**General Requirements**

*Establish the theme and intent.*

Whatever architecture and implementation technology is used to support the requirements for a [poker](http://ie.surfcanyon.com/search?f=sl&q=poker&partner=wtiienusj) game, it is best to be flexible, not only in terms of poker and cards, but also perhaps in terms of games in general. Thus the poker game may be adaptable, possibly becoming a bridge game or some other type of game that shares only the concept of gaming with the original concept of a poker game. Certainly this last requirement should not be taken too seriously in developing a totally adaptable, extensible, solve-it-all design, but with this principle in mind, one may have a better background into the possible scenarios for future development and extension of the platform.

**Elements**

*Establish the ontology of objects in* [*poker*](http://ie.surfcanyon.com/search?f=sl&q=poker&partner=wtiienusj)*.*

* [Playing car ds](http://infolab.stanford.edu/~burback/water_sluice/sluice6.25.97/ws/node79.html" \l "SECTION000102100000000000000)

* [Players](http://infolab.stanford.edu/~burback/water_sluice/sluice6.25.97/ws/node80.html" \l "SECTION000102200000000000000)

* [Poker Chips](http://infolab.stanford.edu/~burback/water_sluice/sluice6.25.97/ws/node81.html" \l "SECTION000102300000000000000)

* [Table](http://infolab.stanford.edu/~burback/water_sluice/sluice6.25.97/ws/node82.html" \l "SECTION000102400000000000000)

* [Additional considerations](http://infolab.stanford.edu/~burback/water_sluice/sluice6.25.97/ws/node83.html" \l "SECTION000102500000000000000)

### Playing cards

52 cards

Broken into 4 suits - Clubs, Diamonds, Spades, and Hearts. Each suit contains 13 cards, [which](http://ie.surfcanyon.com/search?f=sl&q=which&partner=wtiienusj) rank: Ace (high), King, Queen, Jack, 10, 9, 8, 7, 6, 5, 4, 3, 2. The ace also ranks low in sequence: 5-4-3-2-A.

Joker

The normal deck may be supplemented with one or more jokers which can be used to stand for any card. A Bug is a special form of a joker that can only be used in some instances, such as in a flush, straight (see later description) or for an ace.

### Players

Two to ten can play. Five to eight is best. Each player plays for himself.

### Poker Chips

There are at least three different kinds [poker](http://ie.surfcanyon.com/search?f=sl&q=poker&partner=wtiienusj) chips, each with a different color, with plenty of chips for high-stakes games. The usual arrangement for chips is red, blue, and white chips, where 10 whites = 2 reds = 1 blue chip.

### Table

Card tables are usually green felt-covered adorned with wood and gaming decorations. The table should accommodate all players comfortably while minimizing the possibility of cheating. This is accomplished by making the table round giving equal distance to the center of the table. When more than 4 players are involved, an octagonal or circular table is provided.

### Additional considerations

A spare deck of cards is usually recommended for unforeseen accidents and general card deterioration.

**Action**

*Continue establishing the ontology by defining the actions that can be accomplished.*

* [Set Up](http://infolab.stanford.edu/~burback/water_sluice/sluice6.25.97/ws/node85.html" \l "SECTION000103100000000000000)

* [Ante](http://infolab.stanford.edu/~burback/water_sluice/sluice6.25.97/ws/node86.html" \l "SECTION000103200000000000000)

* [The Deal](http://infolab.stanford.edu/~burback/water_sluice/sluice6.25.97/ws/node87.html" \l "SECTION000103300000000000000)

* [The Play](http://infolab.stanford.edu/~burback/water_sluice/sluice6.25.97/ws/node88.html" \l "SECTION000103400000000000000)

* [Five Card Draw Details](http://infolab.stanford.edu/~burback/water_sluice/sluice6.25.97/ws/node89.html" \l "SECTION000103500000000000000)

* [The Rank of Poker Hands](http://infolab.stanford.edu/~burback/water_sluice/sluice6.25.97/ws/node90.html" \l "SECTION000103600000000000000)

* [Alternative Rank of Poker Hands](http://infolab.stanford.edu/~burback/water_sluice/sluice6.25.97/ws/node91.html" \l "SECTION000103700000000000000)

* [The Rules of Betting](http://infolab.stanford.edu/~burback/water_sluice/sluice6.25.97/ws/node92.html" \l "SECTION000103800000000000000)

### Set Up

Banker

One player is chosen to be the banker from the start of the game. The banker is responsible for exchanging monetary items for [poker](http://ie.surfcanyon.com/search?f=sl&q=poker&partner=wtiienusj) chips. This is done at the start of the game, at various times throughout the game, as well as the ''cash out'' at the end of the game.

Seating

The banker is given first choice of seats. Usually not an issue, the banker may deal cards to determine who will sit where. Re-seating may occur in this same fashion at most once per hour.

Dealer

The dealer is chosen by dealing cards, face up, one at a time to each player. The first player to receive a Jack is the first dealer. From then on, the deal usually passes around the table in a clockwise fashion, at the conclusion of each hand.

### Ante

A fixed nominal amount, usually one white chip, is put into the center by each player to get the pot started.

### The Play

[Poker](http://ie.surfcanyon.com/search?f=sl&q=Poker&partner=wtiienusj) is a game of betting. He who holds the best hand at the end of the hand wins the pot, or the sum of all chips bet during the hand. This pot, represented in the center of the table, can be won in one of two ways. First, after all players have had ample opportunity to bet, there is a showdown where the best hand of the remaining players wins the pot. Second, if a player makes a bet that no other player is willing to meet, that player wins the pot with no obligation to show his hand. This is where the concept of bluffing is introduced in poker, to bet on a weak hand in hopes of intimidating the other players out of the hand.

### The Deal

Cards are dealt one at a time in a clockwise direction from the player on the dealer's left. In five card draw, each player receives five cards, face down. The dealer holds the remaining cards. The first betting interval then commences.

### Five Card Draw Details

In five card draw, after each player receives his five cards, there is a betting interval, followed by a period where each player may turn in between one and three cards to the dealer for the same number of new cards. This is done in the same clockwise fashion in [which](http://ie.surfcanyon.com/search?f=sl&q=which&partner=wtiienusj) the hands were dealt. Another betting interval follows, concluded by a showdown for determination of the winner. The winner is determined by having each player turn over their cards and optionally announcing what his hand is. The pot then goes to the best hand, a new dealer is selected, a new ante put forth, and the next hand begins.

### The Rank of Poker Hands

The following lists the order (or ranking) of valid [poker](http://ie.surfcanyon.com/search?f=sl&q=poker&partner=wtiienusj) hands from highest to lowest in value. These hands are valid for all types of poker including five card draw.

**Five of a kind**

highest hand possible with joker.

**Straight flush**

five cards in sequence in the same suit. A royal straight flush (A-K-Q-J-10 in same suit) is the highest non-joker poker hand possible.

**Four of a kind**

four cards of the same rank.

**Full house**

three of a kind and a pair. When matching full houses, the one with the higher three of a kind wins.

**Flush**

any five cards five cards of the same suit.

**Straight**

in sequence but not all of the same suit.

**Three of a kind**

three of the same rank with two unmatched cards.

**Two pairs**

two cards of one rank with two cards of a different rank with one dissimilar card. When matching pairs occurs between players, the one with the higher fifth card wins.

**One pair**

any two cards of the same rank.

**High card**

highest card in hand.

**Hand**

A subset of the cards. Potions of the hand may have global visibility while other portions may be concealed.

### Alternative Rank of Poker Hands

The standard ranks are listed in the previous section. Occasionally the relative rank of two hands is modified.

**Tie**

when two players have the same type of [poker](http://ie.surfcanyon.com/search?f=sl&q=poker&partner=wtiienusj) hand (as listed above), the one with the higher ranking cards wins. Thus if the highest card in each hand is also a tie, the next card is used, and so on. If two hands are exactly the same in all respects (except suits), the players tie.

**Hi-Low**

In this variation, both the highest and lowest hand split the pot. Any odd chips are awarded to the higher hand.

**Wild**

In addition to the jokers previously mentioned, the dealer may declare a rank or group of cards (usually deuces) wild. These wild cards may stand for any card, except for a card already in the players hand.

### The Rules of Betting

**General**

Betting is done during betting intervals. In five card draw, their is one betting interval after all five cards have been dealt to each player, and another after the dealer has exchanged any cards. The betting round then commences with the one player with the right (or duty) to make the first bet. This is usually the player to the left of the dealer. The player then puts his bet into the center of the table while announcing the bet. Betting then proceeds clockwise around the table with each player doing one of the following:

**Drop**

The player forfeits the hand, and any chips previously put into the pot. The chips will eventually go to the winner of the pot. This is called ``passing''.

**Call**

The player puts in exactly enough chips to ``match'' the current bet in the pot - such that he has put in the same as the greatest number of chips put into the pot by another player. This is called ``staying in''

**Raise**

The player, in addition to putting in enough chips to call or ``stay in'', increases his contribution by an amount [which](http://ie.surfcanyon.com/search?f=sl&q=which&partner=wtiienusj) he announces as his raise. Every other player must then match this raise to stay in.

**Equalization**

The betting continues, as described above, until all bets have equalized, or rather until every player has put the same amount of chips into the pot (or passed). The betting interval is then said to be concluded.

**Check**

If the first better chooses not to make an additional pot contribution then this is called a check. Each player may also check, having the effect of not raising the value of the pot during the current betting interval.

**Limits**

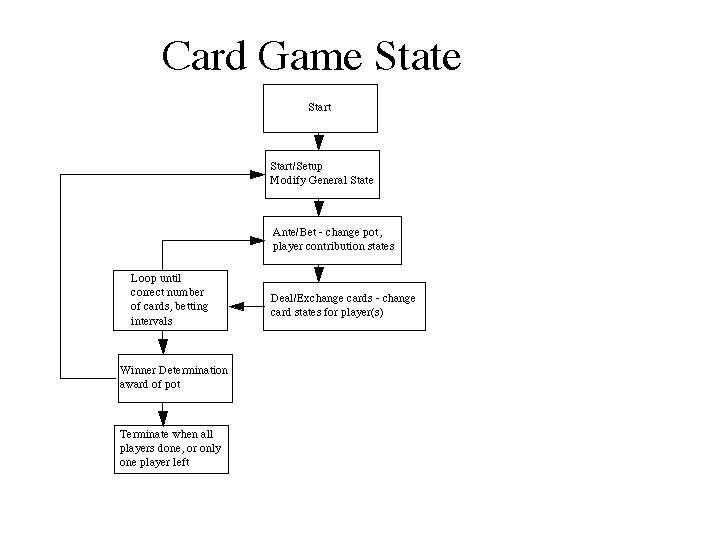
Most [poker](http://ie.surfcanyon.com/search?f=sl&q=poker&partner=wtiienusj) games are played with a limit on the number of chips bet at once. This limit is usually between five and ten chips.

**Table Stakes**

One may play with different bet limits for each player. How this occurs is that the maximum bet limit for a given player is how many chips they have on the table. When betting, a main pot is used to contain those chips which are equally representative of all remaining players in the game. Players may bet above and beyond this limit in side pots against other players in the game. The winner then takes the main pot, and any additional side pots which the winner was represented in.

## State

*Define the states of the game.*

A general state diagram for the design of a [poker](http://ie.surfcanyon.com/search?f=sl&q=poker&partner=wtiienusj) machine may be seen in Figure   
**Figure:** Card Machine State Diagram

### General State (usually modified between hands)

* Game variation - only altered between hands
* Chips - exchanging chips for money, vice versa
* Players - leaving/entering game, replacing each other
* Cards - new deck, addition/subtraction of Jokers

### Hand Specific State (modified by appropriate state)

* Number of cards in each players hand
* Amount of pot
* Amount contributed by each player to main (and possibly secondary pots)
* Number of betting intervals accomplished

**Typical Scenarios**

*A typical scenario defines the normal play of the game and guides the design team in architectural alternatives. The typical scenarios also become the template for system level testing.*

* [Betting](http://infolab.stanford.edu/~burback/water_sluice/sluice6.25.97/ws/node97.html" \l "SECTION000105100000000000000)

* [Winner Determination](http://infolab.stanford.edu/~burback/water_sluice/sluice6.25.97/ws/node98.html" \l "SECTION000105200000000000000)

### Betting

During the betting interval, player A bets one blue chip. Player B, wanting to stay in, calls (puts in one blue chip). Player C raises one blue chip and one red chip (puts in two blue chips and one red chip into the pot). Player D raises one red chip (puts in three blue chips). Player A raises one red chip more (puts in two blue chips and one red chip total - two blue chips to call, and one red chip more to raise). Player B drops out, and players C and D call. The total value added to the pot during this betting interval is then eleven blue chips and one red chip (three blue chips and one red chip for each of the three players still in, plus the blue chip forfeited by player B).

### Winner Determination

Player A from the previous betting example lays down his hand and shows a full house consisting of three 5's and a pair of ten's. Player C shows his hand [which](http://ie.surfcanyon.com/search?f=sl&q=which&partner=wtiienusj) contains a flush - five cards, all hearts. So far, player C is the high player. Player D then shows his hand which contains four jacks. Player D is the winner. If this was a high-low game, players D and A would split the pot (the high and low hands respectively).

**Atypical Scenarios**

*The atypical scenario defines a seldom action. The game must handle this case correctly but perhaps at a lower performance.*

* [Table stakes](http://infolab.stanford.edu/~burback/water_sluice/sluice6.25.97/ws/node100.html" \l "SECTION000106100000000000000)

* [Winner Determination](http://infolab.stanford.edu/~burback/water_sluice/sluice6.25.97/ws/node101.html" \l "SECTION000106200000000000000)

### Table stakes

Players A, B, C and D each are competing for the pot. Player A has 160 in chips. Player B has 120. And both Players C and D have 50. C and D can call any bet made by either A or B for 50. A can call any bet made by C or D, and 120 of any bet made by A. Thus, player A has 40 that cannot be bet in this round. Suppose that B bets 80 in chips. Player C drops. Player D calls for 50, that being the most that he can. Player A calls the entire bet, putting in 80. 50 goes into the main pot, and 30 goes into a side pot with B. The winner of the hand (either A, B or D) will get the primary pot. In addition, if A's hand is better than B's, then A will get the 60 in the side pot. If B's hand is better, B will get the 60.

### Winner Determination

Players A, B, C, and D have all stayed in the hand until the end of the betting. Player A shows an A-Q-9-8-8-6 hand. Player B lays down a A-10-10-9-8-6 hand. So far, B is winning because his pair of tens beats A's pair of eights. Player C then lays down a A-10-10-9-8-7. Now, player C is on top since his cards match all of player B's except for the last card - [which](http://ie.surfcanyon.com/search?f=sl&q=which&partner=wtiienusj) is higher for him (a seven versus a six). Player D has 6-6-4-3-2, and is not in the running. If player B would have had a 7 instead of a 6, then player's A and C would have tied, and they would have split the pot.

*The requirement document is now complete. Notice how it does not define the architecture nor dictate the implementation. The goal of the requirement document is to define the problem and not the solutions. The requirement document should now become the foundation on which all other decisions are based. It should guide the architecture and the implementation plan.*