



# Performance Analysis in Soccer

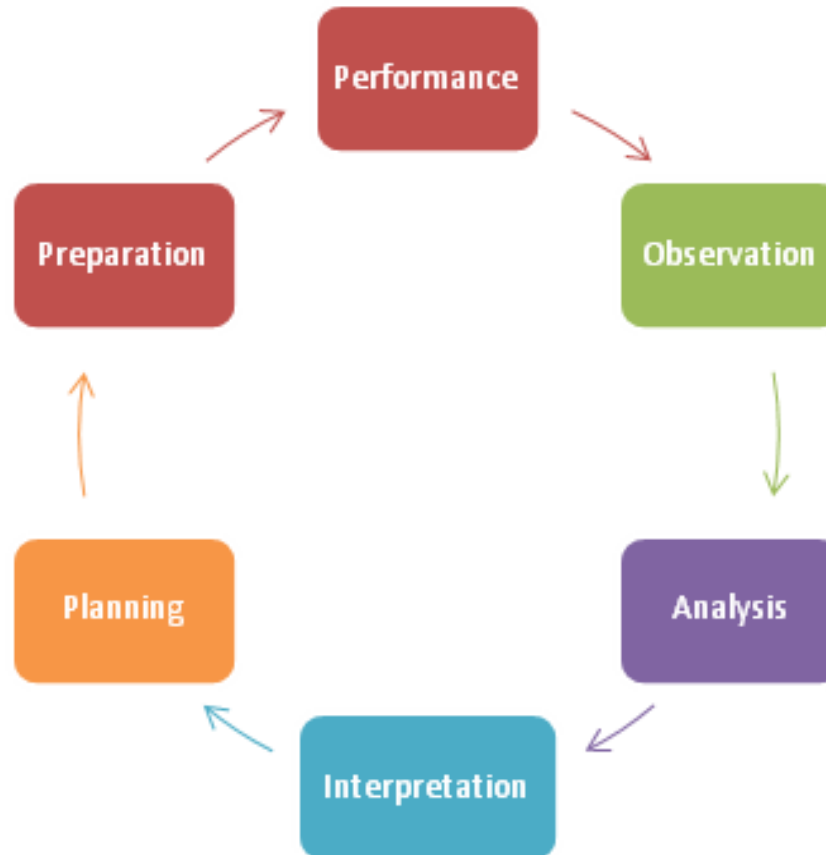
Mark Williams, Ph.D.  
Professor and Chair  
Health, Kinesiology and Recreation  
University of Utah



# Performance Analysis in Soccer

- **WHY?**
- **WHAT?**
- **WHEN?**
- **HOW?**
  - ✓ hand-based
  - ✓ video
  - ✓ computerized (video/GPS)

# WHY analyse matches?



# WHY analyse matches?

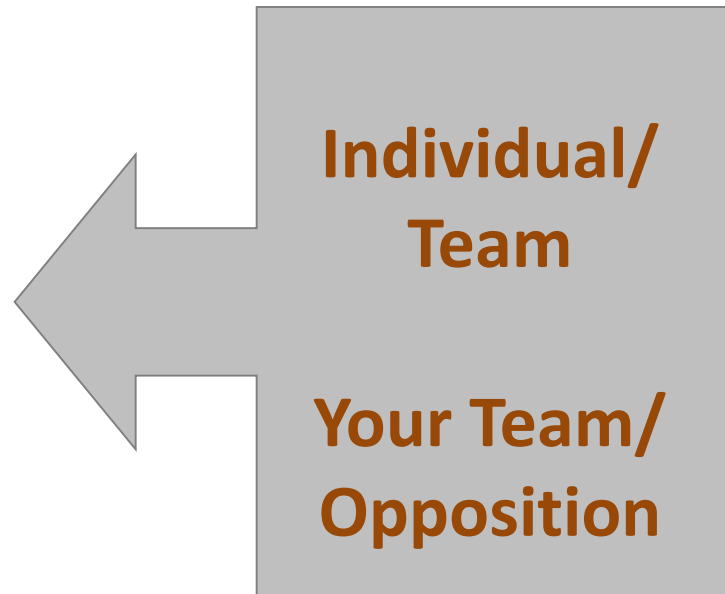
## Constraints

- Viewing Environment
- Limitations of Human Memory
- Set views and Prejudices
- Effects of Emotions on Judgement

**Performance Analysis = OBJECTIVITY**

# WHAT can be analyzed?

- Tactical
- Behavioral
- Physical
- Technical



# WHAT can be analyzed?

## Behavioral

- Anticipation
- Decision making
- Body language
- Communication
- Coach behaviors

9:48

CHE 0-0 CHA

PLAYER CAM 5

**FRANK LAMPARD**

AGE	25
APPEARANCES	138
GOALS	25
POSITION	M













World Cup

Default lead 2

SHOT AT GOAL

### ANALYSIS OF MATCH ACTIONS

DRIBBLE WITH BALL	WALK WITH BALL	RUN WITH BALL	THROW-IN	CROSS
SHOT AT GOAL	FREE KICK	PASS	CORNER	CLEARANCE
Goal	Pass	Ground	Short Pass	Head
On Target	Cross	Chest Height	Cross	Foot
Off target	Shot	Over Head Height		
Blocked	Goal			
Headed	On Target			
Set Play	Off Target			
Set Play 2nd Phase	Blocked			
Open Play				
Own Goal				

merge rows

Make movie

Append slow

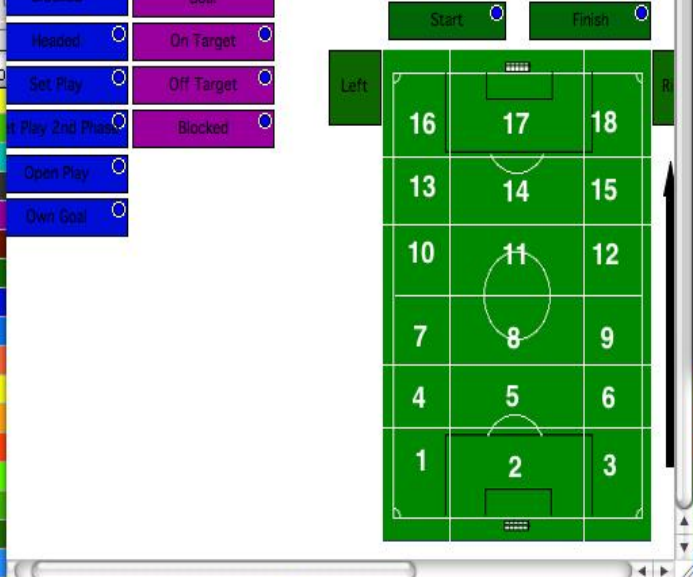
Static text

Instance

Overlay

01:31:31.67

3	CLEARANCE	
4	WALK WITH BALL	
5	RUN WITH BALL	
6	CROSS	
7	FREE KICK	
8	THROW-IN	
9	CORNER	
10	SHOT AT GOAL	
11	DRIBBLE WITH BALL	
12	FORWARD BALL MOVEMENTS	
13	1 Pass Movement	
14	2 Pass Movement	
15	3 Pass Movement	
16	4 Pass Movement	
17	5 Pass Movement	
18	6 Pass Movement	
19	7 Pass Movement	
20	8 Pass Movement	
21	9 Pass Movement	
22	10+ Pass Movement	
23	REGAINED POSSESSION - ATTEMPT	



Matrix

Code matrix organiser, May, 27, 2008 10:51:04

Print

From Code matrix organiser. Linked to: Francevsitaly

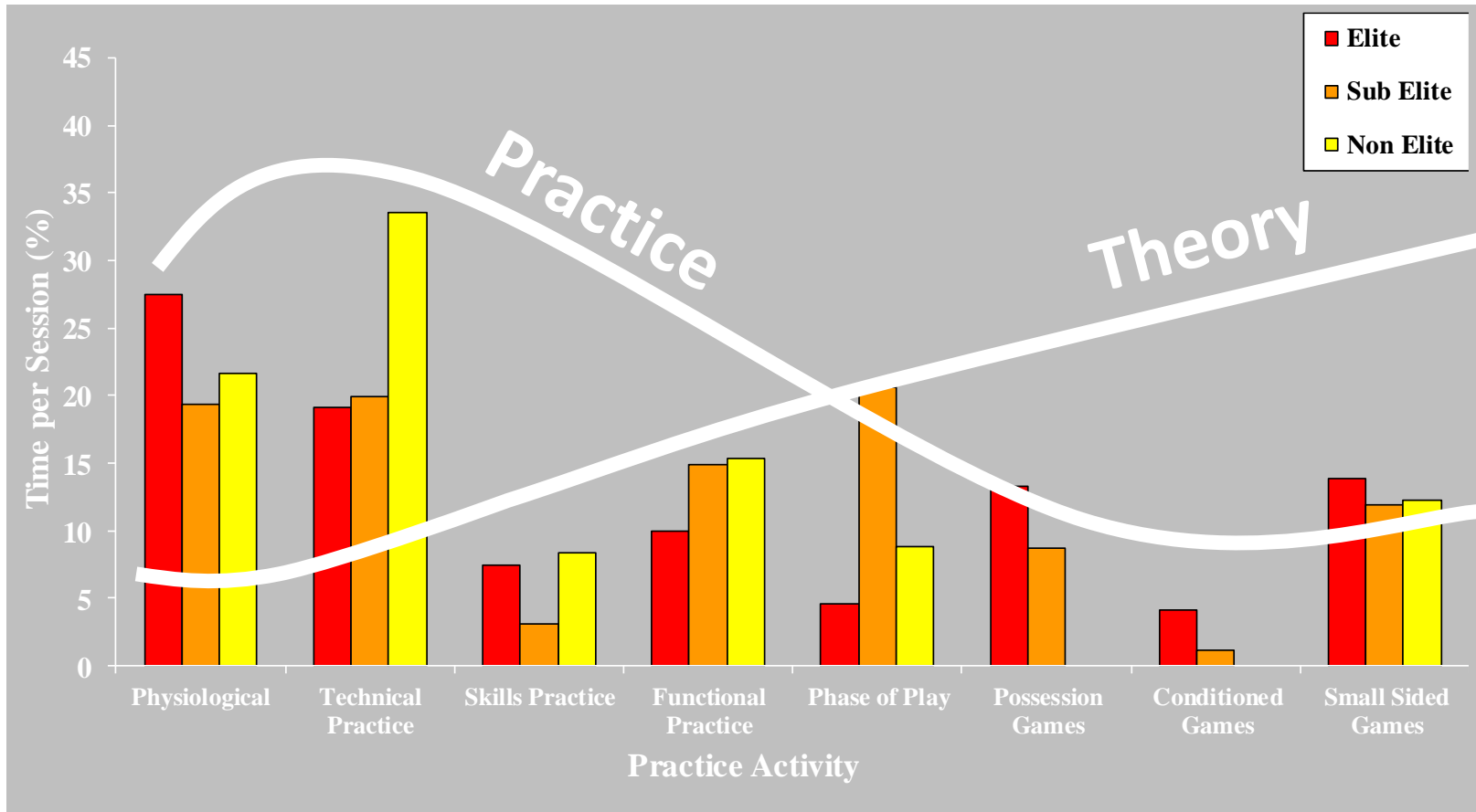
	Attempt at Goal	Blocked	Chest Height	Cross	Finish	Foot	Goal	Ground	Head	Headed	Off Target	On target	Open Play	Over Head Height	Pass	Set Play	Short Pass	Shot	Start
code 1																			
PASS		8					226									22	1		
CLEARANCE						21		20											
WALK WITH BALL																			
RUN WITH BALL																			
CROSS																			
FREE KICK				2						1						10		1	
THROW-IN																			
CORNER					4													1	
SHOT AT GOAL	4																	6	
DRIBBLE WITH BALL																			
FORWARD BALL MOVEMENTS							121												121
1 Pass Movement		3					31												31
2 Pass Movement					1		15												15
3 Pass Movement						1	9												9
4 Pass Movement							8												8
5 Pass Movement						1	7												7
6 Pass Movement							6												6
7 Pass Movement							5												5
8 Pass Movement							1												1
9 Pass Movement							1												1
10+ Pass Movement							3												3



# Time-Use Analysis of Practice

Training Form

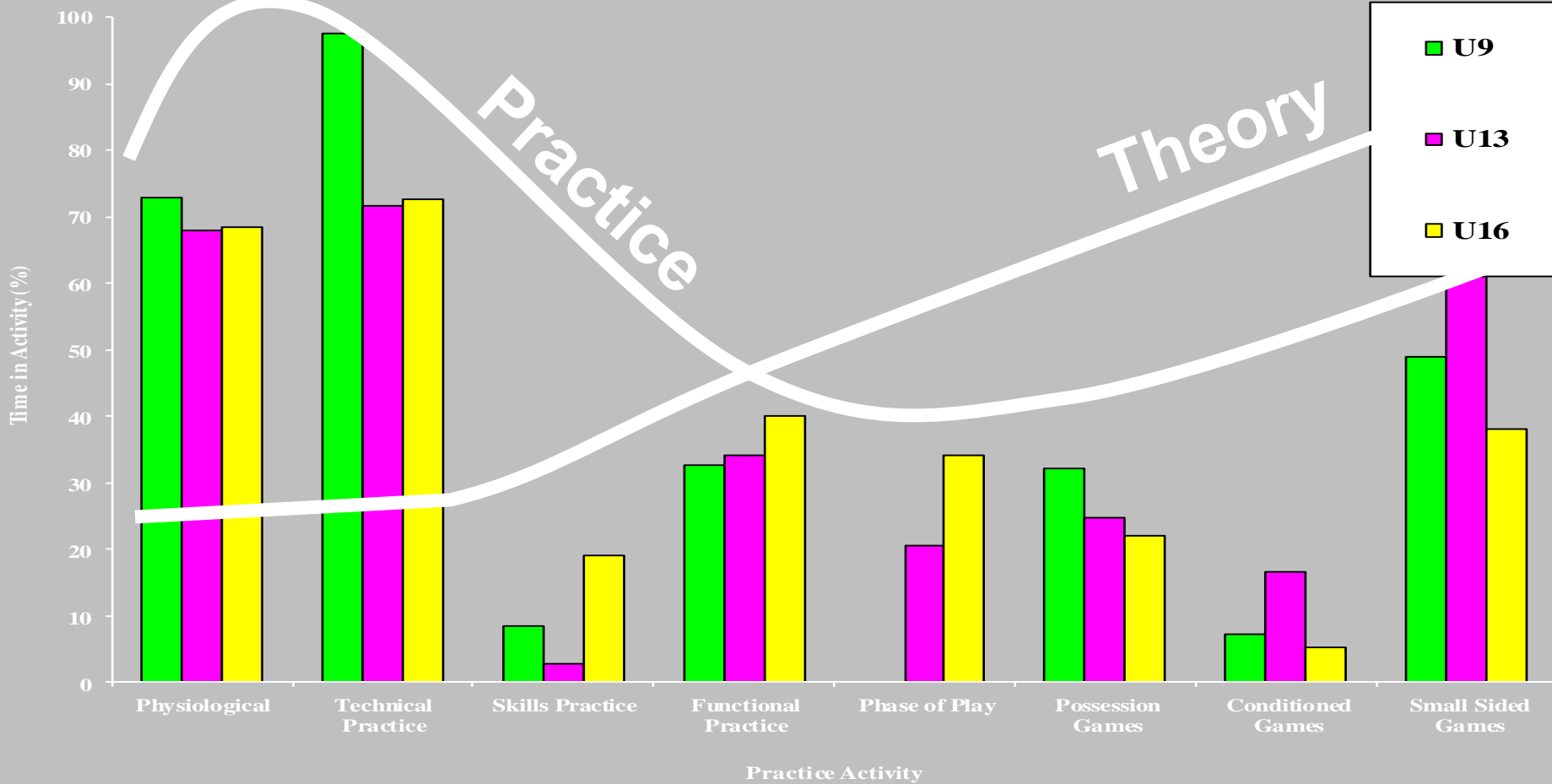
Playing Form



# Time-Use Analysis of Practice

Training Form

Playing Form



# WHAT can be analyzed?

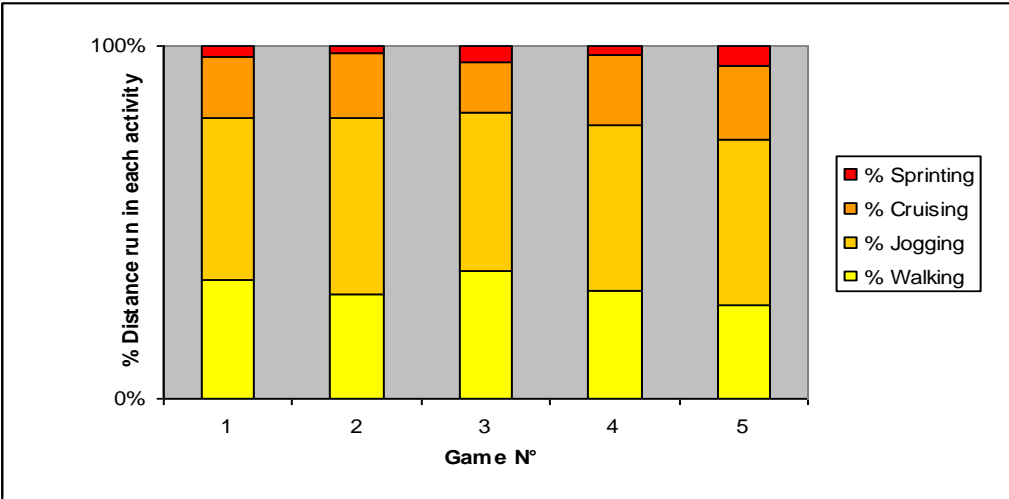
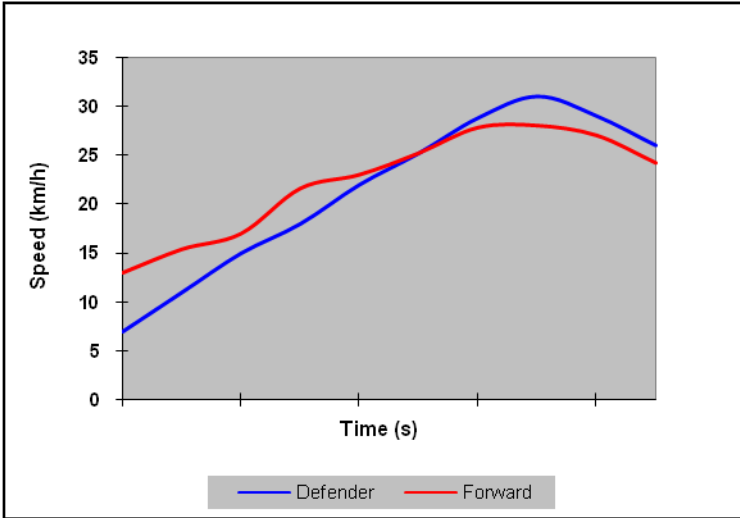
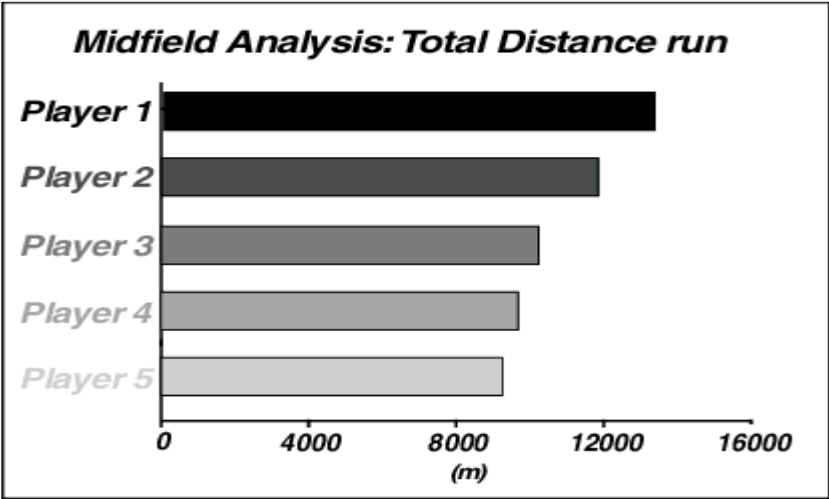
## Behavioral

- Anticipation
- Decision making
- Body language
- Communication
- Coach behaviors

## Physical

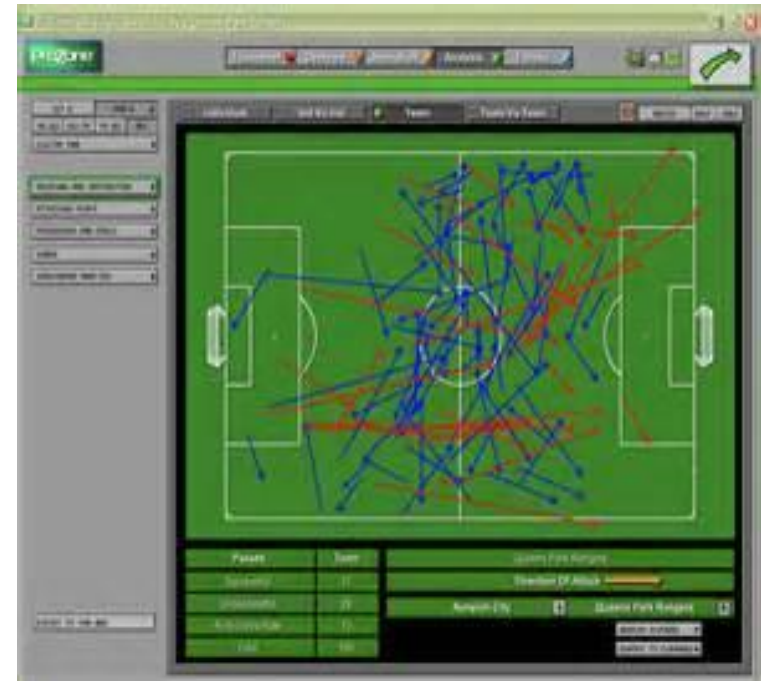
- Distance covered
- Intensity
- Pitch coverage
- Workload/tempo

# Typical Physical Data Sets





# Typical Physical Data Sets





# WHAT can be analyzed?

## Behavioral

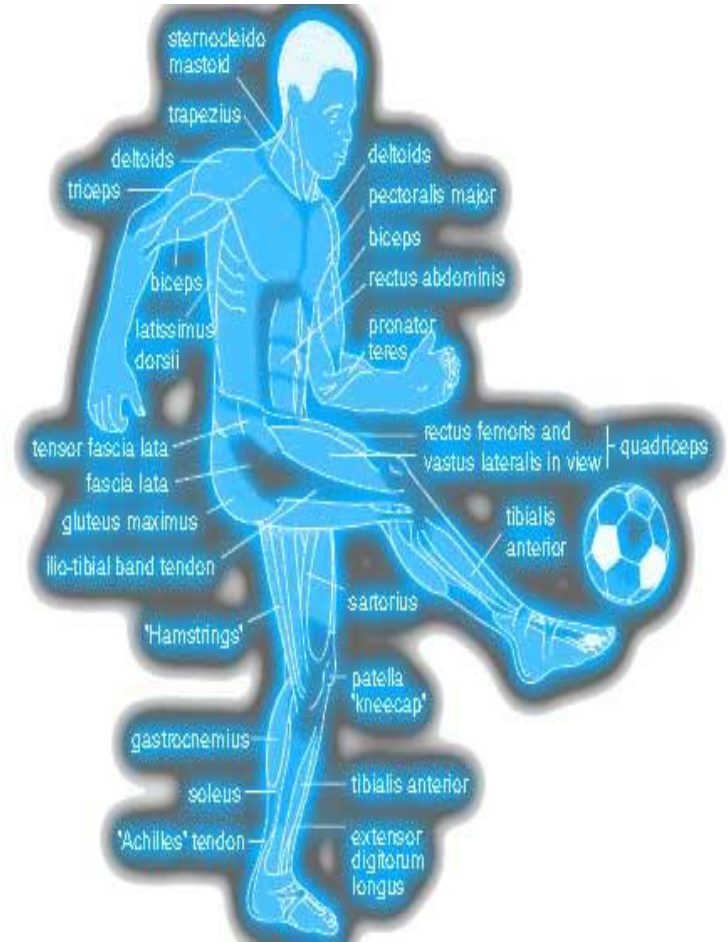
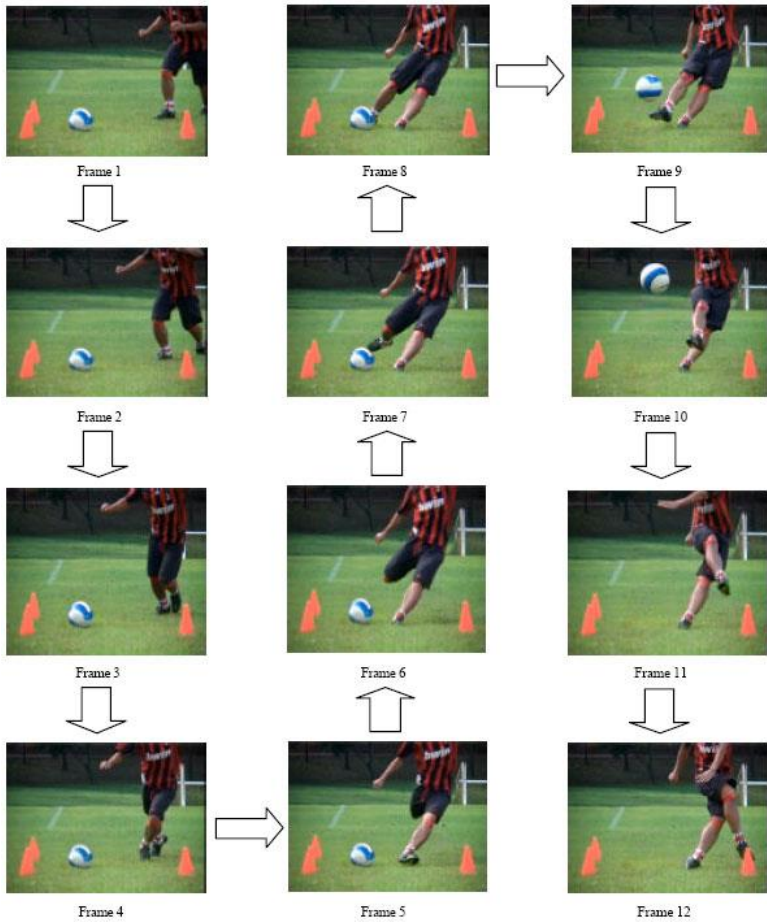
- Anticipation
- Decision making
- Body language
- Communication
- Coach behaviors

## Physical

- Distance covered
- Intensity
- Pitch coverage
- Workload/tempo

## Technical

- Technique
- Positioning



# WHAT can be analyzed?

## Tactical

- Sets plays (for and against)
- Entries into final third
- Turnover of possession
- Attempts on goal (for and against)
- Movement off the ball
- 'Shape' of back four

# WHAT should be analyzed?

“Not everything that counts can be counted,  
and not everything that can be counted  
counts”

“More is not necessarily better!”

“Added value and link to coaching process”

# WHEN to analyse?



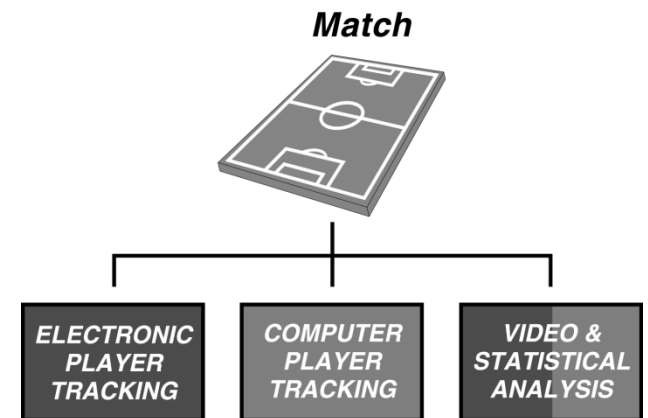
- **Opposition analysis**
- **Scouting**

- **Half-time briefing**
- **In-game decisions**
- **Review key events**

- **Actual v planned**
- **Team performance**
- **Player performance**
- **Always analyse**

# HOW to analyse?

- **Manual notation systems**
  - pen and paper
  - verbal
- **Video-based analysis**
  - analogue v digital
  - keyboard v voice activated
- **Computer-based systems**
  - automatic tracking
  - semi-automated





# **Handbook** of **Soccer** **Match Analysis**

*A systematic approach to improving performance*

Christopher Carling,  
A. Mark Williams *and* Thomas Reilly

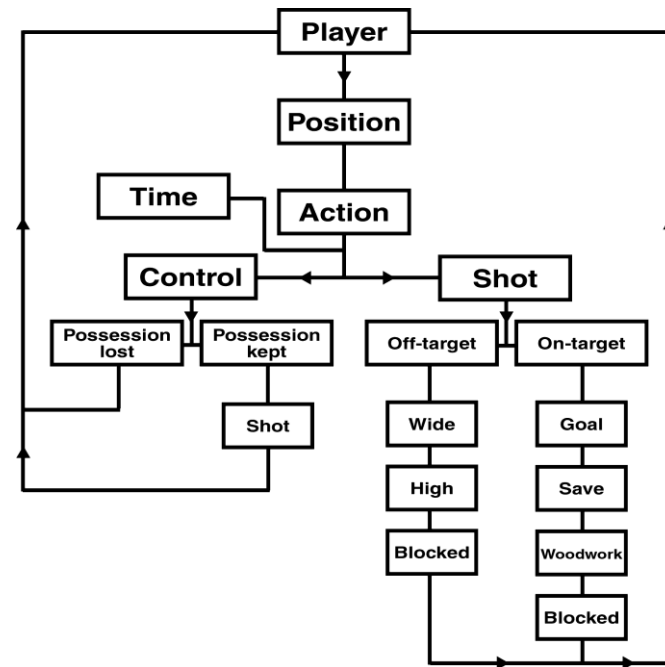
# General Principles

- **Decide what information is needed**
  - **WHAT before HOW**
  - **Prioritise data/information**
  - **Link to coaching process**



# General Principles

- Decide what information is needed
- Design system
  - Player
  - Action
  - Position
  - Time
  - Sequence



# General Principles

- Decide what information is needed
- Design system
- Collate/present data
  - Verbal
  - Visual/graphical

### Total N° Tackles Made

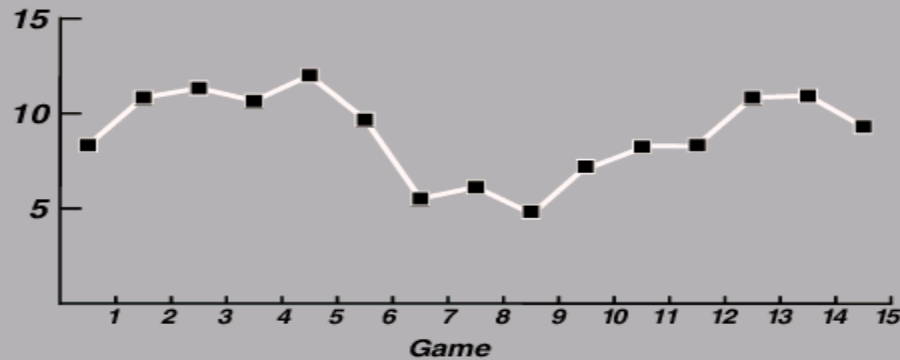
	First 10 games	Second 10 games
Player N° 8	32	28
Player N° 3	28	19
Player N° 5	15	16
Player N° 7	12	13
Player N° 4	9	6
Player N° 3	9	8
Player N° 6	7	5
Player N° 9	6	3
Player N° 11	4	8

### N° 8 Right-Midfield

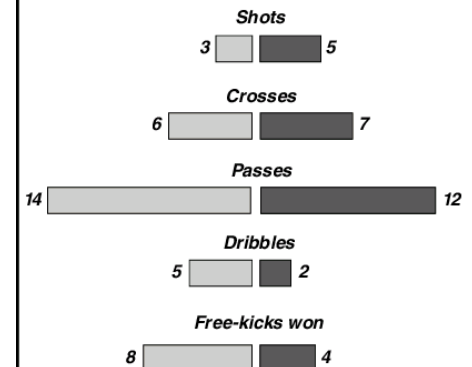
Total shots.....	10
Shots on target.....	5
% Shots on target.....	50
Goal assists.....	2
Crosses made.....	6
Fouls won.....	6

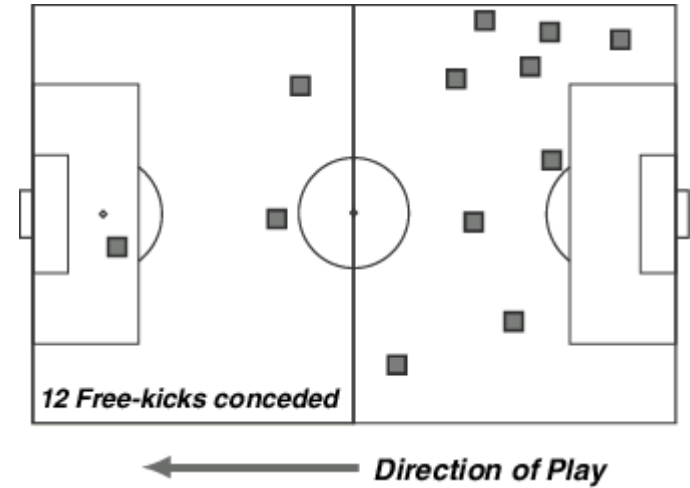
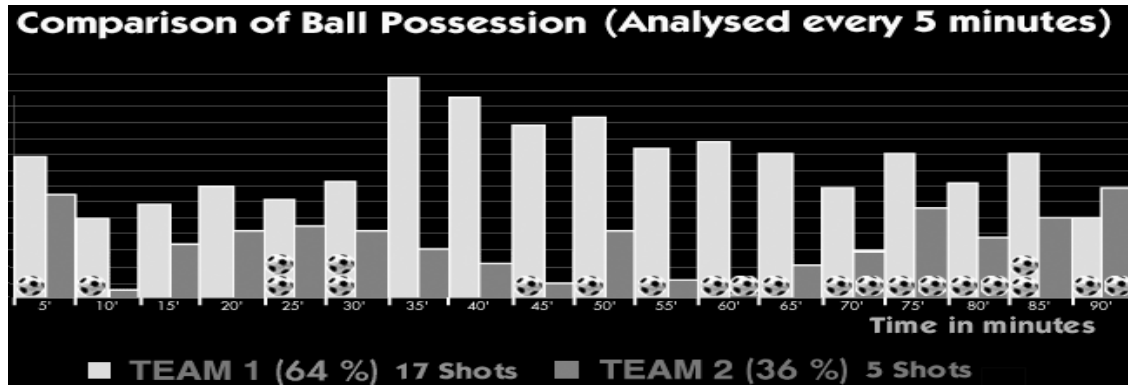
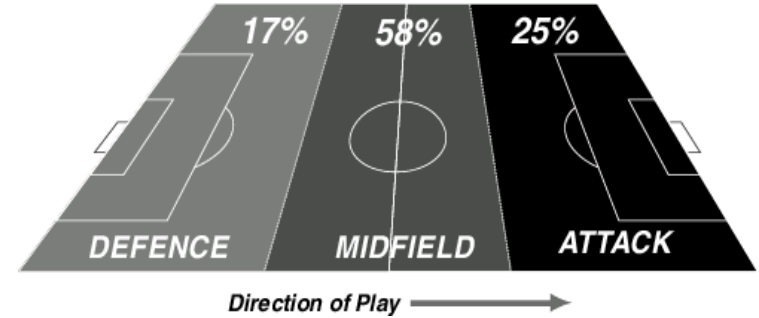
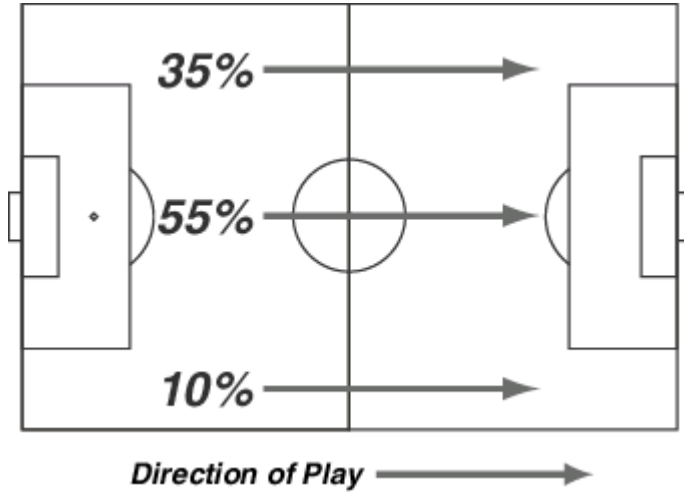
To \ From	N° 8	N° 9	N° 10	N° 11	N° 7	TOTAL
N° 8	■	4	2	3	2	11
N° 9	2	■	3	2	1	8
N° 10	4	6	■	2	1	13
N° 11	3	2	1	■	4	10
N° 7	2	1	0	3	■	6
TOTAL	11	12	6	12	11	■

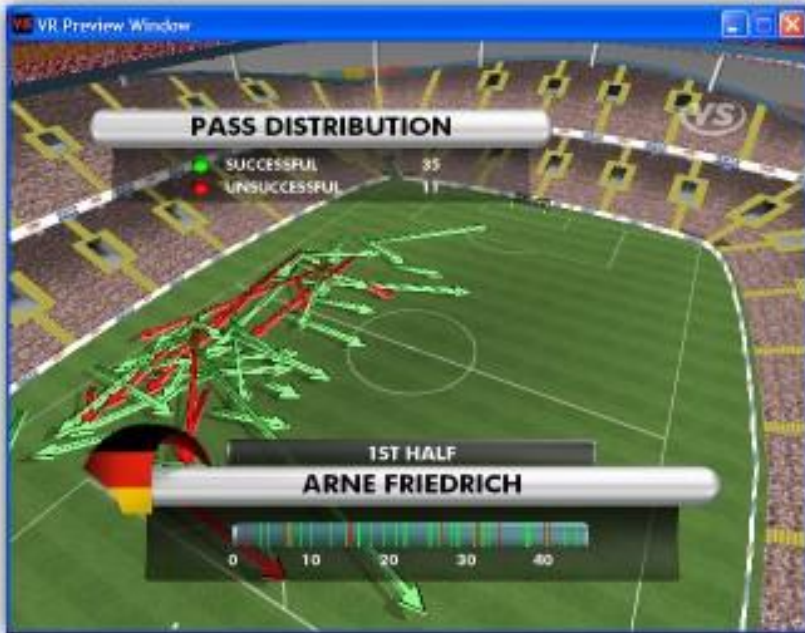
### Team Analysis: N° of shots over 15 games



### Head to Head









# Advantages

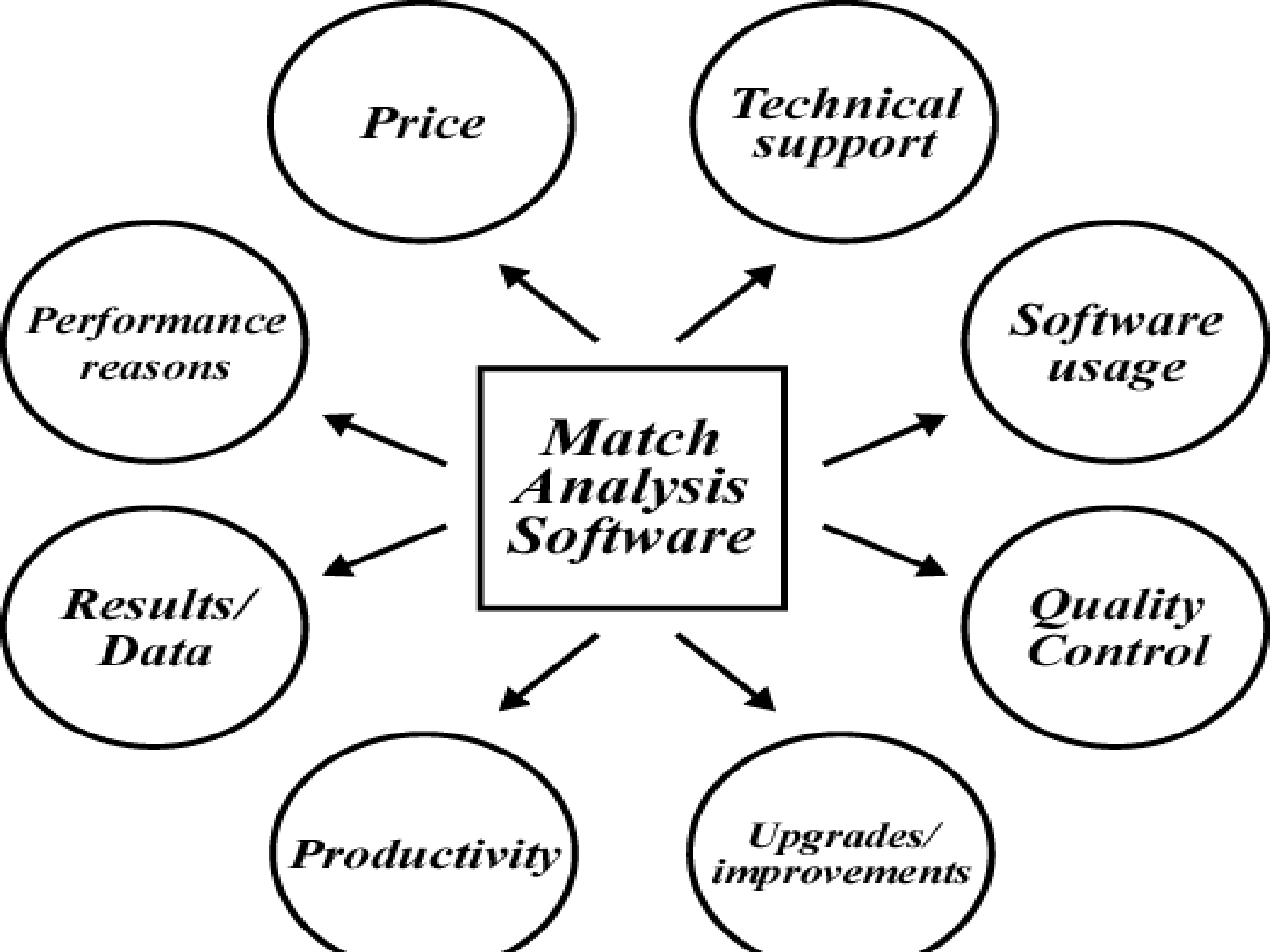
- Permanent record
- Slow-motion, real-time playback
- Capture information missed during match
- Cheap\cost-effective!
- User friendly

# General Considerations

- Accuracy – live vs. broadcast
- Objectivity – definitions/training
- Reliability – test/re-test
- Cost – time and money



<b>Company</b>	<b>Country</b>	<b>Software</b>	<b>Web Site</b>
<b>Digital Video/Statistical Analysis</b>			
Dartfish	Switzerland	DartTrainer	<a href="http://www.dartfish.com">http://www.dartfish.com</a>
Elite Sports Analysis	UK	Focus X2	<a href="http://www.elitesportsanalysis.com/">http://www.elitesportsanalysis.com/</a>
MasterCoach Int. GmbH,	Germany	MasterCoach	<a href="http://www.mastercoach.de">http://www.mastercoach.de</a>
Pinnacle Systems	USA	SportsEdit	<a href="http://www.pinnacleteamsports.com">http://www.pinnacleteamsports.com</a>
PosiCom AS	Norway	Posicom	<a href="http://www.posicom.no/">http://www.posicom.no/</a>
REM Informatique	France	StadeXpert	<a href="http://www.af-d.com/">http://www.af-d.com/</a>
Scanball	France	Scanfoot	<a href="http://www.scanball.com/">http://www.scanball.com/</a>
Softory/Sportweb	Denmark/Germany	Matchanalyzer	<a href="http://www.matchanalyzer.com">http://www.matchanalyzer.com</a>
SoftSport Inc	USA	SecondLook	<a href="http://www.softsport.com/">http://www.softsport.com/</a>
Sportstec	Australia	SportsCode	<a href="http://www.sportstecinternational.com">http://www.sportstecinternational.com</a>
Sport-Universal SA	France	AMISCO Pro Video Sequencer	<a href="http://www.sport-universal.com">http://www.sport-universal.com</a>
Touch-Line Data Systems Ltd	UK	SoccerScout	<a href="http://www.touch-line.co.uk">http://www.touch-line.co.uk</a>
Wige Media AG	Germany	Wige data	<a href="http://www.wige-mic.de">http://www.wige-mic.de</a>
<b>Video-based Player Tracking Systems</b>			
Orad	Israel	CyberSet	<a href="http://www.orad.co.il/">http://www.orad.co.il/</a>
ProZone Holdings Ltd	UK	ProZone	<a href="http://www.dalglish.pzfootball.co.uk">http://www.dalglish.pzfootball.co.uk</a>
Symah Vision	France	EPSIS Locator	<a href="http://www.epsis.com/">http://www.epsis.com/</a>
Sport-Universal SA	France	AMISCO	<a href="http://www.sport-universal.com">http://www.sport-universal.com</a>
<b>Electronic Player Tracking Systems</b>			
Cairos Technologies AG	Germany	Cairos	<a href="http://www.cairos.com">http://www.cairos.com</a>
Trakus Inc	USA	Digital Sports Information	<a href="http://www.trakus.com">http://www.trakus.com</a>



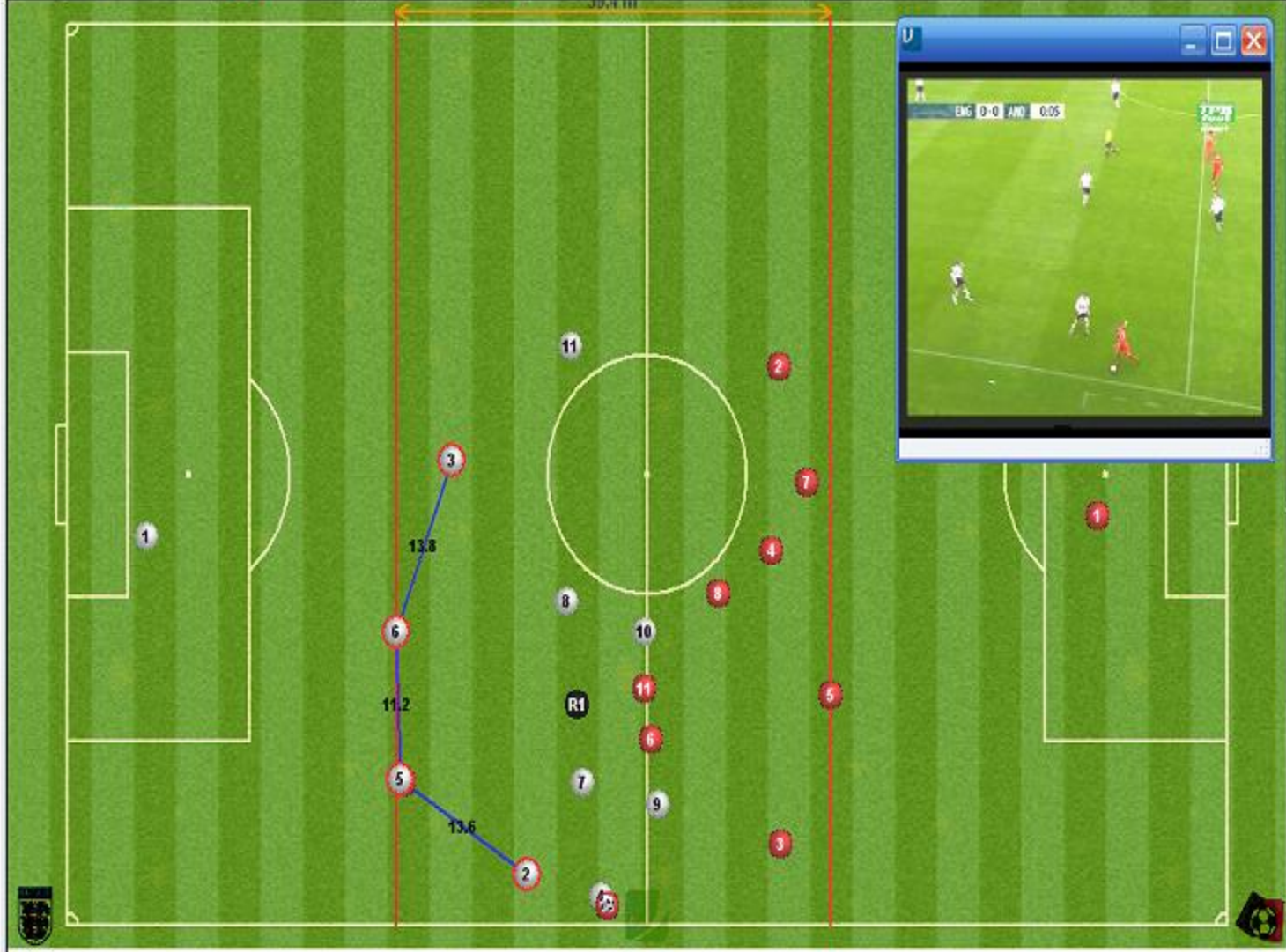
# Video-based tracking systems (Prozone, Amisco, TRACAB)



Sequence Team Player

Sequence Team A

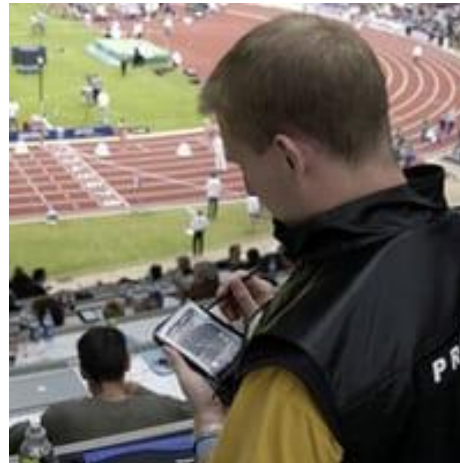
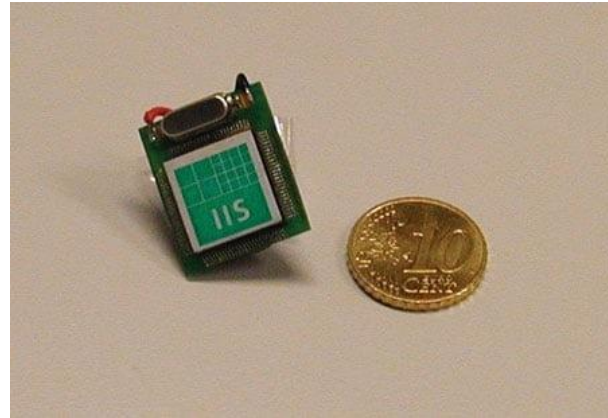
- Sequence Team A
  - In play
    - Chances
    - Goals
    - Goalkeeper - buildup
  - Set play
    - Crosses (corner and f.k.)
      - Corner
      - Free kicks
      - Throw ins
    - Shots
    - Goals



Pass - Pujol



# Computer-based tracking systems (Cairo)



# GPS Satellite Tracking



# Summary

- Performance analysis crucial
- Must feed into coaching process
- Numerous systems
  - simple v complex
  - cheap v costly
  - quick v data intensive
- Practice/on-going development essential