

ABSTRACT

The manufacturing industry is an industry that carries out the process of converting raw materials into ready-to-use materials. The process carried out by manufacturing consists of several stages. To move each finished product at each stage in several companies, they still use conveyors or heavy machines installed and still need to rely on human power. This makes the performance of the manufacturing industry less efficient because the conveyor or machine is fixed and cannot be moved, and it is less flexible while still relying on tired human labour. By utilizing a flexible manufacturing system, the efficiency and flexibility of the production process can be increased.

In the current manufacturing area, we are carrying out work aimed at increasing work time efficiency by utilizing autonomous mobile robots in industry. In the last few decades, several areas that utilize mobile robots are still moving by controlling the paths that have been made. To help coordinate the motion of the mobile robot to get to the destination location, several methods are used in this work. Forward kinematic mecanum, SLAM and Dijkstra methods are used to test the movement of the mobile robot to be able to move to the destination coordinates and to determine the position of the mobile robot in an area that has not been known before. In addition, the method used can ensure that the mobile robot avoids collisions with obstacles in its environment.

From the test results obtained some validation data which produce an accuracy value of the average system. We present the test results showing that each mobile robot will regulate the movement of the autonomous mobile robot in reaching the destination position with an accuracy of 82.86%, and is able to transport 1-5 kg of goods to the destination position in 85s - 120s

Keywords: *flexible manufacturing system, Autonomous Mobile Robot, SLAM dan Dijkstra*