

Computer Based Training on How to Play Billiards-An Application of Multimedia

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Abstract

The topic of the computer based training package (CBT) is “How To Play Billiards”. Billiard is very popular and international game played all over the world in different forms with different rules. Macromedia Flash 5.0 and Macromedia Director 8.5 are used to develop the CBT. Three basic chapters like “Introduction to billiards”, “Equipments of billiards” and “Basic rules of billiards” are incorporated in this CBT with support of voice over to explain the game. These chapters are provided with animated depiction of events. They are explained with the help of animated examples. Some basic question answer sessions, drag and drop section as well as interactivities to tackle some situations in the billiard board at the time of playing the game in the CBT to give a platform for both way communication and better understanding. Most of the animations are designed by Macromedia Flash 5.0. Macromedia Director 8.5 is used to join the scenes that are created by using Macromedia Flash 5.0.

Keywords: *Billiards, Balkline, Carom billiards, Straight Rail, Balkline, Pool billiards, Eight ball, Nine ball, Bank pool, Snooker, Legal break, Open Table, Push out shot, Combination shot, Free ball state, Foul penalty.*

I. INTRODUCTION

The CBT is made to impart the concepts of Billiards game with some interactive examples. Simultaneously, it is conceptualized with an idea to make the topic interesting, easily conceivable and attractive. Although billiards game has so many different rules for different types of the game, in this CBT it is tried to make up the topic simple and lucid. Precisely, it provides an introductory example and tutorial of this very branch. The chapters are made with animated demonstration, in order to make a learner understand the lesson in a better way than that of textual description. The learner will be provided with testing session, solving which, he/she will be able to test his/her understanding of the learnt principles.

A perceptive person, after going through the CBT, solving the exercises provided with the study materials and absorbing the given and recommended reference resources, would be expected to acquire necessary skills to be able to

- Interpret the basic concepts of billiards.
- Identify different types of billiards.
- Explain the equipments of different types of billiards.
- Explain basic rules of billiards that a player should follow at the time of playing the game.

Target audience of the CBT will be:

- People who want to know about billiards.
- Players participating in the event of billiards.

II. RELATED WORKS

A survey on billiards game[1,2,3,4] reveals that it is a very interesting game with specific rules for its different types. A CBT on how to play billiards will certainly attract the users to play the game on computer and gather real life experience of playing billiards physically on board. Design of the CBT requires skills on softwares like Flash MX [17,21] and Director 8.5 rules & scripts[6,9,18,19,20]. Sound skills on multimedia[5] and computer graphics[16] are also required for design of the CBT. The game implies different categories like pool billiards[23,28] with a set of specific rules, snooker[24] with another set of rules etc.. The CBT will guide a user to play various types of billiards without having any practical experience of playing billiards.

III. SYSTEM REQUIREMENTS

Software Requirements

▪ Development

- Adobe Photoshop 6.0
- Macromedia Flash 5.0
- Macromedia Director 8.5
- Sound Forge XP 4.0
- Microsoft Visual Basic 6.0
- Windows 98 or higher versions of Operating System.
- Microsoft Office 2000

▪ User

- Windows 9X/XP platform

Hardware Requirements

▪ Development

- Pentium 4, 3 GHz processor
- Intel Original Motherboard
- 256 MB RAM
- 40 GB Secondary Memory
- SVGA Graphics Card
- CD R/W
- Microphone
- Speakers
- Color Monitor

▪ User

- Pentium 3, 433 MHz processor
- 128 MB RAM
- Motherboard
- 1 GB Secondary Memory
- SVGA Graphics Card
- CD ROM
- Speakers
- Color Monitor.

IV. DESIGN METHODOLOGY

Story:

Introduction to billiards:

This chapter describes the introduction to billiards game including history of billiards, value of the game as a sport event and its different types.

History:

Historically, the umbrella term was **billiards**. While that familiar name is still employed by some as a generic label for all such games, the word's usage has splintered into more exclusive competing meanings among certain groups and geographic regions. In the United Kingdom, "billiards" refers exclusively to English billiards, while in the United States it is sometimes used to refer to a particular game or class of games, or to all cue games in general, depending upon dialect and context.

Billiards as sports event:

At least the games with regulated international professional competition have been referred to as "sports" or "sporting" events, not simply "games", since 1893 at the latest. Quite a variety of particular games (i.e. sets of rules and equipment) are the subject of present-day competition, including many of those already mentioned, with competition being especially broad in nine-ball, snooker, three-cushion and eight-ball.

Snooker, though technically a pocket billiards variant and closely related in its equipment and origin to the game of English billiards, is a professional sport organized at the international level, and its rules bear little resemblance to those of pool games.

A "Billiards" category encompassing pool, snooker and carom was featured in the 2005 world games, held in Germany, and the 2006 ASIAN games also saw the introduction of "cue sports" as an important event.

Different types:

There are three major subdivisions of games within cue sports:

- **Carom billiards:** This refers to games played on tables without pockets, including among others balkline and straight rail are well known carom billiards.

Straight rail(or Straight billiards): Straight rail, sometimes referred to as carom billiards, straight billiards, the three-ball game, the carambole game, and the free game in Europe.

The object of straight rail is simple: one point, called a "count", is scored each time a player's cue ball makes contact with both object balls (the second cue ball and the third ball) on a single stroke.

Balkline: In the balkline games, rather than drawing balklines a few inches from the corners, the entire table is divided into rectangular balk spaces, by drawing balklines a certain distance lengthwise and widthwise across the length of the table a set number of inches parallel out from each rail. This divides the table into eight rectangular balkspaces. Additionally, rectangles are drawn where each balkline meets a rail, called *anchor spaces*, which developed to stop a number of nursing techniques that exploited the fact that if the object balls straddled a balkline, no count limit was in place

- **Pocket billiards (or "pool"):**This type of billiards are generally played on a table with six pockets, including among others eight-ball (the world's most widely played cue sport), nine-ball and bank pool.

Eight ball: The billiards game shall be known as 8 Ball Pool is a game played with a cue ball and fifteen object balls, numbered 1 through 15. One player must pocket balls of the group numbered 1 through 7 (solid colors), while the other player has 9 through 15 (stripes).

Nine ball: The billiards game shall be known as 9 Ball Pool is a game played with a cue ball and 9 object balls, numbered 1 through 9. One player legally pocketing the 9 ball may win the frame. In this game the object ball will be the lowest numbered ball in the present board condition.

Bank pool: Bank pool has been gaining popularity in recent years. Bank pool can be played with a full rack (can be a *long* game), but is more typically played with nine balls (frequently called "nine-ball bank").

- **Snooker:** While technically a pocket billiards game, it is generally classified separately based on its historic divergence from other games, as well as a separate culture and terminology that characterize its play. It calculates car arrival distributions at an intersection and derives estimations of delays and queue lengths. This theory cannot model the coordinating effects of the interaction between various intersections, and it has further limitations when traffic is dense (when the average flow exceeds the average capacity for a certain time interval, and no stochastic equilibrium exists).

Equipments of billiards:

Billiard balls:

Billiard balls vary from game to game, in size, design and number. **Carom** billiards balls are larger than **pool** balls, and come as a set of **two cue balls** (one colored or marked) and an object ball (or two object balls in the case of the game four-ball). American-style pool balls, used in any pool game and found throughout the world, come in sets of two suits of object balls, seven solids and seven stripes, an 8 ball and a cue ball; the balls are racked differently for different games (some of which do not use the entire ball set). **Snooker** balls are also smaller than American-style pool balls, and come in sets of 22 (15 reds, 6 "colours", and a cue ball). Other games also have custom ball sets, such as Russian pyramid and bumper pool.

Billiard balls have been made from many different materials since the start of the game, including clay, bakelite, celluloid, crystalite, ivory, plastic, steel and wood.

Tables:

There are many sizes and styles of pool and billiard tables. Generally, tables are rectangles twice as long as they are wide. Most **pool tables** are known as 7-, 8-, or 9-footers, referring to the length of the table's long side. Full-size **snooker and English** billiard tables are 12 feet (3.7 m) long on the longest side. Pool halls tend to have 9-foot (2.7 m) tables and cater to the serious pool player. Pubs will typically use 7-foot (2.1 m) tables which are often coin-operated. Formerly, 10-foot (3 m) tables were common, but such tables are now considered antique collectors items; a few, usually from the late 1800s, can be found in pool halls from time to time. Ten-foot tables remain the standard size for carom billiard games.

High quality tables are mostly 4.5 by 9 ft (2.7 m). (interior dimensions), with a bed made of three pieces of thick slate to prevent warping and changes due to humidity

Cloth:

All types of tables are covered with billiard cloth (often called "**felt**", but actually a woven wool or wool/nylon blend called **baize**). Bar or tavern tables, which get a lot of play, use "slower", more durable cloth. The cloth used in upscale pool (and snooker) halls and home billiard rooms is "faster". The cloth of the billiard table has traditionally been green, reflecting its origin (originally the grass of ancestral lawn games), and has been so colored since the 16th century.

Rack:

A rack is the name given to a frame (usually **wood** or **plastic**) used to organize billiard balls at the beginning of a game. This is traditionally triangular in shape, but varies with the type of billiards played.

There are two main types of racks; the more common triangular shape which is used for eight-ball and straight pool and the diamond shaped rack used for nine-ball.

Cues:

Billiards games are mostly played with a **stick** known as a cue. A cue is usually either a one piece tapered stick or a two piece stick divided in the middle by a joint of metal or phenolic resin. High quality cues are generally two pieces and are made of a hardwood, generally **maple** for billiards and **ash** for snooker. The **butt** end of the cue is of larger circumference and is intended to be gripped by a player's hand. The shaft of the cue is of smaller circumference, usually tapering to an 0.4 to 0.55 inch (11–14 mm) terminus called a ferrule (usually made of fiberglass or brass in better cues), where a rounded leather tip is affixed.

Mechanical bridge:

The mechanical bridge, sometimes called a "rake" (among other nicknames), "bridge stick" or simply "bridge", "rest" in the UK, is used to extend a player's reach on a shot where the cue ball is too far away for normal hand bridging. It consists of a stick with a grooved metal or plastic head which the cue slides on. Many amateurs refuse to use the mechanical bridge based on the perception that to do so is unmanly. However, many aficionados and most professionals employ the bridge whenever the intended shot so requires. Some players, especially current or former snooker players, use a screw-on cue butt extension instead of or in addition to the mechanical bridge.

Chalk:

Chalk is applied to the tip of the cue stick, ideally before every shot, to increase the tip's friction coefficient so that when it impacts the cue ball on a non-center hit, no miscue (unintentional slippage between the cue tip and the struck ball) occurs. Cue tip chalk is not actually the substance typically referred to as "**chalk**" (generally **calcium carbonate**, also known as calcite or carbonate of **lime**), but any of several proprietary compounds, with a silicate base. "Chalk" may also refer to a cone of fine, white **hand chalk**; like talc (talcum powder) it can be used to reduce friction between the cue and bridge hand during shooting, for a smoother stroke. Some brands of hand chalk actually are made of compressed talc. (Tip chalk is not used for this purpose because it is abrasive, hand-staining and difficult to apply.) Many players prefer a slick pool glove over hand chalk or talc because of the messiness of these powders; buildup of particles on the cloth will affect ball behavior and necessitate more-frequent cloth cleaning.

Basic rules of billiards:

One player must know the basic rules of billiards before playing the game on board. Although the game represents so many rules for different types here in this CBT only rules of three major types of billiards has been depicted for making the CBT short and simple. The major types are:

- 8-ball billiards
- 9-ball billiards
- Snooker

- **Eight ball billiards:**

Requirements of the Game:

The billiards game shall be known as 8 Ball Pool is a game played with a cue ball and fifteen object balls, numbered 1 through 15. One player must pocket balls of the group numbered 1 through 7 (solid colors), while the other player has 9 through 15 (stripes). In our game it is played on 9 foot Tournament billiard table, with play field size 4.5 X 9 foot = 50 inches by 100 inches; the balls used are 57,2 mm diameter.

Object of the Game:

One player must pocket balls of the group numbered 1 through 7 (solid colors), while the other player has 9 thru 15 (stripes). The player pocketing their group of object balls first in any order and then legally pocketing the 8-ball (black) in any pocket wins the game. Any other time the 8-ball is pocketed it is spotted at the foot spot, all other pocketed balls remain pocketed.

Legal Break shot and re-break:

The breaker with the cue ball behind the head string must either pocket a numbered ball or drive at least four numbered balls (other than the cue ball) to the rail. Failure to do this is forcing the breaker to re-break in all cases; all other aspects of the shot are ignored and the shot is not a break. If the conditions described above are observed, it is a Legal Break shot and the table is open.

Special rule: five failed re-breaks is a loss of game.

Scratch on the Legal Break shot:

If the player pockets the cue ball from the Legal Break shot, it is a foul. The table is still open, all numbered balls pocketed remain pocketed (with the exception of the 8-ball spotted) and the incoming player has cue ball in hand behind the head string.

The cue ball in hand behind the head string :

With cue ball in hand behind the head string player may not shoot an object ball that is behind the head string, unless he first shoots the cue ball past the head string and causes the cue ball to come back behind the head string and hit the object ball.

It is permissible bank the cue ball off a rail before contacting an object ball behind the head string, but the cue ball must hit the rail behind the head string at the first.

The 8-ball pocketed on the Legal Break:

If the player pockets the 8-ball (black) from the Legal Break shot, no foul shall be incurred, the 8-ball spotted and the breaker continue shooting.

If the breaker scratches while pocketing the 8-ball on the break, the incoming player having the 8-ball spotted and begin shooting with ball in hand behind the head string.

Open Table:

This means that the table is "open" when the choice of groups (stripes or solids) has not yet been determined. The table is always open immediately after the Legal Break shot. When the table is open, any ball can be legally hit without resulting in a foul. On an open table, all illegally pocketed balls remain pocketed.

When the table is open it is legal to hit any solid or stripe or the 8-ball first in the process of pocketing the called stripe or solid. However, when the table is open and the 8-ball is the first ball contacted, no stripe or solid may be scored in favor of the shooter, but there is no foul, the shooter loses his turn only; any balls pocketed remain pocketed; and the incoming player addresses the balls with the table still open and accepts the cue ball in position.

While the table is "open", the player continues at the table until failing to legally pocket a numbered ball (except the 8-ball, it is a foul) or a scratch or foul is committed.

Choice of Group:

The choice of stripes or solids is not determined on the break even if balls are pocketed from one or both groups.

The choice of group is determined only after the break shot. A player must, at some time during the shot, touch the object ball and legally pocket this ball or another ball from the same group, that the first touched ball.

Legal shot:

On all shots (except on the break), the shooter must hit one of his group of balls (or any ball on an open table) first and (1) pocket a numbered ball, or (2) cause the cue ball or any numbered ball to contact a rail. Failure to meet these requirements is a foul. The cue ball may touch a rail before touching the object ball, but after this the conditions described above must be observed.

Any numbered ball pocketed on the same legal shot, unless it is the 8-ball, remain pocketed without resulting in a foul, regardless of whether they belong to the shooter or the opponent. However, potting any opponent's balls on the same legal shot is not a foul.

Foul Penalty:

A scratch or other foul results in a ball in hand anywhere on the table. Opposing player gets cue ball in hand and can place the cue ball anywhere on the table (except for when the foul is committed on the break, in which case the cue ball is placed behind the head string).

An object ball is considered to be illegally pocketed when that object ball is pocketed on the same shot a foul is committed. Illegally pocketed balls remain pocketed and are scored in favor of the shooter controlling that specific group of balls, solids or stripes.

Each of the following situations always constitutes a foul:

- When the cue ball is pocketed;
- Pockets the 8-ball when it is not the legal object ball (exception: 8-Ball pocketed on the Legal Break);
- Failing to cause the cue ball initial contact with an object ball.

Combination shots:

Combination shots are allowed provided that the player hits one of balls of his group first (except the Open Table rule applies).

The 8-ball cannot be used as a first ball in the combination shot, unless it is the shooter's last remaining legal object ball on the table. The 8-ball can be used in the middle of a combination but cannot be the first ball contacted, it is a foul (unless the table is open).

A combination shot can never be used to legally pocket the 8-ball, except when the 8-ball is the first ball contacted in the shot sequence.

Playing:

The player pocketing their group of object balls first in any order and then legally pocketing the 8-ball (black) wins the game. Fouls when pocketing the 8-ball is not a loss of game.

A player is entitled to continue shooting until he fails to legally pocket a ball from his group. After a player has pocketed all of balls of his group, he shoots the 8-ball to any pocket. The game is completed when the 8-ball (black) is legally potted in any pocket.

If the player pockets the 8-ball (black) before the player pockets all balls in own group, it is a foul; the 8-ball spotted at the foot spot and the incoming player has cue ball in hand.

Pockets the 8-ball on the same stroke, as the last of his group of balls, resulting in a foul without winning;

the 8-ball spotted.

Time Allowed:

A player has a limit of time to play each shot. If a shot is not played within defined time, the shooter loses his turn with resulting in a foul.

Special rule: Three consecutive times failure to play a shot within time limit is a loss of game.

- **Nine ball billiards:**

Requirements of the Game:

The billiards game shall be known as 9-Ball is a game played with a cue ball and nine object balls, numbered 1 through 9. In our game it is played on 9 foot Tournament billiard table, with play field size 4.5 X 9 foot = 50 inches by 100 inches; the balls used are 57,2 mm diameter.

Initially the numbered balls are racked with the 1-ball on the foot spot, the 9-ball in the center of the diamond, and the other balls in random order in a diamond formation. The game begins with cue ball in hand behind the head string.

Object of the Game:

On each shot, the first ball the cue ball contacts, must be the lowest numbered ball on the table, and the shooter must pocket any numbered ball, or cause the cue ball or any numbered ball to contact a rail. If a player pockets any ball on a legal shot, he remains at the table for another shot, and continues until he misses, fouls, or wins the game by pocketing the 9-ball.

After a miss, the incoming player must shoot from the position left by the previous player. After any foul, the incoming player may start with the cue ball in hand anywhere on the table.

At any time, a player legally pots the 9-ball wins the frame.

The Legal Break shot:

On the opening break the breaker must strike the 1-ball first and either pocket a numbered ball or drive at least four numbered balls to the rail. It is a Legal Break shot.

If the cue ball is pocketed, or the requirements of the opening break are not met, it is a foul, and the incoming player has cue ball in hand anywhere on the table.

If the breaker pockets one or more balls on the break shot without a fouls, he continues to shoot until he misses, fouls, or wins the game; pocketing the 9-ball on the Legal Break shot wins the game.

On the shot immediately following a Legal Break shot, the shooter may play a Push Out. If a player fouls on the break shot, the incoming player cannot play a Push Out.

The Push-Out shot:

On the first shot immediately after a Legal Break regardless of whether any balls were potted off the break, or who is at the table, a player have option to play a push-out shot. This means that for one shot only the player does not need to hit any object ball nor any rail, unless if the cue ball is pocketed, it is a foul.

Any ball pocketed on a push-out does not count and remains pocketed except the 9-ball, but the striker does not get to play another shot in that turn even if an object ball is pocketed.

Following a legal push-out, the incoming player accepts to shoot from that position, the game then continues as normal.

Playing:

When a player takes a shot, he must always hit the lowest numbered ball that is still on the table. Any numbered ball can be legally potted, so long as the lowest numbered ball is the first one the cue ball makes contact with.

Combination shots are allowed provided that the player hits the lowest numbered ball first. Moreover, the first contacted lowest numbered ball can be used in the middle of combination to legally pocket the 9-ball and wins the game!

If the player misses or fouls, the other player shoots until he misses, fouls, or wins.

Fouls:

If the first object ball contacted by the cue ball is not the lowest numbered ball on the table, the shot is a foul.

If no object ball is potted, failure to drive the cue ball or any numbered ball to a rail after the cue ball contacts the object ball is a foul.

If a shot is not played within defined time, it is a foul.

When a player commits a foul, any numbered object ball is potted on the same shot a foul is committed, unless it is the 9-ball, remain potted; the 9-ball is spotted at the foot spot; the incoming player is awarded ball in hand and may place the cue ball anywhere on the table.

Three consecutive fouls:

If a player fouls three consecutive times on three successive shots without making an intervening legal shot, he loses the game.

The End of Game:

The game ends when the 9-ball is potted on a legal shot, or when a player forfeits the game as the result of three consecutive fouls.

- **Snooker:**

Requirements of the Game:

The playing area in our Game within the cushion faces measure 10 x 5 ft (2950 x 1450 mm). The balls have a diameter of 52.5mm. The game played with white cue ball and twenty-one object balls — fifteen object balls that are not numbered and are solid red (called reds), and six object balls of other colors that are not numbered (called colors).

Object of the Game:

The objective is to score more points than the opponent by potting balls and, less commonly, by playing snookers that will force the opponent to make a foul stroke and thus give points away. This tactic employed at any time during a frame is to leave the cue ball behind a ball not on such that it is snookered for the next player.

If a player or side is more points behind than are available from the balls left on the table, then the laying of snookers in the hope of gaining points from fouls becomes most important.

General:

Each turn is called a "break" and consists of a series of strikes of the cue ball that come to an end when a

player makes a non-scoring strike or a foul stroke. The accumulation of points with a series of successful pocketed balls in snooker is called a break. The highest break you can achieve in a frame of snooker, that is managing to successfully pocket all 15 red balls alternatively with 15 black balls and all of the colored balls in order, is officially recognized as 147 and is known as a maximum break. If a player is awarded a free-ball there is a possible break of 155 on, though this is not recognized as the maximum break total.

The cue ball must be played from where it finished after the previous shot unless it was potted (when the striker has cue ball in hand within the half circle zone; he may place the base of the cue ball anywhere on the line or within the half circle zone).

Free Ball state :

If, following a foul shot, the cue ball is snookered, the next player may take a "free ball" — nominate any ball at the table as the "ball on". In other words, when a player leaves an opponent unable to hit *both sides* of at least one ball "on" after a foul, the other player will receive a free ball. This means, when the player receive the "free ball" state, he has the option to *play any ball on the table* as if it was the ball that should properly be played next (called "ball on"). For example, if a "free ball" occurs on a red, the player may play any color as if it were a red.

The first touched ball, other than the "ball on", is called as the "free ball" and can be potted.

If the "free ball" (this means any ball, other than the "ball on") was hit first by the cue ball, both the "free ball" and the "ball on" can be potted simultaneously without a foul. If the color ball as the "free ball" is potted, it is spotted; red balls are never spotted.

After the shot in the "free ball" state, if the cue ball snookered by the "free ball", it is a foul, except when only the pink and black remain on the table.

Playing :

For the first stroke of each turn, until all reds are off the table, red or a "free ball", nominated as a red, is the "ball on".

In all cases, the next ball to be potted, must be the first ball struck by the cue ball or a foul shot is declared. So when a player has next to pot a red ball, if a ball other than a red ball (except the "free ball" state) is struck first, it is a foul stroke.

When the next legal object is a color ball, only the ball that was hit first by the cue ball is can be potted, otherwise it is a foul (exclude the "free ball" state, then the "free ball" was hit first and the "ball on" was potted).

When the next legal object is a red ball or the "free ball" nominated as red, any red ball (not only the first touched red ball or "free ball") or several red balls can be pocketed on the same shot.

If a red, or a "free ball" nominated as a red, is legally potted, the same player plays the next stroke and the next ball on is any color ball. If red balls remains on the table, or the last red ball pocketed on the previous legal shot, the next legal object is any color ball of the striker's choice which, if legally potted, is scored and the color ball is then spotted. When no reds remain on the table, striker's balls on become the colors, in ascending numerical order (2,3,4,5,6,7).

If the striker fails to score or commits a foul, his turn ends and the next player plays from where the cue-ball comes to rest, or from in-hand within the half circle if the cue-ball was potted.

Scoring:

Points are scored in two ways: by legally potting reds or colors, and players are awarded points for fouls by the opponent.

Each legally potted red ball has a point value of one; each legally potted color ball has a point value as: Yellow valued 2, Green 3, Brown 4, Blue 5, Pink 6 and Black 7.

Points awarded for scoring strokes are added to the score of the striker. Penalty points from fouls are added to the opponent's score.

If the "ball on" is potted it is scored.

If the ball as the "free ball" is potted, the value of the "ball on" is scored. This means, if the color ball nominated as a "free red" is potted, the value of red ball (one point) is scored.

If both the "free ball" and the "ball on" are potted, only the value of the "ball on" is scored.

Hitting two balls Simultaneously:

Two balls, other than two reds or a "free ball" and a "ball on", must not be struck simultaneously by the first impact of the cue ball; it is a foul.

Spotting Balls:

Reds are never spotted. Reds illegally potted are not spotted; they remain off the table. Colors illegally potted are spotted.

When no reds remain on the table, legally potted colors are not spotted after each is potted; they remain off the table; illegally potted are spotted.

Fouls:

If a shot is not played within defined time, it is a foul.

Causing the cue ball to miss all object balls, or the cue ball to enter a pocket, is a foul.

Failure to contact a legal object ball first (a ball not on) is a foul.

Causing the cue ball to first hit simultaneously two balls, other than two reds or a "free ball" and a "ball on", is a foul.

If the striker's ball on is a red, and he pots a color, it is a foul; any red ball pocketed on the same legal shot is not a foul (except the "free ball" state).

If the striker's ball on is a color, and he pots any other ball (red or color), it is a foul (except the "free ball" state).

If the striker fails to score or commits a foul, his turn ends and the next player plays from where the cue-ball comes to rest, or from in-hand within the "D zone" if the cue-ball was potted.

End of Frame:

Eventually all balls except the black have been potted.

When only the Black is left, the first score or foul ends the frame excepting only if the scores are then equal.

When the scores are equal and the Black is potted, the Black is spotted, and the next score or foul ends the frame.

Special rule: Three consecutive times failure to play a shot within time limit is a loss of game.

Sample Script

Legends:

Abbreviation	Full Form
AI	Animated Image
BI	Background Image
B	Button
TB	Text box
BM	Background Music
A	Animation
I	Image
VO	Voice Over
T	Text
AT	Animated Text

SCREEN 1

A 1.1: A flash animation of hitting billiard balls with the cue stick on a billiard table.

AT 1.1: Computer Based Training. {Each letter of this text is coming one after another to form this text.}

AT 1.2: On {each letter of this text is appeared just after previous.}

AT 1.3: How to play billiards {each letter of this text is appeared just after previous.}

AT 1.4: Developed {each letter of this text is appeared just after previous.}

AT 1.5: By {each letter of this text is appeared just after previous.}

AT 1.6: Nilim Sarkar {each letter of this text is appeared just after previous.}

AT 1.7: M.Tech-IT(CWE) {each letter of this text is appeared just after previous.}

BM 1.1: Sound of hitting balls on billiard table.

BI 1.1: An image of a billiard table

BM 1.2: A background music playing at the starting of the screen.

B 1.1: Main menu(navigation to scene 5)

B 1.2: Next button(navigation to scene 2)

B 1.3: Stop sound

B 1.4: Play sound

B 1.5: Stop button

B 1.6: Close button

SCREEN 2

BI 2.1: An image of a billiard table

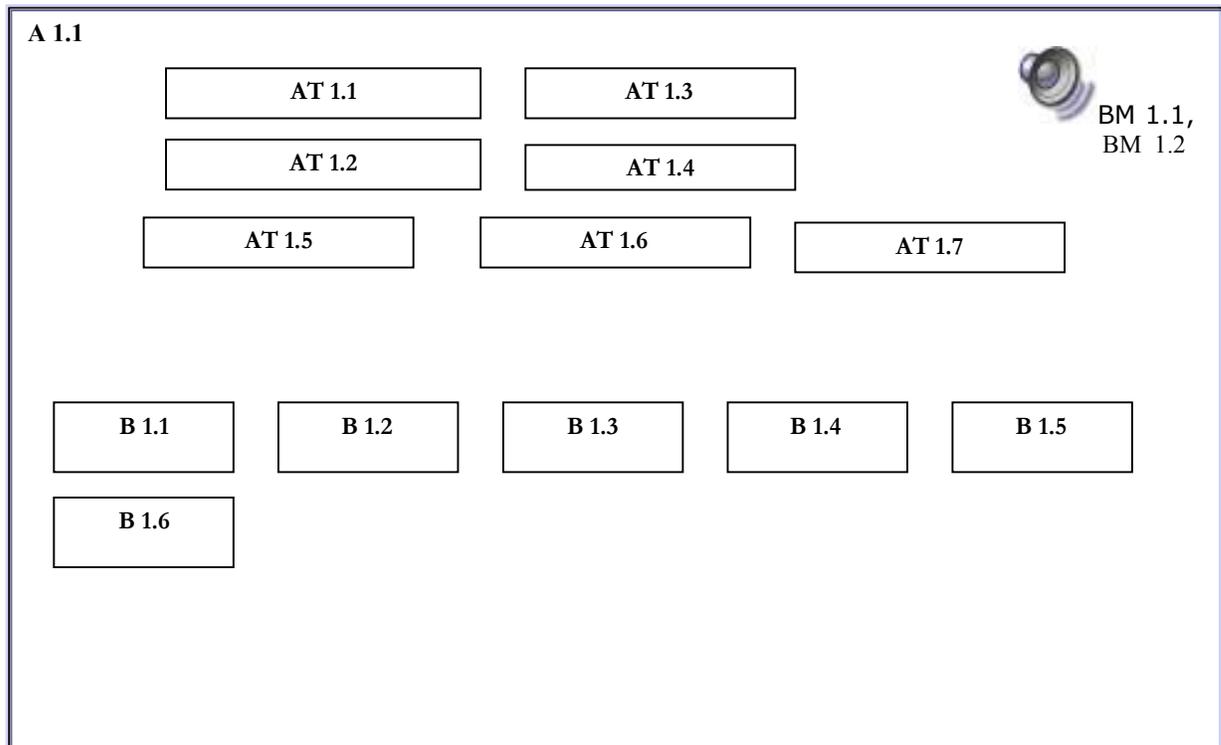
AT 2.1: Objectives {This text is appeared at the top of the screen with fade out effects }

T 2.1: After going through the CBT the user will be able:

- T 2.2 To explain the equipments of the game.
- T 2.3: To know the rules of the game.
- T 2.4 : To detect what is foul and what is a legal shot.
- T 2.5: To play the game even in absence of the instructor.
- B 2.1: Main menu(navigation to scene 5)
- B 2.2:Next button(navigation to scene 3)
- B 2.3: Stop sound
- B 2.4 : Play sound
- B 2.5: Stop button
- B 2.6: Close button
- B 2.7 : Previous button(navigation to scene 1)
- B 2.8 : Home button(navigation to scene 1)

Sample Story Board:

SCREEN 1



V. TESTING STRATEGY

After completion of the job, the presentation was thoroughly checked screen by screen i.e. each screen of that CBT was checked individually to see the appropriate animation for proper content, voice over and also Spell checks were carried out. So the Unit Testing was done. Checking for proper voice over and spelling, grammatical rules rectifying the errors if any, modifying and making the changes as per the given instruction of the experts were carried out there after.

After Unit testing was done, the whole CBT was thoroughly checked with the navigational links to each individual pages i.e. Integration Testing was done. The animation strip was shown to some experts for their views and the suggestions and corrections were incorporated. After this the final checking and rendering was done, this rendered presentation has been checked on different machine and with different configurations i.e. System Testing was done.

VI. IMPLEMENTATION DETAILS

Macromedia Flash 5.0 is used as a base tool to prepare the CBT. Macromedia Flash 5.0, has used mainly to develop a lot of animation used in this CBT. The background of the screens were prepared in Adobe Photoshop 6.0 as well as in Macromedia Flash 5.0 and they were put into the corresponding pages. After this, text components were put to their relevant places in every screen. The whole CBT was divided into 5 sections. Each section contains several subtopics. A section was taken up for implementation only after the completion of its previous section. Along with the text components, movies, graphics, animations were also incorporated as and when required. After all the sections have been completed the present worker incorporated the navigation or the interaction part. The navigational buttons have been developed Macromedia Flash 5.0. In the next stage navigations between different screens were made. One can go to each of the topic from the main menu. The main menu and also submenus of different chapters have been maintained. All these interactive sessions have been prepared using action script of Flash 5.0 and Microsoft Visual Basic 6.0. Voice over was attached to the project at the last stage of implementation. Voice over was recorded in Sound Forge XP 4.0 and saved as .wav format.

VII. FURTHER SCOPE OF DEVELOPMENT

It has already been mentioned under the heading “Design Methodology” that scope of how to play billiards game consists of vast span of skills, rules and concepts of the game for its different types. This CBT tries to provide an introductory tutorial with glimpses of few concepts, rules and various tips under different conditions related to some specific types of billiards. Hence, it is quite obvious that future CBTs on billiards has enormous scope to include other uncovered areas like, carom billiards, one pocket billiard, bank pool etc.

VIII. CONCLUSION

In conclusion it can be said that, this CBT has only laid down the foundation stone. A true comprehensive training course on “How To Play Billiards” will require a number of CBT of this sort. By and large, given the scope of the present CBT, most of its objectives have been fulfilled, though a thorough testing, review and then modification can make the CBT more effective. As explained above, addition of new topics and incorporation of new interactivities can also enhance its value to a great extent. Development of the CBT required various technologies like, Adobe Photoshop 6.0, Macromedia Director 8.5, Macromedia Flash 5.0, Visual Basic 6.0, Microsoft Office 2000, Sound Forge XP 4.0, which also improved the developer’s knowledge and understanding about these tools.

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