I read a paper describing how deep blue, the chess machine that beat world chess champion Garry Kasparov, works.  This system was made up of heavily customized hardware and a fine tuned program combined with a large database of grandmaster games.

The system had a 30 node processor IBM RS/6000 SP computer combined with 480 single chip chess search engines, with 16 chess chips per processor.  The chess chips in Deep Blue were each capable of searching 2 to 2.5 million chess positions per second.  Each node had 1 GB of RAM and 4GB of disk while running some obscure operating system called AIX.  One of the 30 processors was the master and the others were the workers.  The master searched the top levels of the game tree then distributed the leaf positions to the workers.  Each worker carried out a few levels of additional search, then distributed their leaf positions to the 16 chess chips underneath them, and those chess chips searched the last few levels of the tree.

The advantages of implementing the evaluation function in hardware made the evaluation function run more quickly, the downside was that modifying it was much harder.  New features could not be added and software patches were hard to do.  One limitation on the hardware portion of the search(the higher depths of the search) was the lack of a transposition table, which was only available to the upper software levels of the search.

There was also a "repetition detector" which using a content-addressable memory algorithm, tracked the number of pieces displaced in each of the last 32 positions with respect to the current board position.  When the number of pieces displaced equaled zero, it was a repeated position.  One displaced position meant there as a legal move that would lead to a repetition.  Repetitions can represent "no progress" or be of concern to avoid or pursue three fold repetition which would allow for a draw to be claimed.

Deep blue used quiescence search, iterative deepening, transposition tables and the NegaScout algorithm.  The evaluation function had 8000 features and was composed of a fast evaluation and a slow evaluation.  The fast evaluation computed a score for a chess position with all easily computed major evaluation terms with high values and was primarily focused on the relative value of each piece on the board.  The slow evaluation focused on chess concepts like square control,pins, x-rays, king safety, etc.  The features in both evaluation functions had programmable adjustable weights.  The opening book was created by hand by grandmasters.  The endgame databases allowed deep blue to play all positions with 5 or fewer positions on the board perfectly.   One thing that was lacking was that no pruning was taking place.  A 3 minute search on Deep Blue would reach a full-width depth of 12.2 on average in a game with a time control of 40 moves in 2 hours.