Main limitation of the majority of algorithms is that different parameters are required for proper functioning of these algorithms. Appropriate selection of the parameters is indispensable for searching of the optimum solution by these algorithms. A change in the algorithm parameters changes the effectiveness of the algorithm. Therefore, there was motivation to develop an optimization technique which is free from the algorithm parameters.

The undertaken research work focuses on the development of a new algorithm for the Job shop scheduling problem for Makespan optimization. A new algorithm called Maze puzzle algorithm (MPA) has been developed in this Research Work for solving the job shop problem. Innovative algorithm based on Rotation and Random Jumping has been developed for makespan minimization. Coding is prepared using MATLAB software, swapping approach is hybridized and implemented to improve the results. Benchmark problem is evaluated for assessing the efficiency of the algorithm. One Industrial Case problem with 12 Jobs 5 machine has been solved using MPA and optimum result is obtained. Benchmark problems are solved to check optimal results using Proposed Maze puzzle Algorithm. In most of the cases Results are found optimum or near to optimum for given benchmark problems. The results are also comparable with other algorithms.

This PhD thesis would be useful for researchers & Industrialist.

Publications:

3. Published paper in International conference proceeding on A state of the art Review on Dispatching Rules for Job shop scheduling.
8. Paper Accepted in International Journal of Operation Research (Inderscience Publication) on “Development of Maze Puzzle Algorithm for the Job Shop Scheduling”.

Abstract