the Belgian national team at the World Cup. Despite the fact that Benteke has thrived as a poacher, our analysts think that he would benefit from playing deeper as a falso pivot, in the manner of Lewandowski with Munich. Our algorithm suggests that such a change could almost triple his key passes per game ratio alongside with Duvan Zapata. Unfortunately, we don't see the Saints able to pay the transfer fee the Spurs announced last month.

**"Excelling at distributing the ball, Brüls remains a rough player"**

Revelation with OGC Nice, Europa League quarter finalist in 2016, the Belgian midfielder has been thriving with Saint-Etienne as well, coached once again by Claude Puel for the third consecutive season. Excelling at distributing the ball, Christian Brüls remains a rough player, maybe too much. In Europe, only the Celtic Glasgow captain and veteran Lorik Cana does a worst booking per foul ratio. Therefore, signing Brüls is a risk. Our estimates are confirmed by the "zero tolerance" policy promised by the FA for the next season. We recommend to the teams tracking him to think twice before making a bid.

**"Atsu is not a basic striker. Use him as a shadow striker!"**

Nineteen goals in nineteen starts. Here is what the Ghanaian Christian Atsu has brought to his team this season, although it should be noted that the Crédit Suisse Super League is far from being the strongest competition in Europe. His stats could be even more impressive had his coach Alexander Frei - who stole him from Malaga - played him at his best position. Our models leave no doubt: when he starts on the left wing, as he has done eleven times this season, Atsu's Goal Probability Added is 3.6 points lower in average.

**"Eriksen's compatibility with the Saints' diamond 4-4-2 would be a high 81%."**

Danish football's former wunderkid has found a new youth in Istanbul where he has been playing since January 2017. His failure at Barcelona, who had signed him for 32 million euros in 2016, had made his Standard & Sport's ratings fall from AA+ to BBB-. But his great performances in Europa League this season have been helping resuscitate the transfer rumours, especially about a possible return to England. The Dane thrives in "old-school" systems that some good teams have been trying to revive: his compatibility with the Saints' diamond 4-4-2 would be a high 81%.

Since the Saints are not the only ones seeking mid-season reinforcements, we added some other Christians for a humorous comparison. Should your team sign them ?

<b>CHRISTIAN FUCHS</b> 07/04/86 (31 yo)	Austria / Strum Graz Estimated value : 2.8 million	Slow, too slow for top team in Europe. Go for it only if you need an experienced defender to mentor the youngest players.
<b>CHRISTIAN GENTNER</b> 14/08/85 (32 yo)	Deutschland / FC Metz Estimated value : 4.1 million	He's still the gifted midfielder we knew in M'gladbach when they won the Bundesliga 2016. Then he's your guy if your team seeks a talented box-to-box.
<b>CHRISTIAN NOBOA</b> 09/04/85 (33 yo)	Ecuador / Shakhtar Donetsk Estimated value : 1.3 million	Only 12 games played since last summer... But don't get fooled, he's not as old as it seems. A good call if your team lacks versatile midfielders.
<b>CHRISTIAN MAGGIO</b> 11/02/82 (38 yo)	Italia / Palermo Estimated value : free	Aha... Good joke.

## Fabregas in Arsenal, the return of the prodigal son?



Mitch Gunn

Tactical analyst,  
Jack Halligan-London

The Catalan Cesc Fabregas, 31 next May, could return to Arsenal after the World Cup. The London club isn't hiding its interest for a player who had left after eight great years back in 2011. In an interview given to The Blizzard, Arsenal manager Pedro Caixinha spoke at length about the Spaniard's qualities.

"Cesc might be the key player that our team, still rebuilding, as it has been for two seasons, lacks right now. His contract with Atlético Madrid [where Fabregas has been playing since 2015] expires this Summer so we were able to get access to

his personal statistics to start the negotiations. Our scouts were able to integrate the history of his training data thanks to the interoperability of both Atlético Madrid and our softwares. Quickly the analysis confirmed that his vision, his passing and his creativity would totally fit our midfield which is short of "verticality" during transition phases. He has what we need to better keep the ball and vary our distribution of the ball. It should be kept in mind that our three main pass circuits [between Will Hughes, Melker Hallberg and James Ward-Prowse] amount to 42% of our offensive phases played, which is obviously far too much if we are to achieve our goals in the Premier League. We are too easily

negated. We would like to get this rate down to 22% or less, by reinforcing our alternative pass circuits, following the example of the Midfield Long Tail as defined by Rui Faria. With my staff, we think a player like Cesc is exactly what we need to get better."

Asked by the spanish media about Caixinha's declarations, Fabregas seemed split. Even though he criticized the use of statistic data to judge his performances, he didn't hide his desire to end his career with his first professional club. Pedro Caixinha's deep analytics, which have already helped Arsenal land Iker Muniain and Nicolas Castillo, might attract the Catalan back for a new challenge.

**"Cesc has what we need to better keep the ball and vary our distribution of the ball."**

Pedro Caixinha

## The Interview

# Neal Singh

UEFA Chief Data Scientist

Introducing today **DER BOMBER 2.0**, the all new algorithm that will rank the Champions League goalscorers.

**First, could you remind our readers why you created this new way of ranking goalscorers?**

Two years ago, the UEFA acquired my startup that specialized in forecasting outcomes of football matches. More than integrating our predictive models, they needed a fresh team of data scientist passionate about the complexity of the sport. At that time UEFA was losing credibility with obsolete methods of evaluating and ranking players. Major stars had a tendency to boost their statistics by performing against weak opponents or during games without anything at stake. The 2015-2016 season is a very good example : Lionel Messi ended as the Spanish Liga pichichi with sixty goals, way ahead of Neymar (33) and Jesé (24), but 55% of Messi's goals were scored after the 75th minute. They did not serve any purpose, they just made wins bigger. [With 148 goals, Barcelona established that season the record of goals scored in one Liga campaign, bettering Real Madrid 2011 performance of 121 goals].

Neymar and Deulofeu were as much, if not more, decisive in the capture of the title for Barcelona. But thanks to a bigger number of goals, Messi got most of the



Photo: Jim Merithew

fame and received his 6th Ballon d'Or. With the growing importance of the number of goals scored in the quest for the Ballon d'Or, both the media and online smart mobs were begging for changes. Electing the best players needed to be more complex than just crowning the quantity.

**Last september, UEFA released Der Bomber 1.0 after the launch of the Champions League group stage...**

Indeed, we had a scale that was based on the types of goals. A big part of the problem was to find the relevant weightings to reach exactly what football fans expected to highlight as a striker's value to his team. Our application was able to recalculate instantaneously the goalscorers' ranking and to send them to every

press organisation and betting company, which thus could update their odds. Thanks to this method, a performance like Alvaro Vadillo's one this season is better underlined today. He scored in every difficult game his team had to play, and often got his teammates out of a bad situation. Press organisations that work with UEFA now have much better tools to spotlight these players.

**The 2.0 upgrade is anticipated next season, and will be used by many top federations associated to UEFA, what can we expect with this next phase?**

We work with dedication on the psychological impact of goals to better calculate their importance, thus improving Der Bomber during a game. For instance,

the well-known "goal against the run of play" has an effect that can't be underrated. We thought that patient forwards, able to score on their first chance, deserved more recognition than those who already had multiple chances and whose team was dominating. Our new scale also takes into account a forward's conversion rate in a game. A player that needs less chances to score will be better ranked than one who wastes numerous opportunities. Think about Cristiano Ronaldo. I hugely respect him for what he's done in eight seasons with Real Madrid, but his conversion rate is really low compared to many great forwards of his time. We don't intend to dissuade forwards from taking risks, but we want to show how a forward who takes many shots can negatively impact his team when he has a bad day.

Ronaldo was great with Real Madrid. But I'm not sure we can remember him as an efficient player when you look at his number of shots taken per game. It is with that kind of thought process that Der Bomber will be released. Had we ranked goalscorers in 2016 as Der Bomber does now, surely Neymar would have won his first Ballon d'Or.

**We've heard about a Chinese consortium of investors and academics who are trying to reach a statistics Holy Grail: models that analyze match data and simulate in-game tactical solutions, as a sort of artificial assistant coach...**

Football, and its complexity, captures the imagination of many data scientists and the interest of "Big Data" companies that want to win big. And to my knowledge, nobody has achieved anything concrete yet on that front.

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COMING SOON

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# New data doping case rocks the MLS

## Fierce competition between talent agents spurs questionable tactics.

AP-Toronto

The data doping case that rocked Major League Soccer last summer when it first emerged now doesn't seem to want to end. The Montreal Impact, one of MLS's four Canadian teams, and the league office have now filed a joint complaint against Roger Zuta, the Switzerland-based agent of five young Bulgaria-based players who joined Montreal's youth teams last summer, based on new evidence refuting Zuta's claims of accidental data corruption.

According to the Impact's Sporting Director, Jean-Raymond Fayard, a just completed review of forensically recovered data logs kept on the five Bulgarians while they were at Spartak Pleven's academy from 2015-2016, before they came under Zuta's management, shows a different training trajectory for all five players prior to Zuta representing them. Impact's official data provider released new models that prove that it is impossible for players so young and otherwise unsupported through training and nutrition to have such a change in physiological and performance characteristics simply based on a new training regime, as Zuta has claimed. Instead, says Fayard, the newly surfaced data, along with earlier information on at least three of the players from their original youth clubs in Ivory Coast, proves that the more recent statistics pro-

vided by Zuta, supposedly from Pleven, were intentionally doctored.

"We shouldn't have trusted Roger" Fayard said. "He in effect juked the stats of the players he represented. Mediocre midfielders who hadn't shown marked improvement during their past years of training suddenly became undiscovered prodigies with exciting performance forecasts, and it was those forecasts which attracted us to do a transfer deal with Pleven. Missing contradictory data, my staff took Zuta and Pleven's certification of the data at face value, and then did not perform the necessary sanity checks. Nonetheless, we believe there has been a criminal act of data fabrication here. I wouldn't be surprised if this isn't the tip of the iceberg."

Current investigation also revealed links regarding somewhat sophisticated data fabrication methods in Roger Zuta's browsing history, also uncovered during the forensic investigation. "Roger Zuta was a reference to represent Eastern European football talents. But the new competition between agents pushed him to cross the line" said Javier-Prieto Santos, former CONCACAF head of data management who led the investigation at the request of the MLS.

Indeed, Roger Zuta doesn't fit the hacker's profile. Coming from a well established firm of sport agents, his under-



**Roger Zuta**, is being accused of tampering with player data.

Jim Merithew

standing of actual data doping techniques seems rudimentary, according to Santos. According to the investigation's interim report, "Zuta appears to have worked with an unidentified third party to carefully boost only some of his clients' performance histories, and then only subtly, and only within certain areas, such as lactate thresholds, so-called cardiovascular drift and visual acuity. We know, however, that these players' newly uncovered youth baselines would have been nearly impossible to improve so quickly, and the Ivoirians' data in particular didn't match norms suggested by their previous climate conditioning but looked more like the Bulgarian data. We also know that such selective doctoring and errors are highly unlikely to be the result of technical problems with data collection, as was suggested. All of the numbers would have been affected. This took skill outside of Zuta's known capacity."

A recent FIFA report remarked the increasing number of data doping cases, encouraging game and training data providers to improve the security and integrity of their systems, and to adopt fraud detection algorithms much like those used by banks to determine unusual behavioral shifts that help flag fraud. The few cases already uncovered involve organized networks of sports performance analysts, agents and players, making them harder to detect, but easier to unwind once suspected.

Still, Jean-Raymond Fayard is hoping that this example will help restore balance between agents and small clubs insufficiently educated to the use of data. FIFA has already announced the launch of a program that will aim to develop the awareness of these digital issues, and is holding meeting on the possibility of establishing a formal Data Integrity Unit. A decision on this is expected at FIFA's winter meeting in December.

## High tech cricket entrepreneurs to improve sagging national game

By DN Kean—Sydney

Well off their dreams of reaching test-match status in 2020, the Chinese Cricket Board have turned towards teams on a local level, where clubs are adopting a new structure in a bid to amplify interest in the sport within their communities. Increasingly, the Chinese Cricket Board are visiting smaller clubs, where a countrywide grassroots initiative has introduced the role of technical officers to the game, experimenting with technology in order to heighten the performance of the players.

Mei Lei, who currently acts as technical officer at her local cricket club in

Shenyang, has implemented her own analysis system to process the results of each player. Embedding sensors within Shenyang's wholly astroturf ground, Lei has found a moderate success in the efficiency of batting and fielding, with accuracy improved as Lei's instant prediction software allows fielders to 'hear' where the ball will land. Using technologies adapted from Hawkeye, the software quickly calculates the trajectory and speed of the ball in order to map out where it will hit seconds before it does. In-ear

headphones that make a sound similar to a geiger counter allow players to move towards the landing spot. Lei's project has

been tested in-play, with technical training becoming part of the regular schedule required by Shenyang's players. The Shenyang Cricket Club first-team squad are also asked to wear bracelets that track their activity in-play, and log their patterns outside of the cricket ground.

Lei's project started at the University of Shanghai, originally conceived as an engineering solution to faults in construc-

tion and planning technologies. Completing her masters degree in engineering at Sussex led to a passion for cricket, with the Sussex County Cricket ground a short walk from her University accommodation.

Aware of cricket's slow growth in China, Lei is hoping that more technical officers will be adopted by local clubs: 'We don't have the same investment in cricket as there is in England, so a lot of the technology I'm using has been donated by the University, or pulled together from existing systems. We're hoping that technical officers will bring the investment necessary from sponsors, so we can get China interested in the sport we love.'

Image not available  
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# Match hacker awaits extradition to Italy

Hack attack was retribution for refusal to fix the match, investigators say.

by ANSA - Rome

Investigators looking into the so-called "DDoS-opoli" hacking scandal in Italy's Copa Italia have suspended their inquest until one of the prime suspects in the case, Ferhat Yilmaz, can be extradited from Thailand where the Cypriot is currently being held by police on suspicion of breaking into several major banking systems in the country. He was arrested at Bangkok airport while attempting to board a flight to Hong Kong.

The Italian scandal stems from the cancellation of a Copa Italia fourth round match between Trapani and Reggina last December due to the failure of Trapani's

players' body sensors late in the second half. With the score 2-2, the malfunction left team coaches without any data on the players' health and performance. The referee's scoring systems were also knocked out, as was the website for TIM, the Copa Italia sponsor. Technical investigations later determined the outages were related, and blamed them on a carefully orchestrated attack on the internal network of Trapani, the home side, the referees' systems and TIM's corporate networks. The attacks, a so-called distributed denial of service hack, or DDoS, flooded the networks with traffic from a small number of servers located in Thailand.

Investigators say they have evidence



Catherine Kortsmik

from informants that the attack was in retribution for several Trapani players' refusal to fix the match once it was underway. The investigators also believe several other episodes of technical failure in a handful of Serie A, Greek Superleague and Turkish Süper Lig matches may also be to blame on Yilmaz. All of these matches were played to completion, though all but one had lead changes following the technical blackouts, leading to suspicions the attacks were carried out as a form of match fixing. Italian and Thai officials

suspect Yilmaz and others may also be responsible for similar disruptions in Thai and Australian A-League matches over the past year.

Yilmaz has been previously convicted and jailed for 14 months in January 2016, along with several other Cypriot hackers, for interfering with Bank of Cyprus computers. According to police, some €3 million went missing around the time of the 2016 attacks, but the missing funds have never been tied back to Yilmaz and his accomplices.

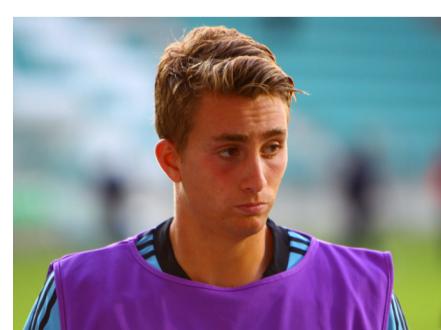
# Euro league moves on high frequency betting

By ANSA - Rome

The Association of European Professional Football Leagues (EPFL), the Switzerland-based body that represents the major football leagues around the Continent and UK, has asked that real-time odds from high-frequency betting firms be prohibited from display on pitch-side advertising screens and elsewhere in major football stadia, effective immediately. The move comes in response to a raft of complaints from both players and teams that the display of real-time data, where players and management can see them, is having a direct impact on player performance in matches. The odds data, which has been shown on screens in Spain's La Liga and the English Premier League, effectively reflects up to the millisecond shifts in odds based on the analysis of so-called HFB, or high-frequency betting. HFB activity is primarily run by a handful of specialist hzjusted simulation.

Several high-profile players have complained that seeing the constantly changing odds detracts from their focus and motivation in matches. A few, including Valencia's leading scorer last season Isaac Cuenca and Spurs' Gerard Deulofeu, last year's Golden Shoe winner, have spoken out publicly against the displays.

**Deulofeu has put his dry patch of 14 matches without a goal this season down to the live odds**



Deulofeu has put his dry patch of 14 matches without a goal this season down to the live odds "getting in my head," as he complained to BBC Sport last week after missing an open goal against Rangers. "It's one thing to lose the manager's confidence," he told Match of the Day's Abby Clancy, "but it's devastating to think of some guys hiding in an office somewhere on an island, predicting your every move. Once the odds start falling, your confidence just goes." Cuenca has also seen his performance decline, and Valencia boss Eric Abidal has continued to argue against the displays, saying he has lost the focus of his team.

Several league heads have complained about what they claim are HFB "spotters" at the grounds, filming matches on tablets or other devices, feeding them back to live simulation engines at another location. One Chinese spotter was ejected from Anfield last month with a not-yet-released iPad Fold loaded with data and video of over two dozen league and cup matches, and a pair of what are believed to be next generation Apple iView contacts for which only leaked GIFs have been seen. He was only spotted when a nearby fan told a steward the man's eyes were flickering unusually.

Lucky8 and Velocitybet have both issued statements protesting the possible ban, claiming the service is a legitimate form of derivative betting. The EPFL, spurred by the European players' union, have promised to push forward with the move before the end of the current season.



Tougher ground for Garin

AFP-Paris

The Chilean Christian Garin, who was one of Roland-Garros favourites, announced yesterday he was out for the tournament. After he beat the aging Gaël Monfils with great difficulty in the first round, doubts were raised about his condition. He answered them forcefully in the press conference broadcast on his personal Twitch: "My legs are fine but my spirit is in pain. The ATP want me dead." Shocking yet unsurprising words from a player who had expressed his discontent after the clay was changed on the new courts in Porte d'Auteuil. For this first edition located Bois de Boulogne, the International Federation has decided to make the surface quicker by changing to a new graphene-based clay, ending this way the Nadal era once and for all, which is clearly not to everyone's satisfaction. Rafael Nadal won the Parisian tournament eleven times between 2005 and 2016.

Catherine Kortsmik

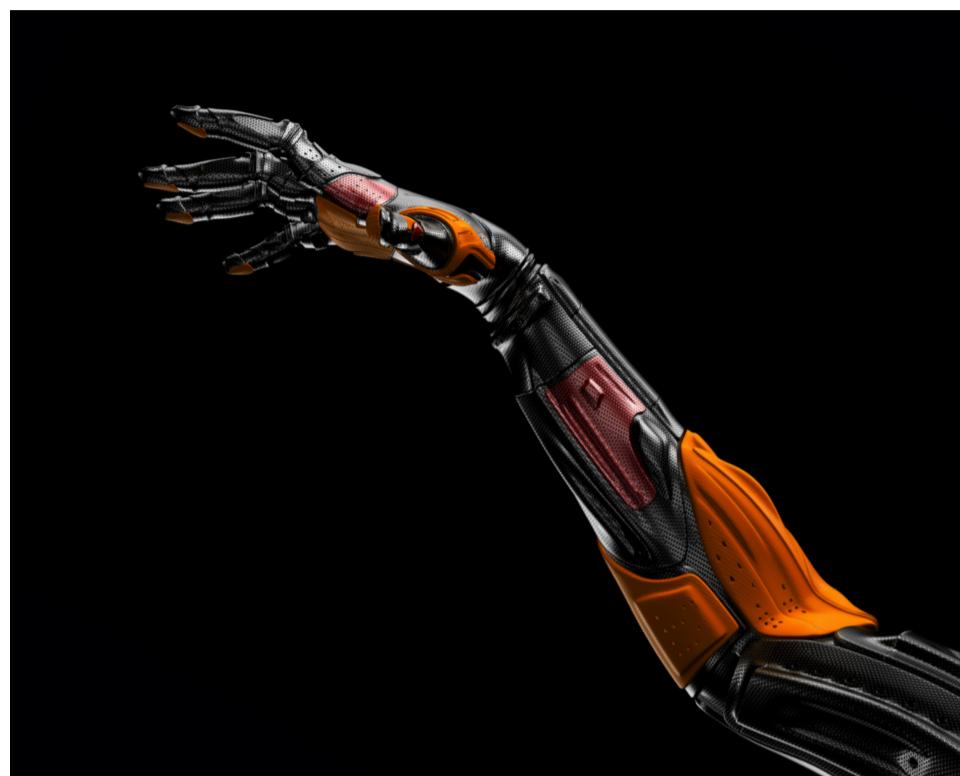
## UEFA to evaluate Larry Azouni's prosthetic arm

AFP—Marseille

Olympique de Marseille, currently ranked 5th in the French Ligue 1, may become the first professional club to pick an amputee in its starting XI. The southern club has taken its case to UEFA as they hope to be allowed to play the 24 year-old midfielder Larry Azouni, equipped with prosthetic arms since a car accident in April 2016.

OM assisted the Tunisian international during his rehabilitation and he has been training with the reserve team since last summer. He is supposed to undergo a series of trials in order to evaluate the injury risks presented by his prosthesis, as well as their impact on the game itself. According to UEFA legal officer Pierre Cornu, "this prosthesis influences the player's balance. We wish to examine to what extent this exogenous addition might impact, either positively or negatively, the player's abilities on the pitch, especially regarding dribbling and passing."

Unable to get up-to-date data, UEFA have decided to employ an unprecedented algorithm developed by Koliko Khola, a promising Indian start-up, and sponsored by the International Wheelchair & Amputee Sports Federation. This algorithm will extrapolate from existing statistics about Azouni, focusing on 2014 to 2016 seasons (seventy-three



games, including fifty-seven starts) and based on a development benchmark created by using statistics on 1322 professional players across major leagues. The goal will be to determine whether the prosthetics provide Azouni any advantage he might not otherwise have.

The application will then compare those theoretical statistics with Azouni's ones during in situ tests that will occur next summer in Geneva. Although UEFA

admit there is "a 13% error margin because of the novelty of those anticipatory modellings", they have assured they will do their best to "facilitate the integration of disabled persons in both non-professional and professional football and hope this test will be the first of many." UEFA also plans to announce several measures dedicated to disabled players, which will be announced at the end of the World Cup.



## "Mega" Watts for Kudus

AFP—Paris

Where will the Eritrean Merhawi Kudus stop? The already world record holder of watts produced in an ascension and recent Tour de France winner, who will take part in the Qatar Petroleum Challenge next week, improved his performance yet again. Yesterday, in the mountains belonging to his great Colombian rivals, he reached 510 watts of output for the first time, as measured by his Quarq power sensor and certified by the International Cycling Union. Ironically, this event happened a few days after Alberto Contador was hospitalized due to a kidney ailment thought to be the result of years of using untested supplements. The controversial Spaniard had established an unofficial record in Verbier back in 2009 (491 watts).

### Parting Shot

## New NBA 3-point record

AP—New York

For the first time, a basketball team scored more than fifty three-point shots in one single game (out of ninety-three attempted). It happened yesterday in the NBA, during the match between the Los Angeles Lakers and the Charlotte Hornets. The latter, known for their "small ball" style, with four starters under 6ft 6 and the center Rudy Gobert (7ft 1), made the most of their "run and gun" strategy: aggressive defending, three-pointers at first sight and only Gobert around the rim to get rebounds. This tactic led them to the Finals last year and could pave the way for Klay Thompson, best scorer of the League, to his first Gatorade MVP title.



Domenic Gareri

## Project description

Sport and data have been connected over the centuries—giving us a means of telling how high, how far or how fast our heroes perform. With the spread of technology deeper into sport in recent years, data has become increasingly central to how sport economies work, allowing us to measure athletes' capabilities, analyze minute movements, and classify every element of every action, breaking often fluid movement of individuals and teams into formulae to be parsed, understood and optimized. As a global game, football is now at the forefront of this technological immersion, and we increasingly see it through the lens of objective knowledge.

In this newspaper, we investigate this evolution through narrative and design fiction, highlighting the implications of this intensifying relationship between data and football. The project touches on more easily seen aspects of performance analytics, and new ways to depict and consume football in media, but also explores near-future possibilities hiding just below the surface, such as data manipulation as a kind of doping, the impacts of high-frequency sport betting, or politics related to data-based services like media, measurement and reporting.

This fictional newspaper is part of a Near Future Laboratory project commissioned and produced by FutureEverything, National Football Museum, Centre for Contemporary Culture Barcelona – CCCB, and Fundación Telefónica, supported by ECAS, a European Commission Culture Fund project and MEDIAPRO.

### ORIGINAL IDEA AND PROJECT LED BY FABIEN GIRARDIN

(Near Future Laboratory) in tight collaboration with futurists and writers Scott Smith (Changeist) and Philippe Gargov (Seeklup).

### DESIGN AND GRAPHICS BY BESTIARIO:

Andrés Ortiz, Julian Jaramillo and Paola Avellaneda

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## Method

Our goal is to understand how imaginations and hypothesis become materialized to swerve the present into new, more habitable near future worlds. Our practice involves working closely with creative, thoughtful experts within various domains of work. In this project we mixed foresight techniques to capture weak signals and large disruptions in technology and society with a design approach to create fictional narratives of the future that focus on the implications behind the signals. The result is NOT about predicting the future, but involve the reader and visitor in considering the evolution of football with the increasing presence of data.

Some implications that we highlight are:

**Data vs. Nous**

**Data-Literate Managers**

**Winning Formulas**

**Big Data Becomes Big Investor**

**Metrics for Injury Prevention**

**Enhanced Game Watching Experiences**

**High-Frequency Betting**

**Data Manipulation as a Kind of Doping**

**Video Game Inspired Player Roles**

**Match Hacking**

**Trench Battles over Data Rights**

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