Implementation of Vending Machine Using Mixed Signal

MANSI SHUKLA, International Institute of Information Technology, NAYA RAIPUR

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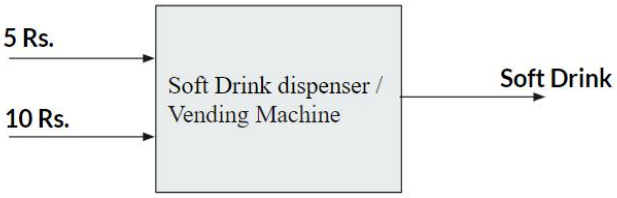
***Abstract*—A vending machine is an automatic machine that sells food like canned soups and packed sandwiches, snacks like potato chips and candies, cold drinks, and other products like newspapers and tickets. When a product is chosen and money (typically coins or paper money) is inserted into a slot, the machine normally operates. If there is enough money, the chosen item will be deposited into a tray, where the individual making the purchase can take it out.**

I. Introduction

When a coin is entered into a vending machine, it is utilized to dispense small amounts of various products. Using a micro-controller and an FPGA board, these machines can be created in a variety of ways. In this research, we present an efficient technique for vending machine implementation using an FPGA board. Because vending machines with FPGAs provide quick service. The vending machine based on a micro-controller has a faster response time and consumes less electricity. The vending machine is powered by an FPGA. There are one goods and two coins in this set. The vending machine receives pennies in any order as inputs and provides items as needed. If the entered amount is larger than the price of the product, the required amount is deposited and the change is returned.

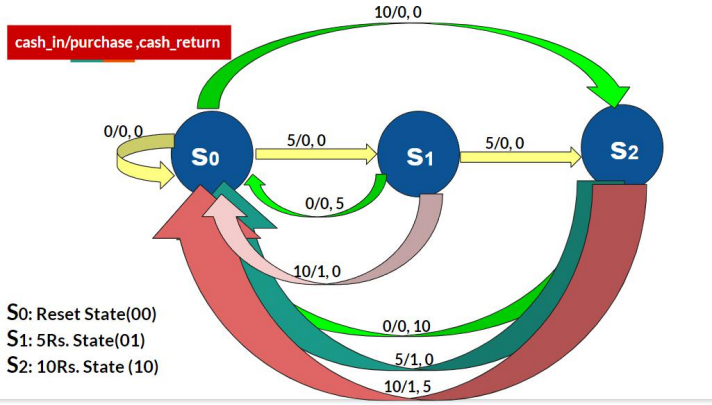
We have design a vending machine with following specifications which also return a change:

- A product of price 15Rs.
- Acceptable coins: 5Rs. and 10Rs.



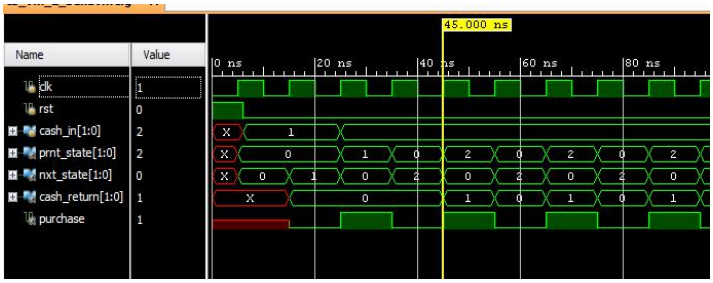
Fig(a): Block Diagram representation of implemented Circuit

Vending Machine State Diagram (with return):



Fig(b): State Diagram representation of vending machine

Reference Waveform:



Fig(c): Reference Waveform

References:

[1] Abishek Luthra, "Design and Implementation of Vending Machine using Verilog HDL on FPGA," International Journal of Innovative Research in Science, Engineering and Technology, Vol.4, Issue-11, November, 2015.

[2] Ana Monga, Balwinder Singh, Academic and Consultancy-Services Division, Centre for Development of Advanced Computing (C-DAC), Mohali, India, "Finite State Machine based Vending Machine Controller with Auto-Billing Features," International Journal of VLSI design and Communication Systems (VLSICS), Vol.3, No.2, April 2012.