

of the total commitment, the new orientations have turned towards strengthening the middlefield posts, either by withdrawing in attacker, or by forwarding a quarterback in this area, both having a great technical value. As a results of increasing the number of players at the middle of the field, of the game leader with two or three very technical players, fine dribbles who are able to produce number superiority, freeing players for the final scoring and thus increasing the spectacular side of collective game constitutes one of the innovations of modern game.

The complete model of the referee should offer a strong balanced temperament, authoritative character, an imposing somatic type, an age compatible with obtaining and excellent vision and perhaps the memory of an extended football career, the comprehension of the essence of modern game.

It is clear that errors-some of them serious-did occur in the hundreds of often very difficult decisions taken over the 64 matches. These errors are neither covered up nor justified but are meticulously analysed to learn from them and improve future training plans. The challenge is to work towards improvements.

Another cause for satisfaction from a refereeing standpoint was the emergence of young

talent at this competition, who officiated some very difficult matches.

This is the fruit of the FIFA programme for preparing World Cup referees. For example, the young Uzbek referee (N.Irmatov) did a brilliant job I the opening match, surprising many, but not FIFA, as he began his training with us in 2003.

Several other officials from various parts of the world further demonstrated the effectiveness of these preparation programmes for the referees taking part in the World Cup.

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CONSIDERATIONS FOR UNDERSTANDING THE TECHNICAL AND TACTICAL CONCEPT OF FOOTBALL THE EUROPEAN CHAMPIONSHIP 2012 FROM POLAND AND UKRAINE

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Abstract

The 2012 U.E.F.A Championship showed that nearly all teams now play with a compact defence and are able to put even the strongest opponents under pressure. The most successful teams were flexible and able to adapt their style of play to the match situation. It was this flexibility, together with the teams' healthy aggression and players' excellent technique that paved the way to success. The European Championship also showed that excessive combination play can lead to a lack of aggression.

Keywords: *compact defense, able to adapt, match situation, quick transition, the first goal, under pressure.*

The most successful teams also boasted fast, tricky attackers who were dangerous in front of goal. Italy, for example, were the perfect example of a solid team that performed well and enjoyed success. In Ballotelli and Pirlo, they had a strikerforce that posed a threat to every defence. Portugal-Cr. Ronaldo and H.Almeida, Spain-Villa and Torres, Germany- Klose and Muller all had attacking players who were capable of winning match on their own.

Individual pieces of skill could also turn matches in other ways, however. In modern

football. it is difficult to get in behind the opposition defence as teams are often very compact at the back with eight or nine players behind the ball. That is why teams now need outstanding individual players who can make their mark in one-on-one situations down the centre of the pitch, but particularly down the wings, where they can drive as far as the opponents' goal to create space that often does not exist down the centre of the pitch.

Once they have reached the goal line, these players do not always look to cross the ball high into the penalty area, but instead they often

look to cut the ball back along the ground for on-rushing team-mates.

As mentioned above, the successful teams were built around a well-drilled tactical system. In addition, they all had a well-organised defence that still gave the players the freedom to express themselves and use their own strengths while pushing forward. The team played with a back, with the exception of Russia, Holland and Croatia, who had three-man defences.

The team had a traditional starting formation of 4-4-2 with two banks of four behind two strikers, with one of these strikers often playing in a more withdrawn role. England, Greece and Portugal were good examples of this. It should be noted, however, that these teams were also able to make changes and adjustments depending on the match situation or to take advantage of their players' individual qualities.

Greece's 4-4-2 formation had a four-man diamond in midfield, whereas Portugal fielded two defensive midfielders and two wingers who came inside when possible to make room for their advancing full-backs. Croatia, meanwhile, played with two men in front of the defence as well as with three midfielders to help out in both attack and defence.

Another tactical formation was 4-3-3, which was used by teams such as Spain, Germany and Netherlands. In this formation, a defensive midfielder played in front of the back four and was flanked on either side by another midfielder, with three strikers up front.

As soon as the team lost possession, the wide strikers dropped back to form a nine-man defensive block with the midfield and defence to try and prevent the opponents from building attacks. When their team was attacking, they tried to exploit the space down the wings as quickly as possible.

Of the four semi-finalists, only Italy played in a formation that resembled 4-4-2 (1-1), although the position occupied by Pirlo or Cassano merits further examination. Although they were in principle a second striker, he mostly played in an advanced midfield position behind the team's main striker, Ballotelli. In effect, Pirlo had a free role and was always looking to keep play moving before driving forward.

The Netherlands, Germany and Spain all used a 4-2-3-1 formation, but even so they all interpreted this system in their own way.

The Dutch, for example, fielded an attacking trio behind their lone striker, Van Persie. Robben and Kuyt played on the wings, but they were always looking to push forward to create a three-man attack with Van Persie, Robben and Kuyt often rotated and swapped positions during matches. If the other attacking midfielder, Sneijder,

was regarded as part of the midfield, then the Dutch also operated in a form of 4-3-3.

Germany also only had one man up front: Klose or Mario Gomez. This formation left Podolsky and Muller, two players who usually play in a more central attacking position for their clubs, to exploit the space down the wings. Ozil completed the German attack by operating as an attacking centre midfielder, but he too pushed forward to join attacks or drifted out to the wings.

Spain played Xavi and Iniesta out wide, even though they too are generally known as centre midfielders, but they were also given the freedom to express themselves when going forward and often swapped positions. In Spain's first few matches, David Silva pushed on from an attacking midfield position to join the main striker, Torres. In the semi-final and once again in the final, D.Silva operated in a more traditional centre-forward role, mainly because Pedro had replaced Torres for both of these matches.

The 4-2-3-1 formation is always based around two defensive central midfielders who provide stability for the defence and are also to support their own team's attacks.

The opening group matches were characterized by cautious play. No team wanted to lose and put themselves in a dangerous position in the group, and as a result, goals were few and between. Only Germany, Italy and Spain started the tournament with the necessary self-confidence, which led to comfortable opening victories. This caution prevailed throughout the rest of the group stage, and it was one of the reasons why only 56 goals were scored by the end of the group stage.

The following factors can shape or have a major effect, whether positive or negative, on a team's performance in a tournament:

- Mental and physical fitness-how "fresh" were the players at this Championship? Did those players who had been playing in domestic league championships and continental competitions have enough time to recover and prepare for the European Championship? In contrast, players who are usually substitutes at their clubs were able to show their ability and shine at this tournament.
- Weight of expectation-how did teams cope with the weight of expectation, especially when there were high or over-optimistic levels of expectation? There was a great deal of pressure on the Greece hosts and quite understandably they found it difficult to live up to these expectations. Other teams had a similar problem. Even more "established" football nations such as Italy, France, England and even Germany had to deal with high levels of expectation.
- Shocks and surprises-the early exits of Russia, Sweden were the major shocks of the tournament.

- Strategies- teams were successful if they started a game with a set strategy but were able to adapt during the match. It was interesting to see Poland or Ukraine, an experienced and well-drilled team, lose their focus after Croatia or Sweden.

- Goalkeepers-it is fair to say that goalkeepers in this year's European Championship were not very consistent, as excellent performances were followed by inexplicable errors. They not only struggled to boss their penalty area and communicate with their team-mates but also experienced difficulties with shots from long range. Many of these errors led directly to goals.

It was also interesting to note that the best teams conceded very few fouls-if any- around their own penalty area to avoid giving away free kicks in dangerous position.

There were two tactics to gain or regain possession.

a) Teams such as Poland, Portugal, Italy lay in wait in their own half of the pitch before launching quick counter-attacks to catch opponents off guard. Some teams defended too deep, however, which meant that their defenders could be outpaced.

b) Other teams such as Spain, Germany aggressively tried to win the ball back in the opponent's half of the pitch or close to the halfway line at the latest. This tactic prevented opponents from building attacks as they were not given time to construct moves.

Balls played in behind the defence from the centre created a significant number of goals (19) and chances, mainly because the "weaker" teams did not stagger their defence, which meant that they were easier to bypass. Creative wing play was another way to create space and goalscoring

opportunities. Teams who used this latter tactic needed good dribblers who were able to get to the goal line before cutting the ball back for advancing team-mates. Congested penalty areas meant that traditional, high crosses were less successful. Long diagonal passes were another option for pulling opposition defences out of position.

Successful teams were also able to switch quickly between defence and attack. Counter-attacks were successful if teams could bypass the midfield quickly and make accurate, well-timed final passes. Teams such as Germany, Spain, the Netherlands were all specialists in this regard. These teams passed the ball around quickly, trying to take as few passes as possible before taking out the opposition defence. If they lost the ball, they put immediate pressure on the man in possession. By doing so, they hoped to force their opponents into losing possession, which they could then exploit as the opponents would still be on the front foot. It was interesting to note that in the second and third phases of tournament, far more goals were scored on the counter-attack, which was due to the teams being more attack-minded.

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INVERSE DYNAMIC ANALYSIS OF THE HUMAN LOWER LIMBS DURING GAIT

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Abstract

The simulation of musculoskeletal models of the human's body provides critical information about the locomotion mechanism. This information can be used to predict abnormalities and to provide mechanical solution at different levels of human body bio-mechanical structure: muscle system, joint system, bone system etc.

The aim of this paper is to analyze a Multibody system representing the musculoskeletal system of the lower limb in order to determine forces and moments of forces. To achieve this, we have applied an inverse dynamic analysis to an open source kinematic model from OpenSim aiming to calculate the joint's reaction during gait.

Keywords: *biomechanics, inverse dynamics, Multibody System, kinematics, sport, lower limb, gait analyze, OpenSim*