This “Conceptual Design Report” is prepared by X-Cali to advise the clients about the “Maze Solver Robot” of X-Cali will be published at the end of the 2018, May at its last version.

The chosen design is a maze solver robot with a plank top of it. It has following specifications; Sensing walls, turning right or left (turn right is prior) when wall is detected, determining other robots position and acting accordingly (for U-Turns, since they cannot make it at once).

The main and alternative solutions for the design and fabrication process of the project are included in this report. Movement, sensors, decision and control parts of the main solution are explained in detail. For the movement issue, a rear-wheel driving robot is designed. The reason for this choice is that rear wheel driving provides more maneuverability. DC motor is preferred for the robot because it provides two options for speed control which are PWM and Voltage Control. Secondly, Ultrasonic Proximity Sensor, IR Proximity Sensor and Camera are considered and evaluated in terms of advantages and drawbacks for Sensor part. All of them will be used in the project but the main sensor that will determine the next move will be Camera. The engineers of the company X-Cali came up with two possible solutions for the Decision and Control mechanism. In the first one image processing is required to be performed. One of the robots will sense the other robots movement by calculating the angle of the plank. The alternative solution consists of Hall effect sensor and 3-axis gyroscope. The rotation angle is calculated from changing magnetic field.

Up until now in the report, profile of the employees, the works have been done since the very beginning of the project along with all technical information, organizational structure of the company, the goal of the project, a main and an alternative solution (in case of emerging problems in the main solution) to achieve the aim is explained in detailed. Furthermore, “Gantt Chart” and cost analysis, test plans and procedures are indicated in the relevant parts of the report.

To sum up, all the necessary information about our product is been supplied throughout the report and the information demonstrates that our product is much more than merely meeting the requisitions of customers. Therefore, it is seemed that the X-Cali Company will be a brand new and rapidly rising brand in this market at the end of this project.