In the early 1970s, planners used an approach called linear planning, which decomposed a problem into several subgoals and then stringing the subplans together to solve the overall problem. Its advantages include reduced search space, highly efficient if goals are independent, and all solutions found are legal. However, it does not produce the optimal solution and may not find the solution. (Reid Simmons, *Planning, Execution & Learning, https://www.cs.cmu.edu/~reids/planning/handouts/Linear.pdf*). Sussman anomaly is one example of the limitation of linear planning. By using linear planning, planners are forcing an order on operators when they do not need to be mutually ordered. The problem has a solution but it cannot be solved by solving each subgoal in a sequence. (http://www.it.uu.se/edu/course/homepage/aism/st11/Sussman.pdf) Then came partial order planning.

Non-linear planning involves using goal set and include in the search space all possible subgoal orderings. Its main advantages are being sound and complete while the disadvantage being larger search space and more complex representation. (Reid Simmons, *Planning, Execution & Learning, https://www.cs.cmu.edu/~reids/planning/handouts/Linear.pdf*) Examples of non-linear planning includes STRIPS planner, ABSTRIPS, ALPINE and many other variations.

Recently, planners are interested in representing plans as binary decision diagrams, for instance combining BDD with fluent calculus in planning. Hans-Peter Störr attempted to utilize the BDD reasoning engine in planning. He recognized the exponential explosion of propositional variables and implemented a symbolic breadth-first-search to find the shortest solution, compromising some of the advantages of BDD. (Hans-Peter Störr, *Planning in the Fluent Calculus Using Binary Decision Diagrams*) Peter Kissmann and Jorg Hoffmann pointed out, in another paper, that by adding dynamic reordering, they can effectively educe BDD size, but not as cost-effective due to a prohibitive runtime overhead. They suggested that by using dynamic reordering until simple stopping criteria hold can be a middle ground that effectively utilize BDD in planning. (Peter Kissmann and Jorg Hoffmann, *BDD Ordering Heuristics for Classical Planning*)