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Why DineMate? Problem Analysis

Traditional Challenges

- Manual ordering causes delays and miscommunication errors
- Limited staff availability during peak hours
- Post-COVID demand for contactless dining experiences increases

VS

Our Solution

- Automated menu ordering eliminates human error
- Efficient staff resource allocation and management
- Safe contactless ordering system implementation

Project Objectives and Goals

Automation Goals

- Automate restaurant menu ordering process
- Eliminate manual order taking errors
- Streamline kitchen workflow operations
- Reduce customer waiting times

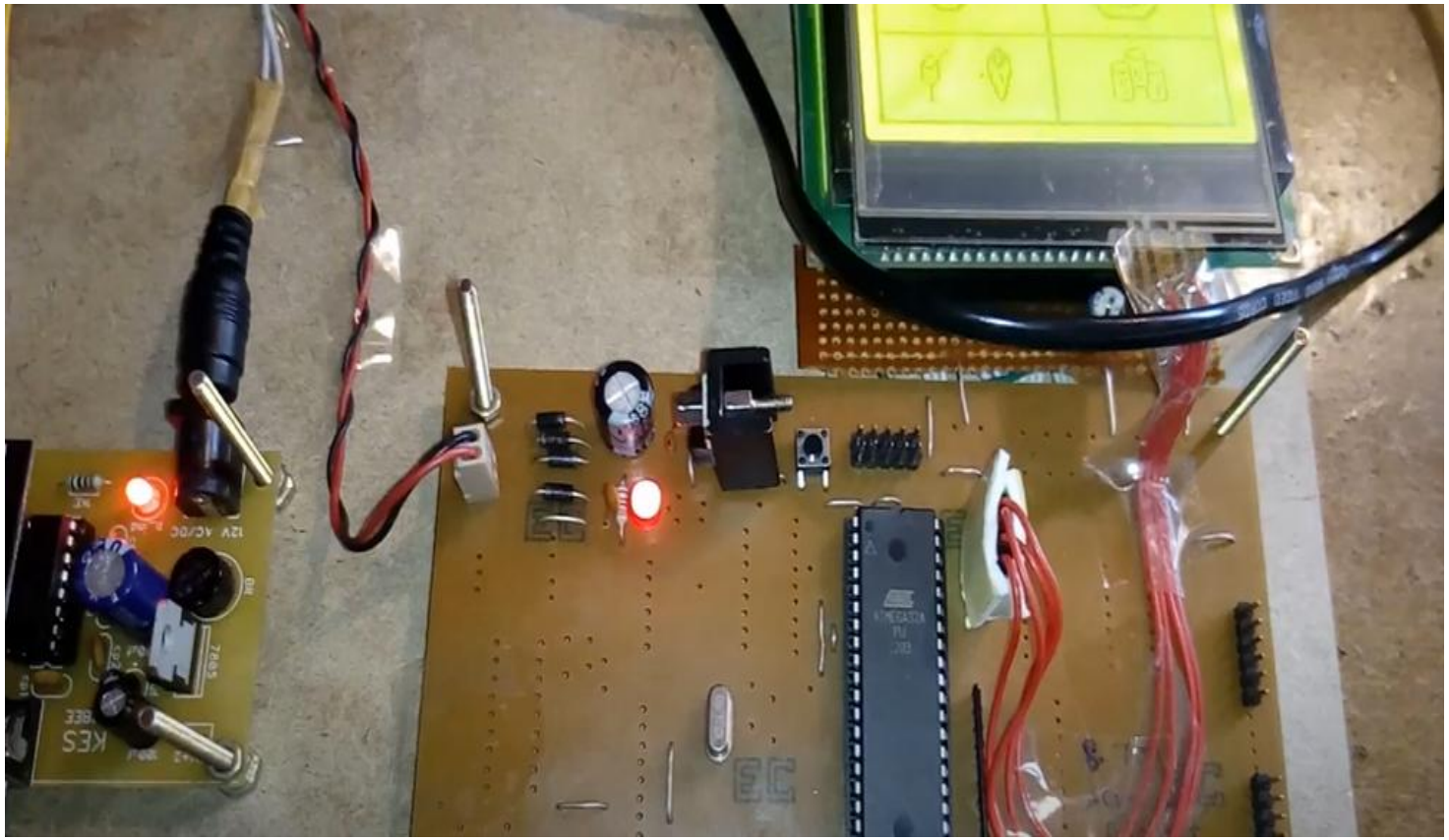
Technical Requirements

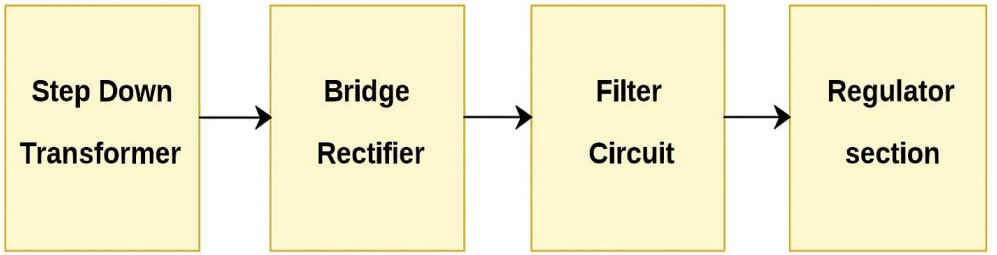
- Ensure low-power wireless communication
- Implement secure data transmission
- Demonstrate embedded system integration
- Achieve reliable order processing

Performance Targets

- Improve order accuracy significantly
- Enhance operational efficiency metrics
- Reduce service response times
- Optimize resource utilization effectively

CIRCUIT & POWER FLOW





System Architecture

User Module

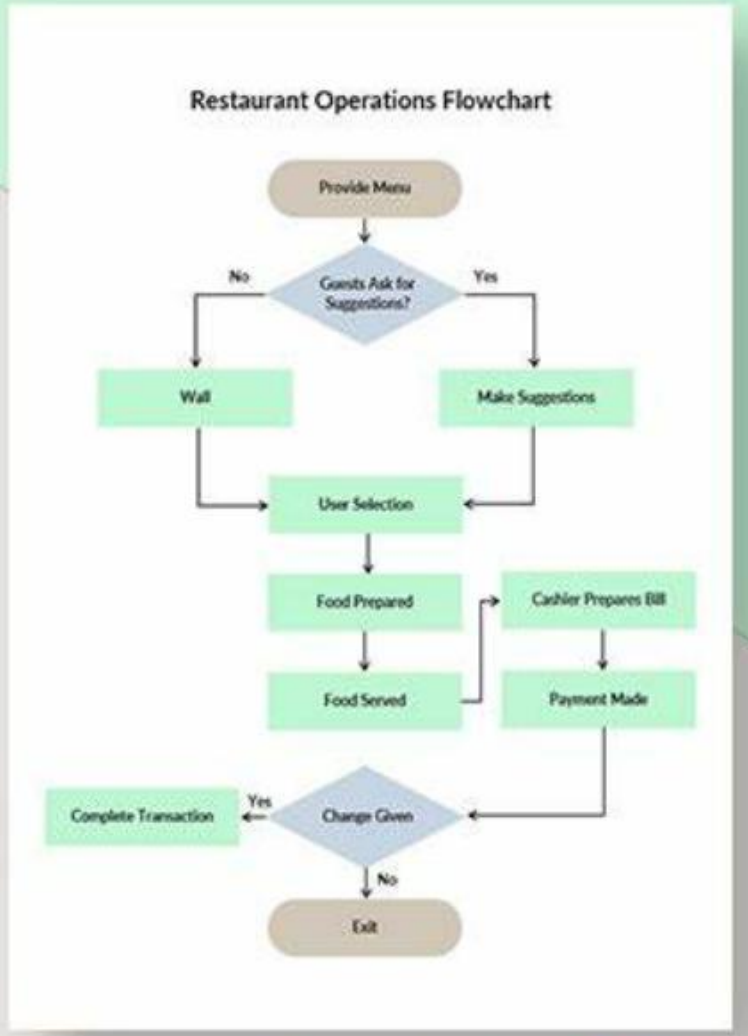
Customer interface device located at dining tables featuring menu selection capabilities and order confirmation through LED feedback system

Communication Layer

Zigbee wireless protocol enables secure low-power data transmission between table units and central kitchen receiver system

Kitchen Receiver

Central processing unit that receives orders from multiple tables and displays them for kitchen staff preparation and tracking



ATmega32

Main Controller

Zigbee

Communication Module

LM1117

Voltage Regulator

LED

User Interface

Microcontroller Unit

ATmega32 serves as the central processing unit handling all system operations and control logic implementation

- 8-bit AVR microcontroller with 32KB flash memory
- Multiple GPIO pins for interfacing with external components
- Built-in UART for serial communication with Zigbee modules

Communication Hardware

Zigbee modules provide reliable wireless communication between table units and kitchen receiver systems for order transmission

- Low-power 2.4GHz wireless communication protocol implementation
- Mesh networking capability for extended range coverage
- Secure data transmission with encryption and authentication features

Power Management

Voltage regulation circuits ensure stable power supply for all system components using LM1117 and 7805 regulators

- LM1117 provides regulated 3.3V for Zigbee modules
- 7805 regulator supplies stable 5V for microcontroller
- LED indicators provide visual feedback for users

Software Implementation

Development Environment

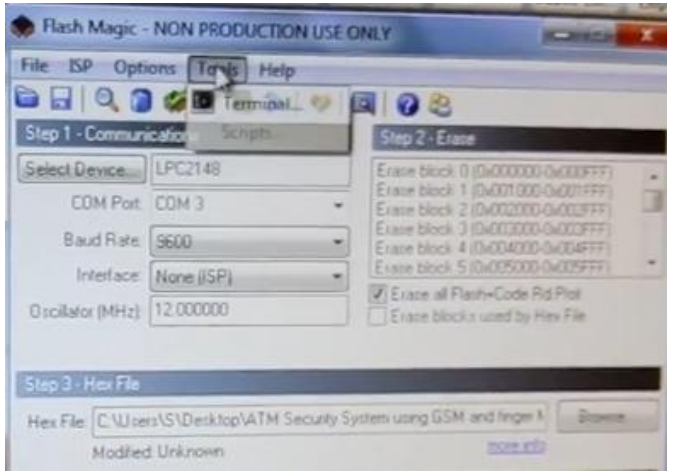
AVR Studio IDE used for embedded C programming with comprehensive debugging tools and simulation capabilities for microcontroller development

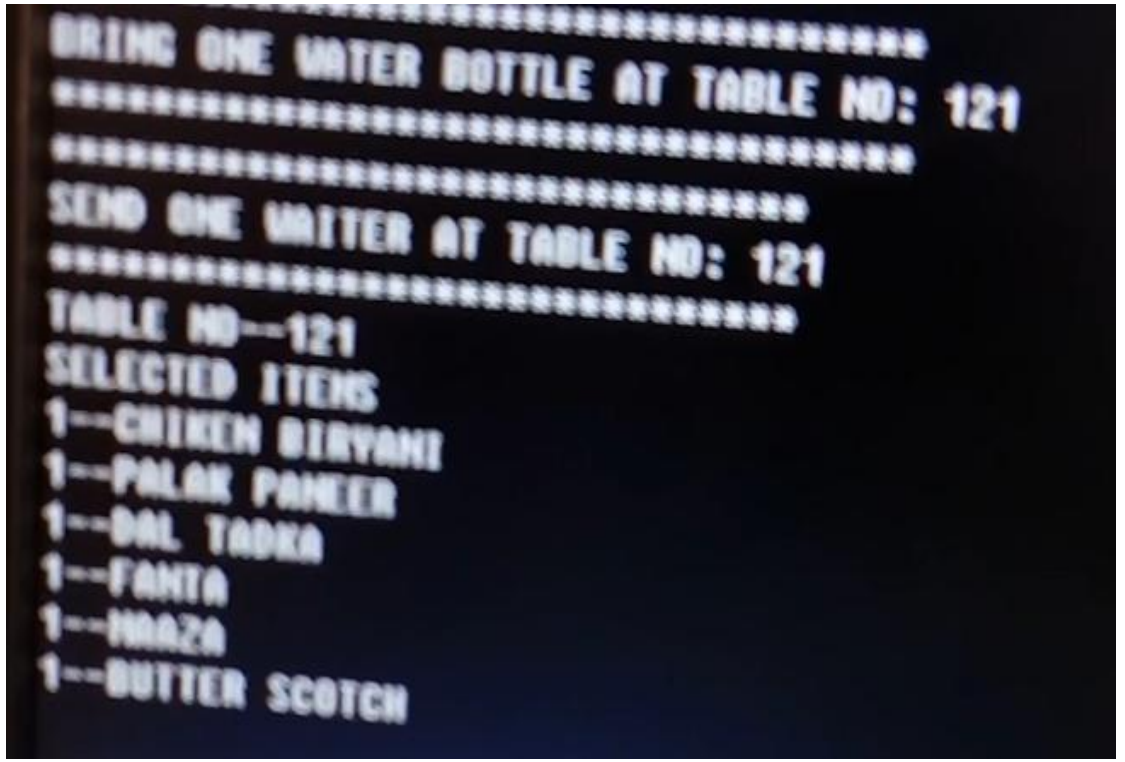
Core Logic

Menu selection algorithms, order transmission protocols, and LED feedback systems implemented using structured embedded C programming language

Let’s Order


[From:192.168.1.104:32772]
I'm TCP Client.dfadfadsfdfdafdfadf


Flash Magic - NON PRODUCTION USE ONLY
File ISP Options Tools Help
Terminal
Scripts
Step 1 - Communication
Step 2 - Erase
Select Device...
LPC2148
COM Port
COM 3
Baud Rate
9600
Interface
None (ISP)
Oscillator (MHz)
12.000000
Erase all Flash+Code Rd Prot
Erase blocks used by Hex File
Step 3 - Hex File
Hex File
Modified: Unknown

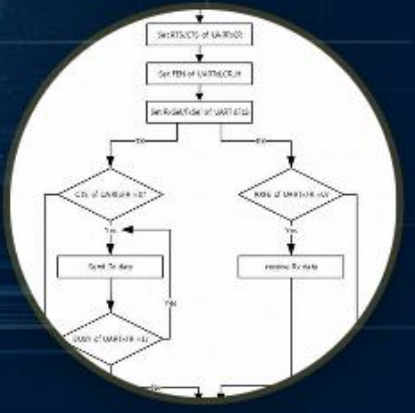

BRING ONE WATER BOTTLE AT TABLE NO: 121
SEND ONE WAITER AT TABLE NO: 121
TABLE NO--121
SELECTED ITEMS
1--CHIKEN BIRYANI
1--PALAK PANEER
1--DAL TADKA
1--FANTA
1--MAAZA
1--BUTTER SCOTCH

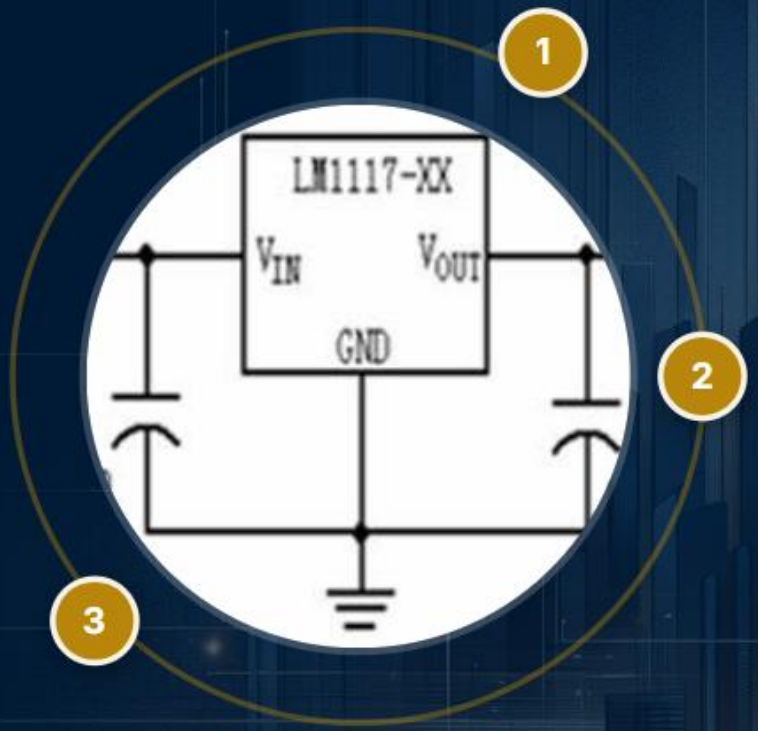
Zigbee Communication

Zigbee protocol selected for low-power consumption, reliable short-range communication, and mesh networking capabilities essential for restaurant environments requiring stable connectivity

Data Flow

UART serial communication enables seamless data transfer between ATmega32 microcontroller and Zigbee modules for efficient order transmission from tables to kitchen





LM1117 Regulation

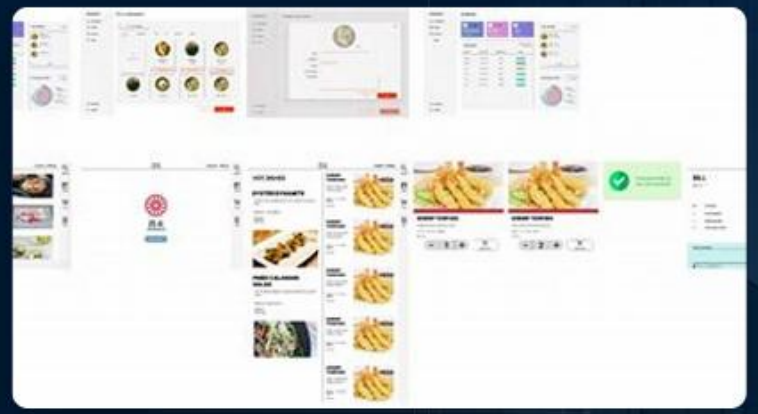
Provides stable 3.3V output for Zigbee modules ensuring consistent wireless communication performance and preventing voltage fluctuations that could disrupt signal transmission

7805 Stability

Delivers reliable 5V supply to ATmega32 microcontroller maintaining optimal processing performance and preventing system resets or malfunctions during operation

Efficiency & Safety

Voltage regulation circuits incorporate thermal protection and overcurrent limiting to ensure safe operation while maximizing power efficiency for extended battery life



Key Benefits

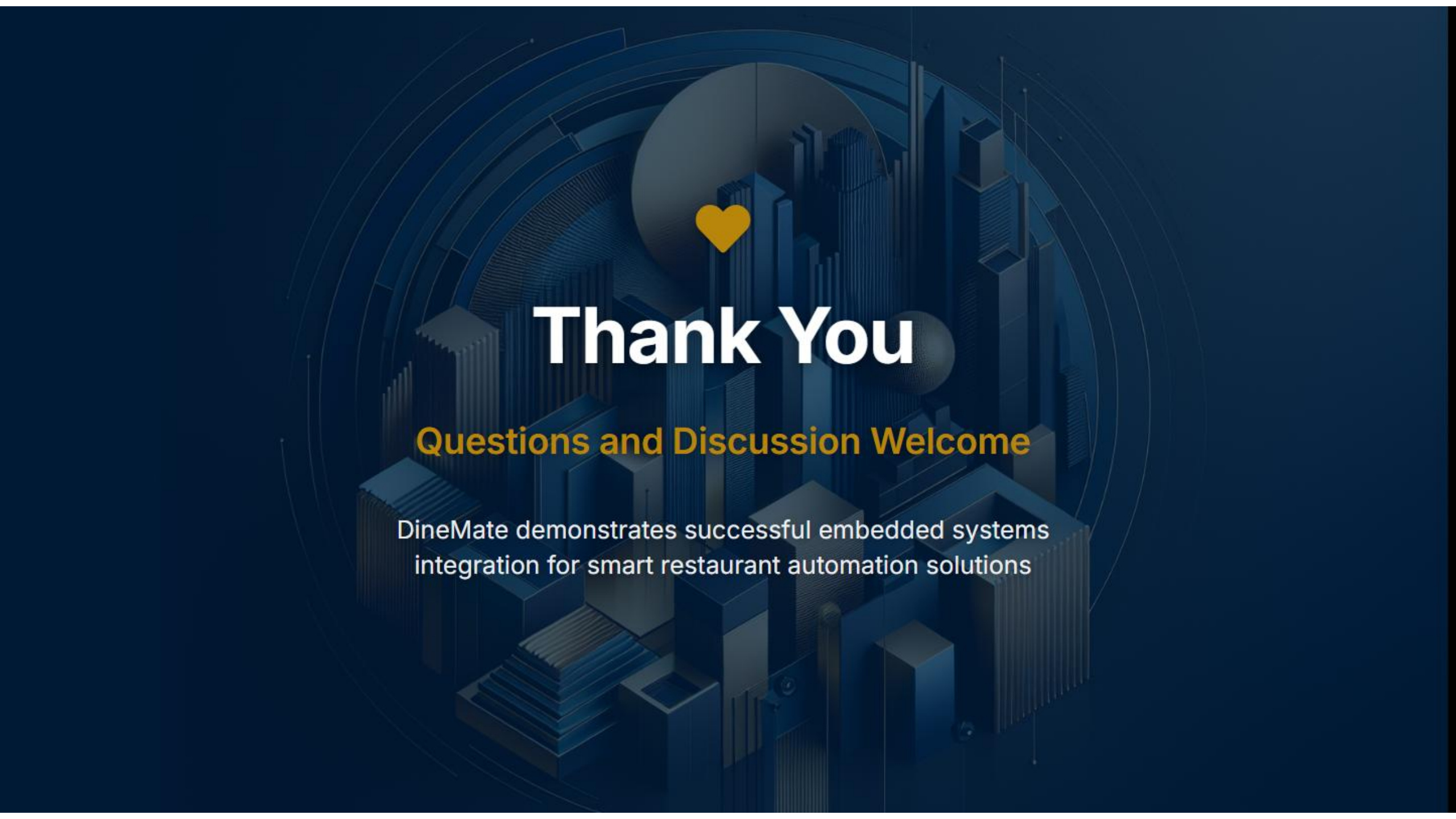
Achieved significant improvements in order accuracy, reduced waiting times, optimized staff allocation, and enhanced operational efficiency across restaurant workflow processes

Current Results

Successfully developed working prototype demonstrating automated ordering with faster service delivery, reduced manual errors, and improved customer satisfaction through contactless interaction

Future Scope

Planned enhancements include touchscreen interface integration, mobile application connectivity, secure payment gateway implementation, and advanced analytics dashboard features


Thank You
Questions and Discussion Welcome
DineMate demonstrates successful embedded systems integration for smart restaurant automation solutions