



Survey of Existing COTS Entertainment Titles

WP 3 - Deliverable 6

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Overview

The aim of the Serious Sports Project is to develop a game based platform that will offer the opportunity to use technology to simulate the physical conditioning, training content and structure in different (training) seasons for a European-wide competitive sport. Central to this game is reflective learning, professional development and improved competency in relation to training theory of the game player.

The primary form of interaction with the proposed game is at a high “strategic” level. Unlike simulation-style games such as the FIFA or NBA live series, which allows the game player to have control over individual team members during a soccer/ basketball/ etc. match, the Serious Sports Project game grants control over the team coach, who determines the selection of team members, the training the team engages in and the tactics they employ for each match. While the player can change tactics and make substitutions during a match, they do not have express control over the team member’s actions during the match – as per the position of a real-life coach.

The Serious Sports Project game is therefore designed to be a strategy/ management game. The educational/ learning nature of the game is designed to support the learning process for training sports/ fitness coaches in areas such as fitness training, skills training, tactics and strategies by allowing the player to analyse; training status and programmes and evaluate; the effects of the development/manipulation of fitness and skills training in strengthening and/ or weakening the attributes of a team; and the use of successful and unsuccessful tactics and strategies in a competitive match in the given sport.

Competencies in the Serious Sports Game

There are existing electronic games on the market that can be used as a template for the game development under the Serious Sports Project. Such games require careful decision making and planning to address a particular challenge. More specifically, one sports game of this genre, 'Football Manager,' requires the player to emulate a football manager and attempt to make the correct personnel, tactical and technical decisions in planning for the next series of matches / opponents.

In such games the player has many choices to make from a range of information that might include, for example, athlete information (strengths, weaknesses, fitness levels, etc.) of their own and the opposition's athletes; team formations and tactical strengths and weakness; pre-match preparations and 'in-match' decision making options.

The Serious Sports game, therefore, is envisaged as allowing the player to assume the role of an amateur basketball coach and simulate:

- Physical and sport-specific skill conditioning
- The training content and structure
- The match tactics and strategy

over the different training seasons, for a basketball team of a player-defined age and experience level.

The main aspects of the game will focus on:

- Determining the starting characteristics of the player's team in terms of age, experience, fitness and skills.
- Determining the characteristics of the team's training season.
- Training the team in terms of their:
 - Physical fitness attributes
 - Sport skill attributes

and managing these team attributes whilst avoiding over-training and under-training; and making considerations for the team's age and physical capabilities.

- Adjusting the focus and intensity of the team's training programme over time.
- Selecting the players, tactics, strategies, focus (and style) of play for each match.

During the game, the player will be provided with feedback on the effects that their training and tactics has on the team (and on individual players) – allowing them the opportunity to examine the effects of the training and tactical selection on teams of different age and experience. In addition, the player will be able to access information on the training activities and tactics which are available in the game – demonstrating how to correctly perform and implement these activities and tactics and allowing the player deeper insight into the characteristics of each of these elements, and the effects which they have on a basketball team.

The framework developed for the Serious Sports game and similar digital sports games must therefore reflect the high strategic level of information for the sport in question. To that end, the framework is designed to outline the general elements and parameters which should be identified, investigated, specified and structured in order to determine the process which the Serious Sports game should follow to achieve its aim of simulating the coaching experience for an amateur coach of a competitive sport

Framework elements

The Framework elements refer to the primary constituent sections of the framework which determine the stages and characteristics of the framework and, ultimately, the stages and characteristics of the game. These also determine how the specific elements interact with each other. These elements are the core of the framework and should not change regardless of the sport in question.

Element Number:	1
Element Title:	Coach
Element Acronym:	C
Characteristics of the Element:	
<i>Description of the element:</i>	
<p>The Coach element represents the player of the game. As such, this element is not a controllable game element, but rather represents the human interface and as such the element that controls the beginning and end of the mechanics of the game via the Coach:</p> <ul style="list-style-type: none"> • Decision-making • Personal characteristics and knowledge (technique, tactics, etc.) • Coaching philosophy • Coach-athlete dynamics • Experience (novice – expert) 	
<i>Function/ purpose of this element/ Why this element was chosen:</i>	
<p>The Coach as the human interface is the decision-making element of the game and will affect all other elements as the game progresses. The Coach element functions as the beginning and end points of the framework and is the initial point from which decisions are made and the first element of the framework, which in turn affects how all following elements are configured. The Coach element is also the end point of the framework as once a full cycle is complete, the framework returns to the Coach element to begin the process again.</p>	
<i>Connections to other elements:</i>	
<p>The Coach element interacts primarily through the selection of athletes and training undertaken, as well as selecting the strategy implemented during competitive matches.</p>	

Learning outcomes associated with this element:

The learning outcome for the Coach element is, in a sense, the result of the game as a whole as the Coach element makes the decisions involved in the framework i.e. the training, team selection and strategy – and is the recipient of the resulting information that comes from such decisions - success or failure.

- Develop an evidence based reflective approach to team selection and training.
- Understand the impact of training strategies and team selection on performance outcomes.
- Appreciate the complexities involved in team selection with particular reference to athletes' fitness/performance competencies.

Element Number:	2
Element Title:	Athlete Pool
Element Acronym:	AP
Characteristics of the Element:	
<i>Description of the element:</i>	
<p>The Athlete Pool element represents the specific profiles of available squad members that the Coach can 'work' within the game format. This element is either, in its first appearance, pre-set by the game architecture or it is set by the Coach to represent a model of 'their' team. The Coach is able to use the intra-variation within this pool to select a team for specific matches, test performance outcomes and observe changes in characteristics through training modalities and temporal processes.</p> <p>The Athletes are profiled on characteristics that relate to sporting performance, such as</p> <ul style="list-style-type: none"> • Anthropometry • Skill • Fitness attributes 	
<i>Function/ purpose of this element/ Why this element was chosen:</i>	
<p>This element provides the medium through which the Coach can assess the impact of variations in training, physical qualities and skills and has the ability to manipulate and better understand the complex dynamics that form team structure and selection.</p>	

Connections to other elements:

This element interacts with the training aspect of the game and directly influences the system potential (the emerging characteristic of each athlete after this interaction at different time periods of the season).

Learning outcomes associated with this element:

- To understand how different training modes and the balance of training elements can influence athlete development and team selection.
- To determine how team selection (based on training status) can influence the match.

<i>Element Number:</i>	3
<i>Element Title:</i>	Training
<i>Element Acronym:</i>	T
<i>Characteristics of the Element:</i>	
<i>Description of the element:</i>	
<p>This element enables the Coach to choose and implement different training modes and practices throughout the game time-line. This is underpinned by,</p> <ul style="list-style-type: none"> • Practice and practice variation • Temporal changes in the focus of training elements • The profile of the squad (Athlete Pool) available • The level of the Coach's knowledge in relation to training components. 	
<i>Function/ purpose of this element/ Why this element was chosen:</i>	
<p>The Coach is able to see the various contemporary practices that are used to train elements of performance. Furthermore, real-world performance tips (e.g. nutritional advice, periodisation details, and option scenarios) are provided to enhance learning. The effect of these training practices can be determined by the athlete's response. This will enhance the Coach's understanding of the impact of adjusting the training plans of athletes in the pool (in relation to the Coach's perceived performance profile of an athlete) on team and individual performance strategies. This incorporates planning, analysing and learning.</p>	

Connections to other elements:

This element is integral to the athlete development and as such links directly with the athlete pool. In addition, it links to the Coach in that they make a decision as to the correct training practices to employ and the interaction of all produces the system potential.

Learning outcomes associated with this element:

- Develop an in-depth appreciation of performance profiling.
- Developing skills in Planning, Analysing Learning and reflecting.
- Develop understanding across a range of fitness components.
- Planning a successful training program (movement skills).
- Identify and Develop (optimise) individual potentials.

<i>Element Number:</i>	4
<i>Element Title:</i>	System 'potential'
<i>Element Acronym:</i>	SP
<i>Characteristics of the Element:</i>	
<i>Description of the element:</i>	
<p>This element provides the Coach with the result of training which they can use to formulate a 'playing system.' Each athlete's 'potential' to be part of the selected team is shown by their respective 'scores' for each attribute. In essence, this provides a profile of the squad both before and after training and includes the judgment of the Coach in terms of athlete and strategic management.</p>	
<i>Function/ purpose of this element/ Why this element was chosen:</i>	
<p>This element allows the Coach to determine how training routines and practices have developed each athlete's attributes and then enables the Coach to decide which athletes would form the most effective team.</p>	
<i>Connections to other elements:</i>	
<p>This element forms the end of the individual athlete's preparation stage (athlete pool, training) and the beginning of the team strategy stage (strategy).</p>	
<i>Learning outcomes associated with this element:</i>	
<ul style="list-style-type: none"> • Develop skills in evaluation and reflection. 	

- Develop evidence based strategic planning skills.
- Develop evidence based decision making skills.
- Understanding of individual and team psychology (mental skills, attitudes).

Element Number:	5
Element Title:	Opposition
Element Acronym:	O
Characteristics of the Element:	
<i>Description of the element:</i>	
This element describes the characteristics of the opposition team that will play against that selected by the Coach.	
<i>Function/ purpose of this element/ Why this element was chosen:</i>	
The purpose of this element is to provide a changing stimulus to which the Coach must respond to with their team selection and subsequent strategy development. Performance analysis of opposition match-play will serve to form the strategic decisions of the Coach (e.g. formation, pattern of play, statistics associated to scores etc.). The Coach can select the type of opposition against which to play the match based on their knowledge. This selection will reflect, for example, the opposition that they are due to face in a future match.	
<i>Connections to other elements:</i>	
Links directly to the strategy that a Coach must apply	
Learning outcomes associated with this element:	
<ul style="list-style-type: none"> • Develops skills in evaluation and analysis. • Develops critical thinking skills in relation to determining opposition key qualities and how to combat them (planning). 	

Element Number:	6
Element Title:	Strategy
Element Acronym:	S
Characteristics of the Element:	
<i>Description of the element:</i>	
This element is where the Coach makes decisions on their team selection, formation	

(offensive, defensive) and tactics. In the first instance these are determined pre-match but then can be altered in-game in response to the dynamic changes in the game-play environment.

Function/ purpose of this element/ Why this element was chosen:

To enable the Coach to use variations in the elements encompassed within the strategy (mentioned above) specific to the opposition and changes in the game play environment.

Connections to other elements:

This links to the decisions made regarding squad ('Athlete Pool' element) selection, training decisions and opposition selection, i.e. the pre-game strategy to the in-game performance.

Learning outcomes associated with this element:

- Cognitive skills; reflecting, evaluating, adaptation, Decision making.
- Evidence based critical thinking skills.
- Understanding and applying of sports science; Leadership.

Element Number:	7
Element Title:	Break Play
Element Acronym:	BP
Characteristics of the Element:	
<i>Description of the element:</i>	
This element enables the Coach to change strategy at break points in the match such as timeouts, set-plays and injury breaks	
<i>Function/ purpose of this element/ Why this element was chosen:</i>	
To provide the Coach with a stimulus to adapt to the flow and characteristics of a match by assessing pattern of play, possession statistics, individual player performance statistics, number of baskets etc.	
<i>Connections to other elements:</i>	
This connects directly to the in-game strategy and level of performance of individual players.	
<i>Learning outcomes associated with this element:</i>	
<ul style="list-style-type: none"> • Decision making skills. • Critical and evidence based reflective skills. • Self appraisal in terms of strategic (including fitness profiles of players) 	

knowledge.

Element Number:	8
Element Title:	In play (comment: should we call this match?)
Element Acronym:	IP
Characteristics of the Element:	
<i>Description of the element:</i>	
The Coach is able to make rapid in-match changes to strategy and tactics.	
<i>Function/ purpose of this element/ Why this element was chosen:</i>	
This provides the Coach with an environment where they must rely on a more naturalistic decision-making process (based on rhythm / flow of the match, pattern recognition associated to pattern of play, athlete(s) performance level, score). This is one of the most critical skills for a Coach at all levels of performance.	
<i>Connections to other elements:</i>	
Links directly to in-match strategy and level of performance.	
Learning outcomes associated with this element:	
<ul style="list-style-type: none"> • Evaluation under time pressure • Critical and evidence based decision making • Rapid reflective analysis skills 	

Element Number:	9
Element Title:	Level of Performance
Element Acronym:	LP
Characteristics of the Element:	
<i>Description of the element:</i>	
Outcome ratings and information provided in relation to individual athlete and overall team performance levels. At the end of the match this information should be used to provide feedback to the Coach in a manner that identifies the best and worst characteristics of the team and individual performance(s) [Possibly in the form of an automated commentary box].	
<i>Function/ purpose of this element/ Why this element was chosen:</i>	

To enable the Coach to assess whether future changes in strategy / tactics must be implemented to improve levels of performance.

Connections to other elements:

Links directly to strategy and result.

Learning outcomes associated with this element:

- Assessment and interpretation of performance data.
- Implications for team dynamics.
- Performance evaluation and assessment of performance strengths and weaknesses.

Element Number:	10
Element Title:	Result
Element Acronym:	R
Characteristics of the Element:	
<i>Description of the element:</i>	
The outcome of the match with respect to points scored and type of points scored (2 point, 3 point etc).	
<i>Function/ purpose of this element/ Why this element was chosen:</i>	
To act as a feed forward mechanism to the next 'Coach cycle'.	
<i>Connections to other elements:</i>	
Connect back in to the game framework	
<i>Learning outcomes associated with this element:</i>	
<ul style="list-style-type: none"> • Evaluating, analysing, reflecting (on pre-, in-match decisions), planning, • Affective skills: Managing expectations. • 	

Framework Parameters

The following are parameters which apply to the framework elements. These parameters consist of information specific to the chosen game sport which will determine the options available to the user with regard to the choices available to them within the game. This information, unlike the framework elements, will change depending on the sport being played.

Parameter Number:	1
Parameter Title:	Season Information
Characteristics of the Parameter:	
This parameter refers to the typical season for the chosen sport. This will determine the typical length of time that a single season will consist of – from which month to which month – and should also determine the breakdown between the active training and competition season and the nature of time outside of this – e.g.: whether there is a pre or post season which involves training and whether these are times in which training takes place.	
Associated Elements	
C , T, SP, LP	

Parameter Number:	2
Parameter Title:	Training Information
Characteristics of the Parameter:	
This parameter refers to the typical training set-up for a season (including pre/ post season). This will determine elements such as the number of times per week the team should train for within the game, the length of each training session, the typical number of matches that should be played each season, etc.	
Associated Elements	
C, T, AP, SP, LP	

Parameter Number:	3
Parameter Title:	Sports Attributes
Characteristics of the Parameter:	
<p>This parameter refers to the typical attributes or characteristics which a player and team should possess for the chosen sport. This information should focus on what are typically considered the most important elements which players should possess to succeed within the sport. These attributes can be generally be broken down into 2 categories – physical attributes and skill-based attributes.</p> <p>A good indication of this information is what typical training in this sport aims to achieve – e.g.: which aspects of the athlete this information aims to improve.</p>	
Associated Elements	
AP, T, SP, O, S, BP, IP, LP, R	

Parameter Number:	4
Parameter Title:	Training Activities
Characteristics of the Parameter:	
<p>This parameter refers to the typical training activities which the player/ coach can have the virtual players perform in order to improve their individual and team attributes. These training activities should be based on the sports attributes parameter. Information for each item (e.g.: training activity) in this parameter should include its effects within the game – e.g.: the name of the activity, how long it takes to perform and how it affects the attributes parameter for a player.</p> <p>In addition to information to aid the parameter as a game mechanic (for increasing attributes), information for this parameter should include a number of information items for inclusion as an educational tool – e.g.: a description of the training activity, the typical steps involved, advantages and disadvantages and other relevant information.</p>	
Associated Elements	

T, SP, S, BP, IP, LP, R

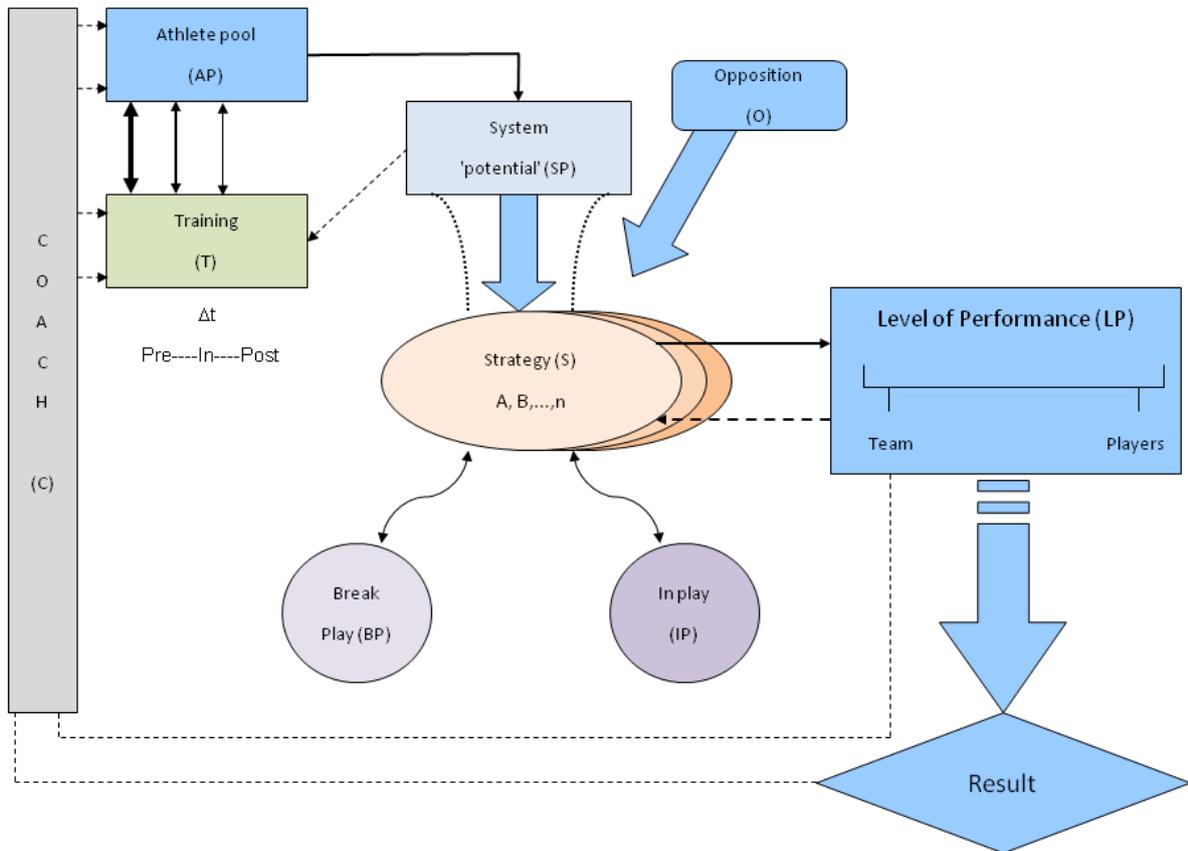
Parameter Number:	5
Parameter Title:	Match Tactics
Characteristics of the Parameter:	
<p>This parameter refers to the typical tactics which a player/ coach can apply within a match scenario in the game in order to improve their team's chance of success. These training activities should be based on the typical tactics applied within the chosen sport. Information for each item (e.g.: tactic) should include its effects within the game – in particular, the advantage or disadvantage which a chosen tactic will have over the opposition's chosen tactic, and the advantage/ disadvantage which a team gains from possessing superior/ inferior attributes .</p> <p>In addition to information to aid the parameter as a game mechanic (to aid in determining victory), information for this parameter should include a number of information items for inclusion as an educational tool – e.g.: a description of the tactic, advantages and disadvantages and other relevant information.</p>	
Associated Elements	
O, S, BP, IP, LP, R	

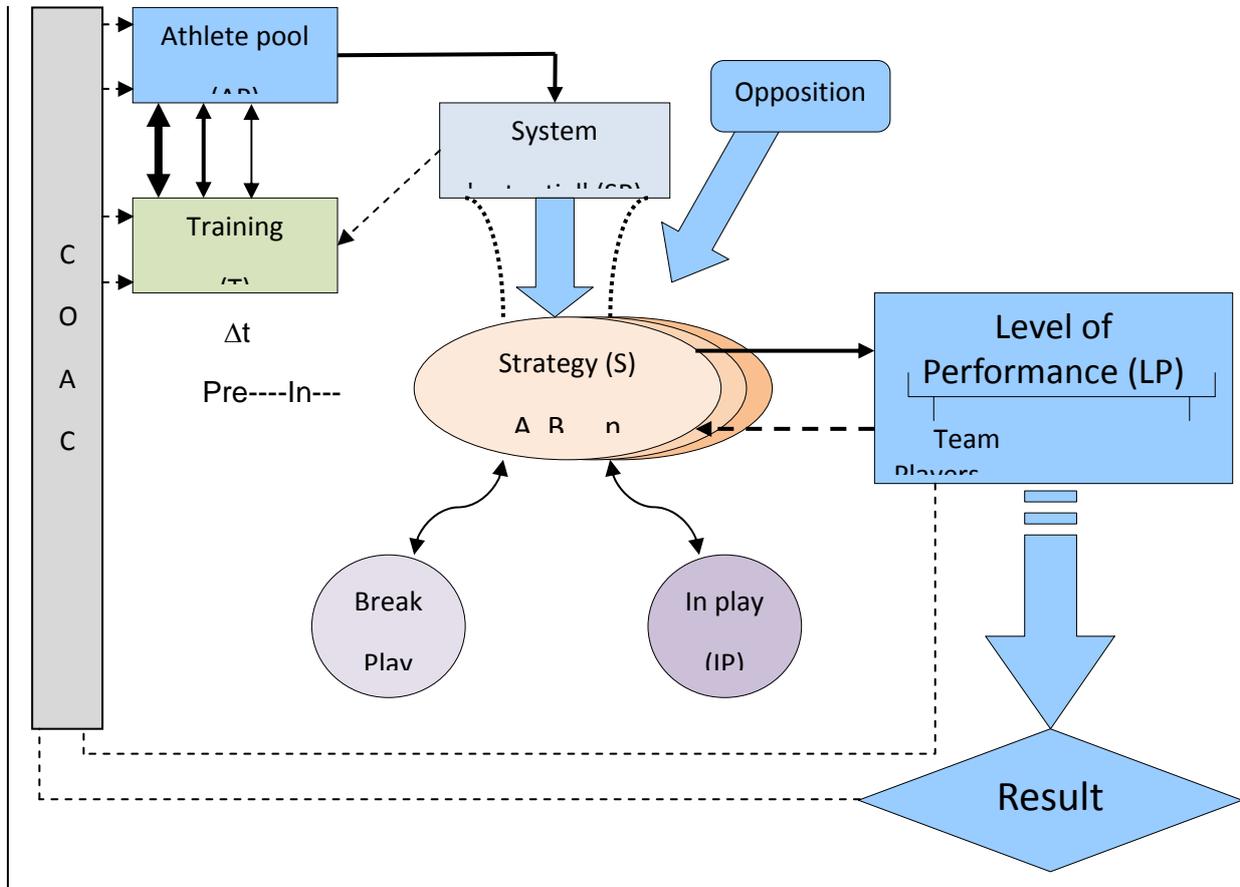


D6 Framework for Serious Sports game development

Framework Structure

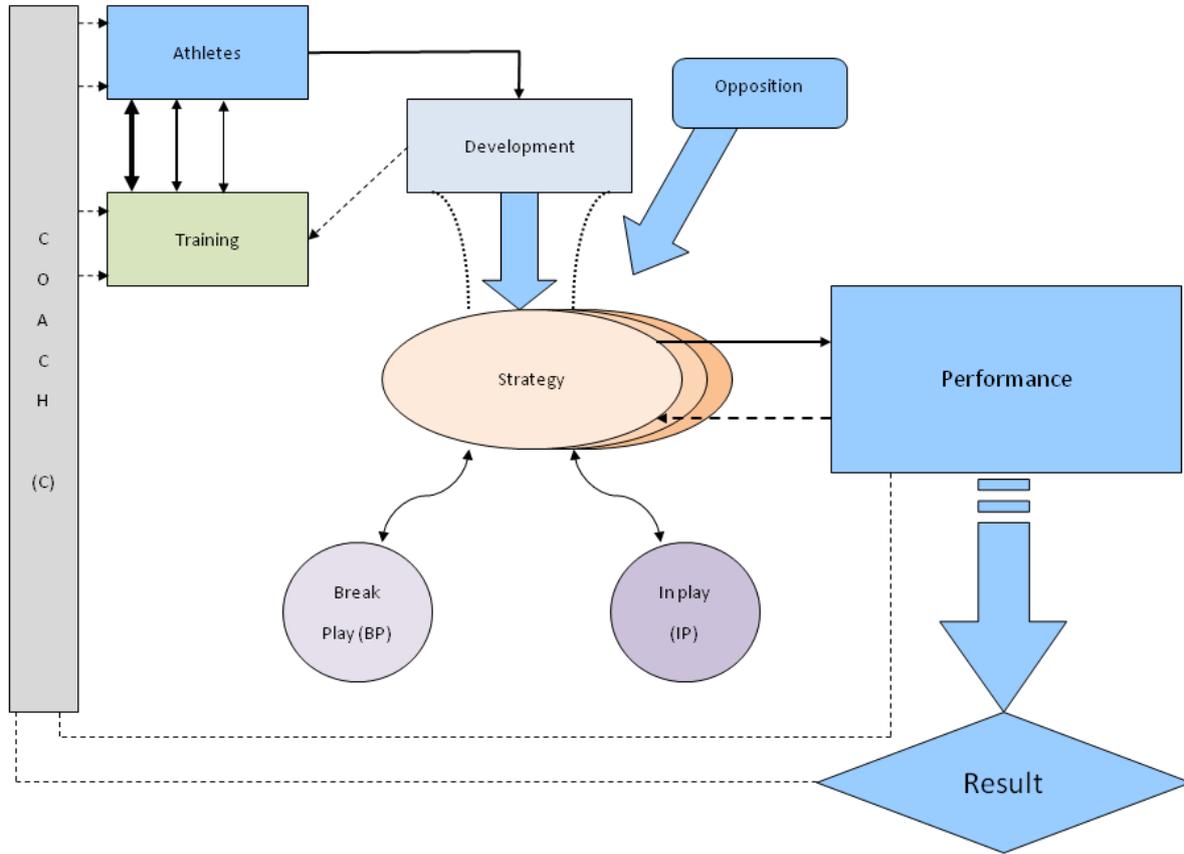
This diagram demonstrates the interconnection between the elements of the framework.





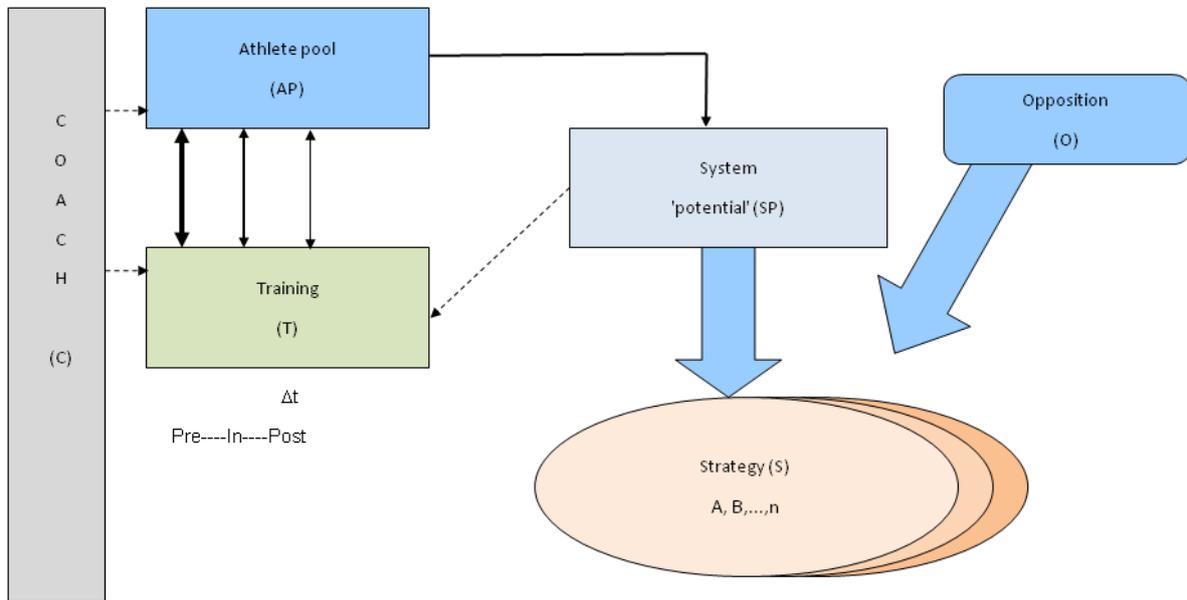
Serious Sports Framework

An alternative, simpler variation of this framework can also be described as follows:



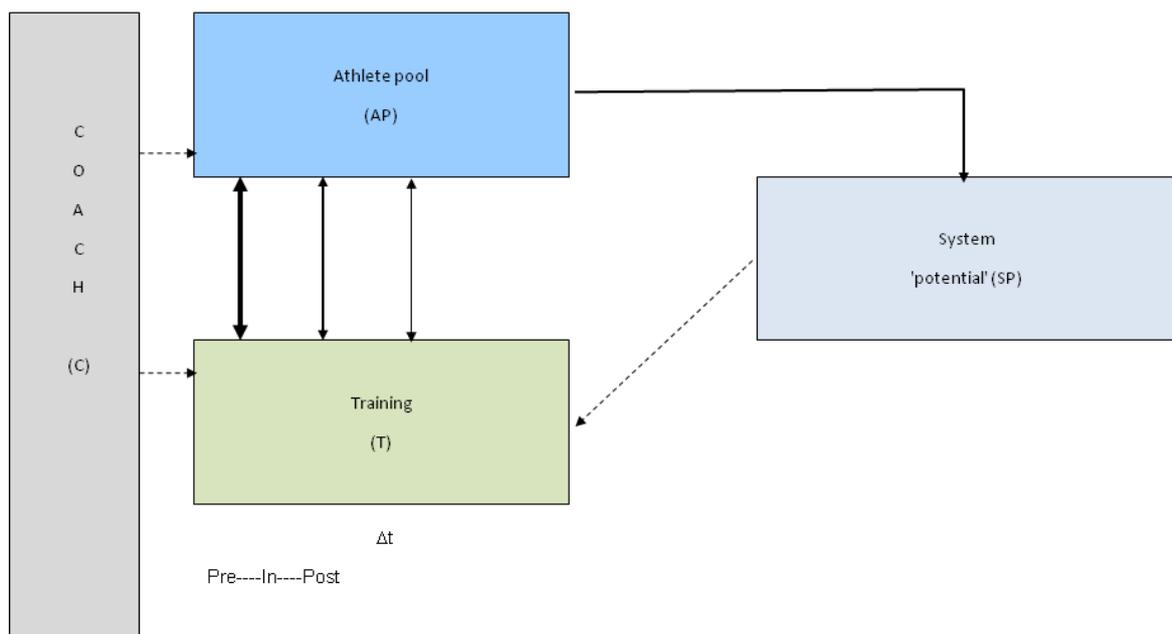
Simplified Serious Sports Framework

Alternatively, an even more simplified version of the framework, focusing on training and strategy, can be described as follows:



Serious Sports Framework w focus on training & strategy

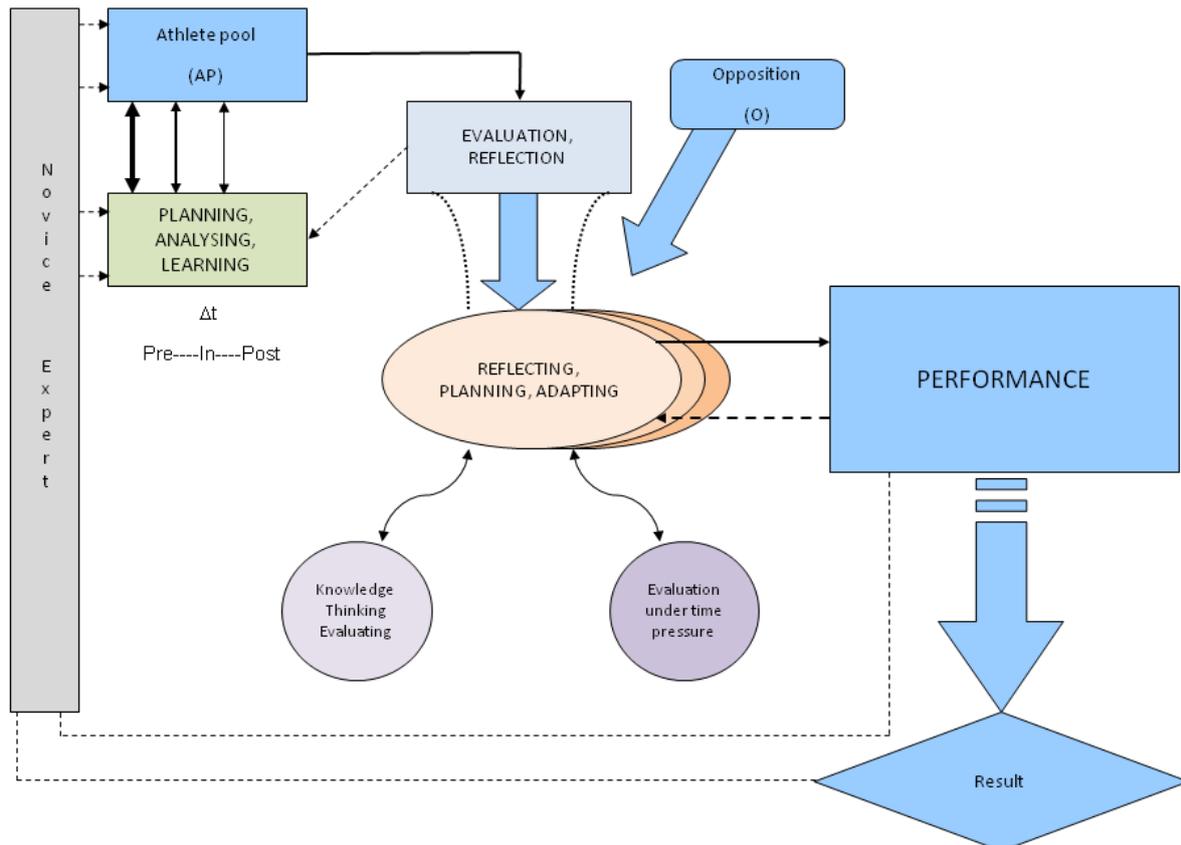
An even more basic version of the framework, focusing specifically on training elements, can be described as follows:



Serious Sports Framework w focus solely on training

Learning Framework

Competencies of the framework based on Sternberg (1999) and Bloom (1956)

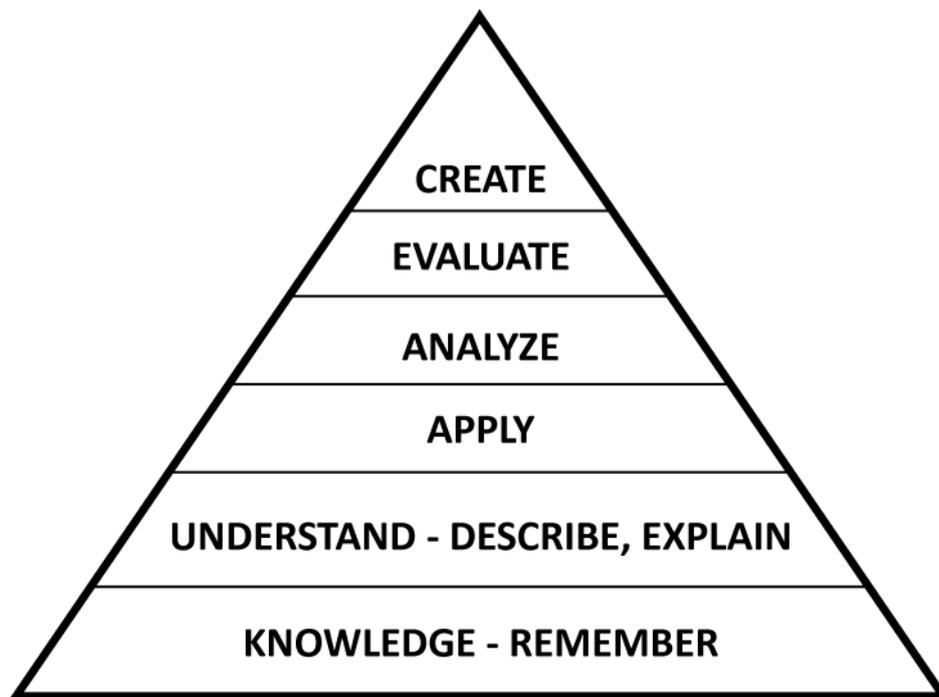


Serious Sports Framework – Based on Bloom’s Taxonomy

The above diagram demonstrates a point of view of the framework based on the competencies of Sternberg (1999) and Bloom (1956).

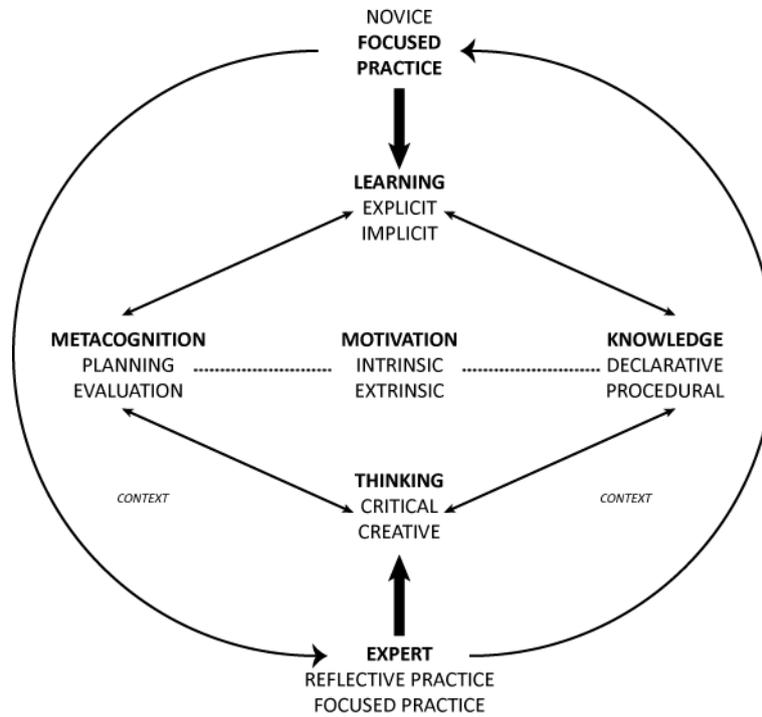
In Bloom’s Taxonomy of educational objectives (1956), Bloom classified educational goals in terms of complexity, with the aim of improving communication and practice among educators. The Serious Sports framework reflects the cognitive elements contained in Bloom’s taxonomy which commonly occur in educational setting. The learning involved at each step can be referenced in the cognitive domain of Bloom’s

taxonomy and, more specifically, Bloom's revised taxonomy (Anderson, L.W. & Krathwohl, D.R. (Eds.) (2001). *Taxonomy for Learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives*. New York: Addison Wesley Longman) which reflects a more active form of thinking and is perhaps more accurate for the purposes of this framework.



Bloom's Revised Taxonomy categories

In addition, the framework also reflects the concepts and circular process contained in Sternberg's Developing Expertise Model which describes the process of how reflective and focused practice, informed by metacognitive activities and existing knowledge leads to critical and creative thinking which returns to the learning process.



Sternberg's Developing Expertise Model

Updates

Updates to this framework could be recommended for consideration after the project life of the Serious Sports Project. Additional updates to the framework have been discussed by the consortium and could include:

1. Coaching attributes

<i>Coaching attributes</i>	
Psychology	Coaching style
Communication	Command
Motivating athletes	Submissive
Behaviour management	Co-operative

2. Feedback: conditional test results (data) of physical, with graphical analysis.

3. Recommendation of nutrition, such us:

- a. Hydration
- b. Pre-exercise feeding
- c. Recovery feeding
- d. In-exercise feeding.