



Karunya INSTITUTE OF TECHNOLOGY AND SCIENCES

(Declared as Deemed to be University under Sec.3 of the UGC Act, 1956)

MoE, UGC & AICTE Approved

NAAC A++ Accredited

An internship report submitted by

THEJASWINI KISHORE - URK21CS1067

SUMITHA R – URK21CS1038

in partial fulfillment for the award of the degree of

BACHELOR OF TECHNOLOGY

in

COMPUTER SCIENCE AND ENGINEERING

under the supervision of

Dr. K. VIDHYA Assistant Professor



DIVISION OF COMPUTER SCIENCE AND ENGINEERING

KARUNYA INSTITUTE OF TECHNOLOGY AND SCIENCES

(Declared as Deemed to be University under Sec-3 of the UGC Act, 1956)

Karunya Nagar, Coimbatore - 641 114. INDIA



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BONAFIDE CERTIFICATE

This is to certify that the report entitled, “DESIGN AND IMPLEMENTATION OF ATP MACHINE CONTROLLER” is a bonafide record of Internship work done at INTEL during the academic year 2022-2023 by

(Reg. No: URK21CS1067, URK21CS1038)

in partial fulfillment of the requirements for the award of the degree of Bachelor of Technology in Computer Science and Engineering of Karunya Institute of Technology and Sciences.

Guide Signature

Dr.Vidhya K

Assistant Professor

ACKNOWLEDGEMENT

First and foremost, I praise and thank ALMIGHTY GOD whose blessings have bestowed in me the will power and confidence to carry out my internship.

I am grateful to our beloved founders **Late. Dr. D.G.S. Dhinakaran, C.A.I.I.B, Ph.D** and **Dr. Paul Dhinakaran, M.B.A, Ph.D**, for their love and always remembering us in their prayers.

We extend Our tanks to **Dr. Prince Arulraj, M.E., Ph.D., Ph.D.**, our honorable vice chancellor, **Dr. E. J. James, Ph.D.**, and **Dr. Ridling Margaret Waller, Ph.D.**, our honorable Pro-Vice Chancellor(s) and **Dr. R. Elijah Blessing, Ph.D.**, our respected Registrar for giving me this opportunity to do the internship.

I would like to thank **Dr. Ciza Thomas, M.E., Ph.D.**, Dean, School of Engineering and Technology for her direction and invaluable support to complete the same.

I would like to place my heart-felt thanks and gratitude to **Dr. J. Immanuel John Raja, M.E., Ph.D.**, Head of the Division, Computer Science and Engineering for his encouragement and guidance.

I feel it a pleasure to be indebted to, Dr.Vidhya K, Designation, Division of CSE & Mr. Abhishek Nandy , Intel Designation for their invaluable support, advice and encouragement.

I also thank all the staff members of the School of CST for extending their helping hands to make this in Internship a successful one.

I would also like to thank all my friends and my parents who have prayed and helped me during the Internship.

Team Name: Error 404

Team Members

The project was carried out by :

- Thejaswini Kishore – thejaswinikishore@karunya.edu.in
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Mentor

I would like to express my gratitude to my mentor for providing constant support and guidance throughout the internship.

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- Mr. Abhishek Nandy(Industrial Mentor) - abhisheknandy@theprograms.in

Design and Implementation of ATP Machine Controller

Abstract— ATPs are designed to collect payment from consumers by cash, cheque, or DD. It will be unmanned and can be operated by the customers 24/7. It accepts cash/cheque/DD/pay order, issues an acknowledgment on every payment made and is a touchscreen and multimedia-based system. When the customer places the voucher/bill in the designated slot under the barcode scanner, the ATP will automatically get started. Suitable prompts are provided for guidance.

The ATP captures data from the voucher/bill and will display parameters on the monitor. A customer needs to choose the mode of payment. Once the amount is confirmed by the customer, the ATP will give directions on cash/cheque insertion. Parameters such as cheque number etc are read from the MICR fields and an acknowledgment is issued to the customer with the bill.

Introduction:

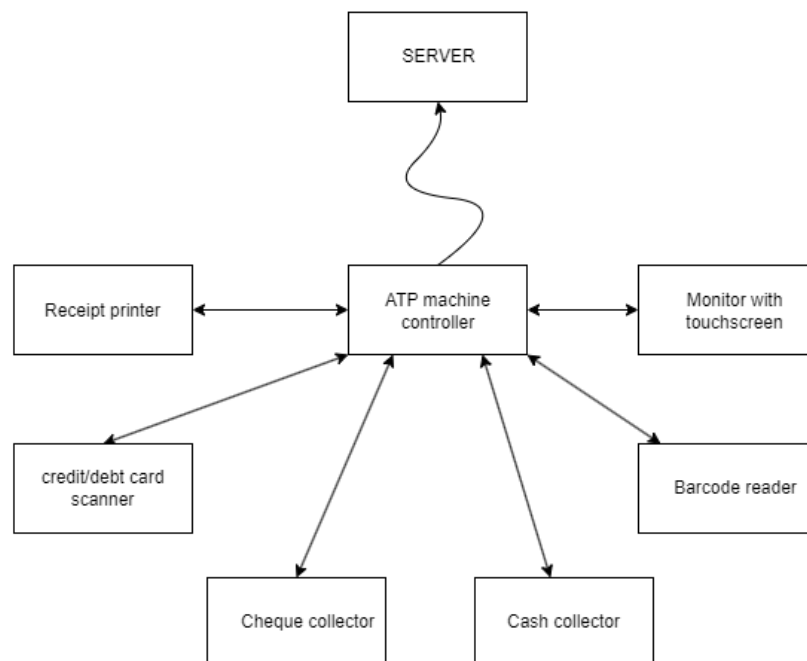
The ATP machine is an automatic machine which is used for the payment of electricity bill. ATPs are designed to collect payment from consumers by cash, cheque, or DD. It will be unmanned and can be operated by the customers 24/7. It accepts cash/cheque/DD/pay order, issues an acknowledgment on every payment made and is a touchscreen and multimedia-based system. When the customer places the voucher/bill in the designated slot under the barcode scanner, the ATP will automatically get started. Suitable prompts are provided for guidance. The ATP captures data from the voucher/bill and will display parameters on the monitor. A customer needs to choose the mode of payment. Once the amount is confirmed by the customer, the ATP will give directions on cash/cheque insertion. Parameters such as cheque number etc are read from the MICR fields and an acknowledgment is issued to the customer with the bill.

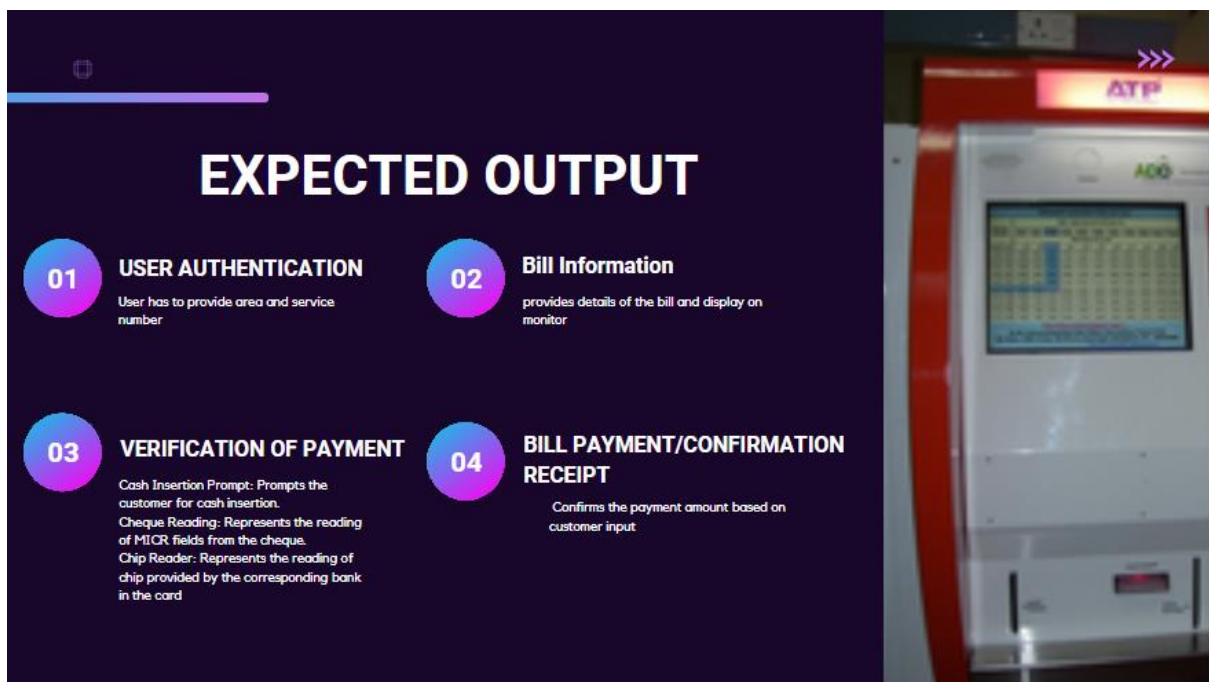
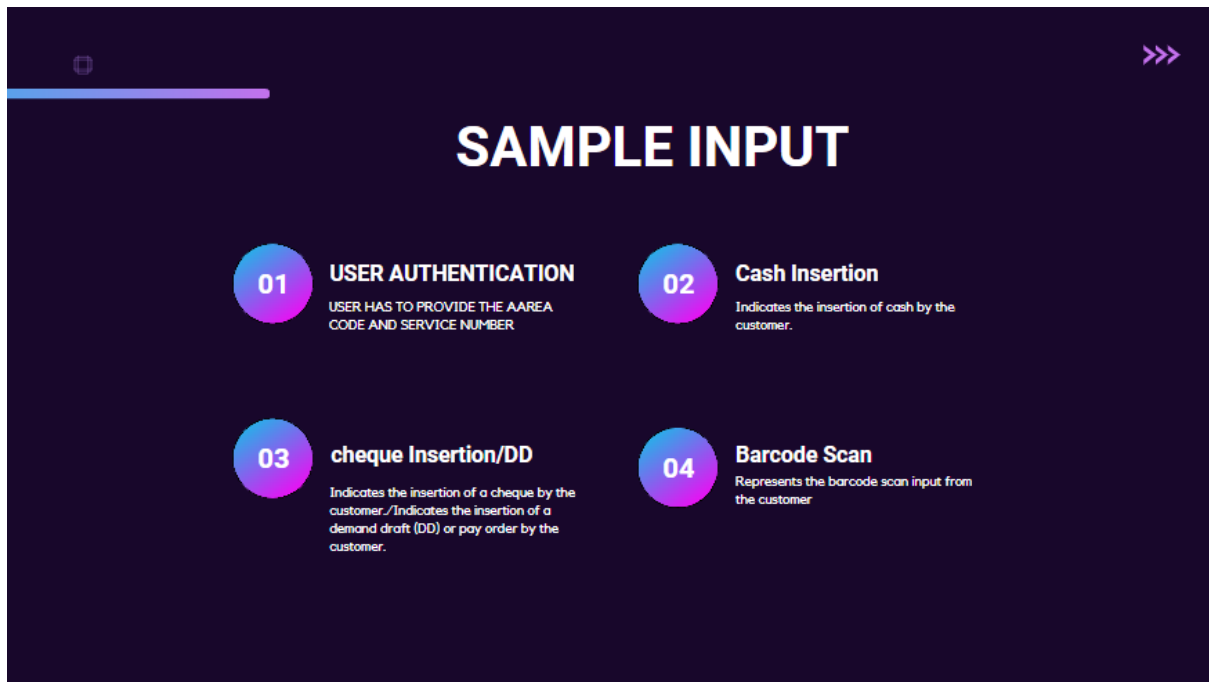
The ATP Machine has a touch screen, through which the consumers can enter their Service Number and pay the amount and get a receipt/statement of the amount paid. The machine has the provision to take currency notes. A separate slot will accept cheques in the same manner.

Machines of this new category are generally called Anytime payment kiosks. Apparently similar to the development of traditional mobile phones into smartphones, ATP machines have also progressively, though at a much slower pace, evolved into smart machines. Newer technologies at a lower cost of adoption, such as the large digital touch display, internet connectivity, cameras and various types of sensors, more cost-effective embedded computing power, digital signage, various advanced payment systems, and a wide range of identification technology (NFC, RFID, etc) have contributed to this development.. Integrated sensors and cameras also represent a source of such data as customer demographics and other locality-specific information. It also enables better customer engagement.

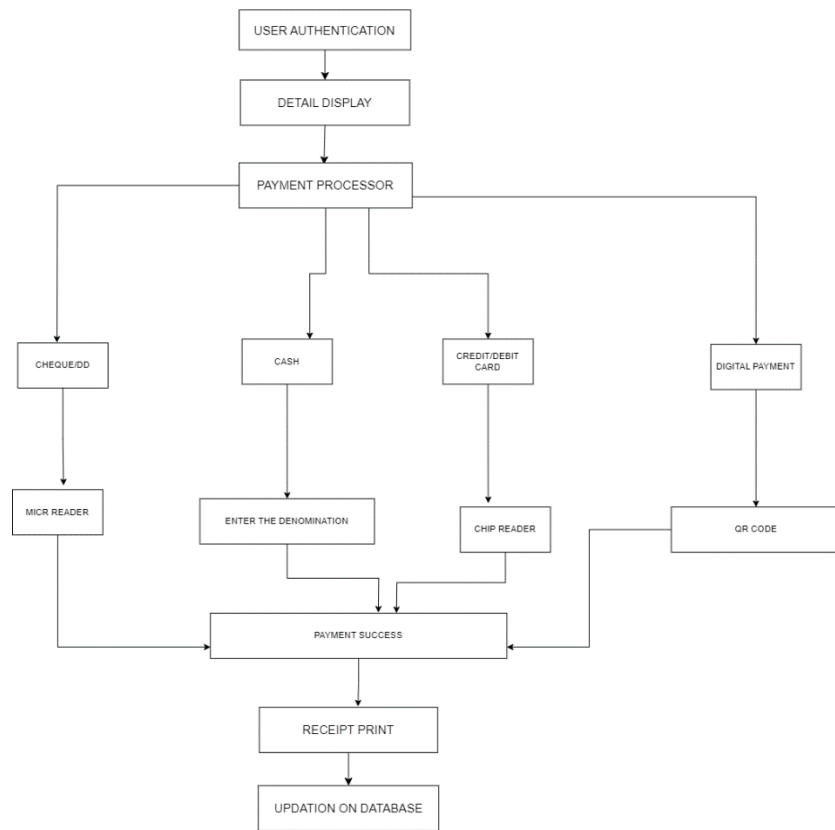
BLOCK DIAGRAM:

Block diagram with basic components:





FLOWCHART:

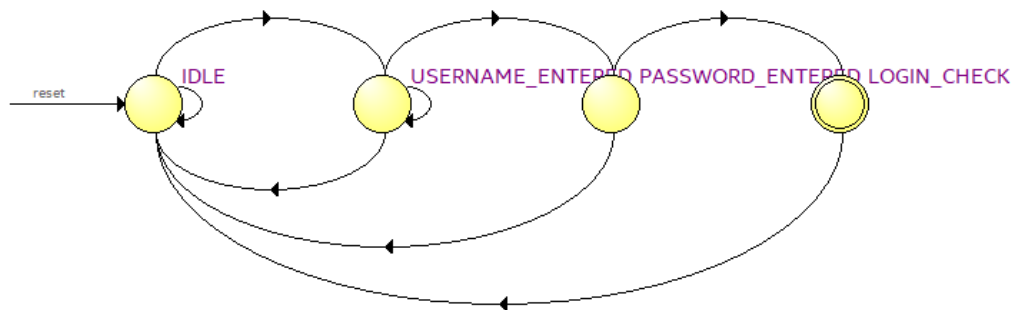


FINITE STATE MACHINE(MEALY):

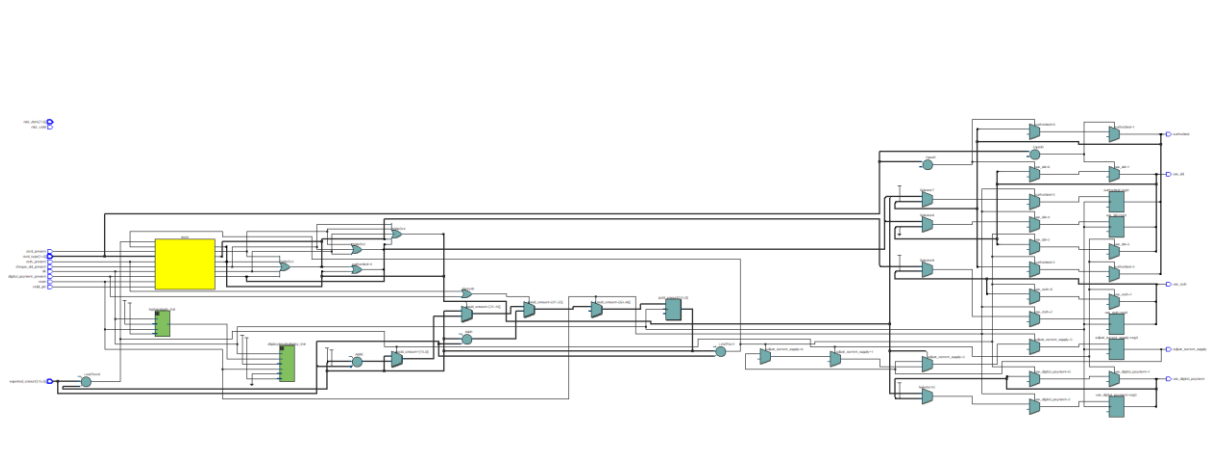
The finite state diagram for the ATP system. Based on the problem statement, we can identify the following states:

1. IDLE: The initial state of the ATP.
2. STARTED: The ATP has been started, and an acknowledgment is issued with the voucher data.
3. CONFIRM_AMOUNT: The customer confirms the amount to be paid.
4. INSERT_CASH_CHEQUE: The customer inserts cash/cheque.
5. PROCESSING: The ATP processes the cash/cheque.
6. COMPLETED: The transaction is completed, and an acknowledgment is issued with the total amount and electricity charge.

FSM (Mealy)		
STATE	INPUT	NEXT STATE
Start	-	Idle
Idle	Service number and area code	Verification
Verification	-	Payment processing
Payment processing	Cheque/DD insertion Credit/Debit card insertion QR Code scanning, Cash insertion	MICR Reading Chip Reading Generating Acknowledgement
Reading MICR or Chip data	-	Generating Acknowledgement
Generating Acknowledgement	-	Reset
Reset	-	Idle



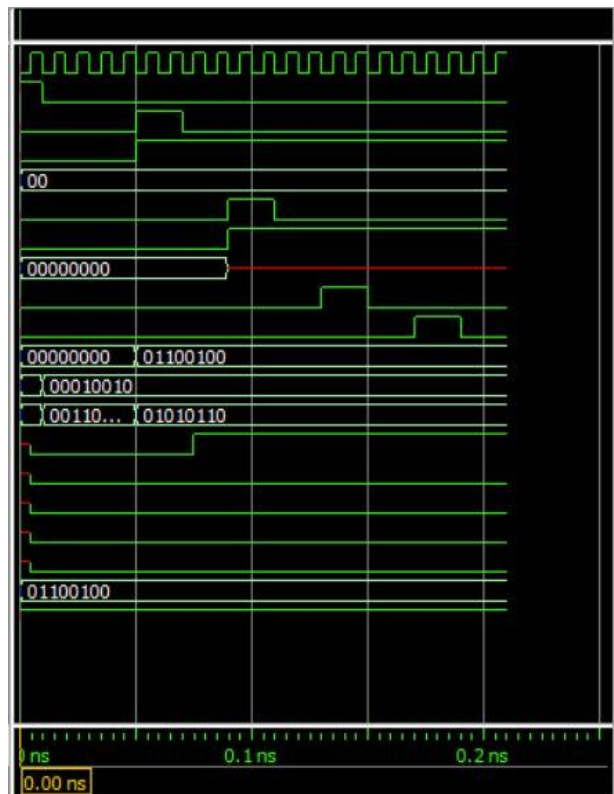
RTL VIEWER:



Compilation Report:

Flow Status	Successful - Fri Jul 14 19:46:49 2023
Quartus Prime Version	18.1.0 Build 625 09/12/2018 SJ Lite Edition
Revision Name	ATP
Top-level Entity Name	ATP
Family	Cyclone V
Device	5CSEMA5F31C6
Timing Models	Final
Logic utilization (in ALMs)	N/A
Total registers	27
Total pins	39
Total virtual pins	0
Total block memory bits	0
Total DSP Blocks	0
Total HSSI RX PCSs	0
Total HSSI PMA RX Deserializers	0
Total HSSI TX PCSs	0
Total HSSI PMA TX Serializers	0
Total PLLs	0
Total DLLs	0

Waveform:`



Result:

The ATP machine was successful, with the additional features of printing receipt along with adding the excess amount to the wallet. The ATP machine is successful in meeting the specifications laid out prior to the design.