VIRTUAL REALITY BASED FOOD SUPPLY SYSTEM IN SMART RESTAURANT FOR MENU ORDERING SYSTEM

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ABSTRACT

Simplicity and ease of access of a menu are the main things and easy for ordering food in the restaurant. A hologram-based menu. Completely revolutionizes the patron's dinning experience. In traditional ordering system the waiter notes down the order from the customer and places the order to the kitchen. The billing is done at the end of dining which consumes time and may also have errors. The solution can be obtained by automating the food ordering and billing process in restaurant thereby improving the dining experience of customers. In the proposed system, the Augmented reality-based food serving system provides the menu of the food items using hologram focused on the dining table. The simplicity and case of access of a menu facilitates efficient food ordering in a restaurant. The menu selected by the customer will be notified to the kitchen department of the hotel using the Zigbee Wireless Transmission module, where request to order the food in the kitchen section is fully automated, thus reducing the waiting time of the customers and achieving efficient food ordering. The alert in the kitchen section is given by the Arduino Uno controlling the LCD display. The DOTNET and the Embedded C is used as programming tools for the project. This work mainly aims at increasing the efficiency for restaurants and caterers by saving time, reducing human errors and by providing higher quality customer service.
Keywords—Hologram,Zigbee,LCD Display.

1. INTRODUCTION

Most of the restaurant industries are looking for any application that enhances the dining experience as well as increase the profit. This hologram menu completely revolutionizes the patron's dining experience. Holographic AR-overlay digital objects in real-life environment. Hologram is a type of augmented reality device creates an 3D image in real environment. The augmented reality-based food serving system provides the menu of the food items using hologram focused on the dining table. We always appreciate the quality of service provided by the restaurants if they serve as per our needs and this all depend on the dining and the quality of service provided by them to the customers. But sometimes there is a delay in this service and it is not totally fault of

either the hotel-staff due to work load of taking continuous orders and customers are also in a fast to move ahead in their routine work. So, remedy to this issue is that we have designed a smart restaurant menu ordering system the menu selected by the customers will be notified to the kitchen department.

PROBLEM STATEMENT

Consume time for placing order in the kitchen, time for the billing, time to sort out manual errors in orders, serving and billing process.

OBJECTIVE OF THE PROJECT

The proposed system includes wireless technology in hologram. It is fully based on paperless menu. The menu card is projected in that the transmitter and receiver section of the Zigbee for the wireless transmission. It makes the ordering easier by making the process fully automated from the customer table. In hologram, which detects wavelength distribution of a light source using a Multiplex Fresnel Hologram. The image has been captured by camera and the interference pattern is used to identify the items selected. The same is communicated to the kitchen section. Based on this proposed method, the following objectives are framed. • To automate the conventional food ordering system with the hologram-based serving system using wireless technology. • To display the Ordered food items in the kitchen Section. • To design virtual reality system to avoid human error during this pandemic situation.

2. EXISTING SYSTEM

Manual Service with menu card. There is no hologram facility. Manpower is used in the existing system where the waiters take the order using pen and paper. The traditional system involves errors while note down the orders. In this paper, we discuss in an internet of things environment our solution regarding context management in the area of food services. We propose a system that allows to automate the different services offered in a restaurant and to connect the various equipment of this restaurant, in order to simplify and facilitate the work of employees using this system.
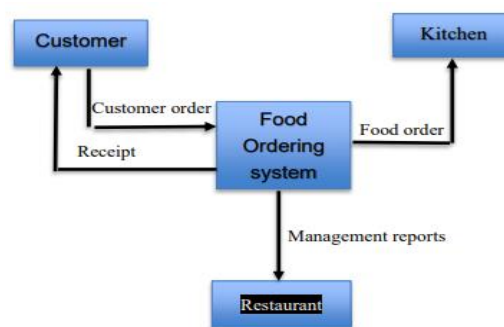

Fig 1. Existing Block Diagram

A. BLOCK DIAGRAM
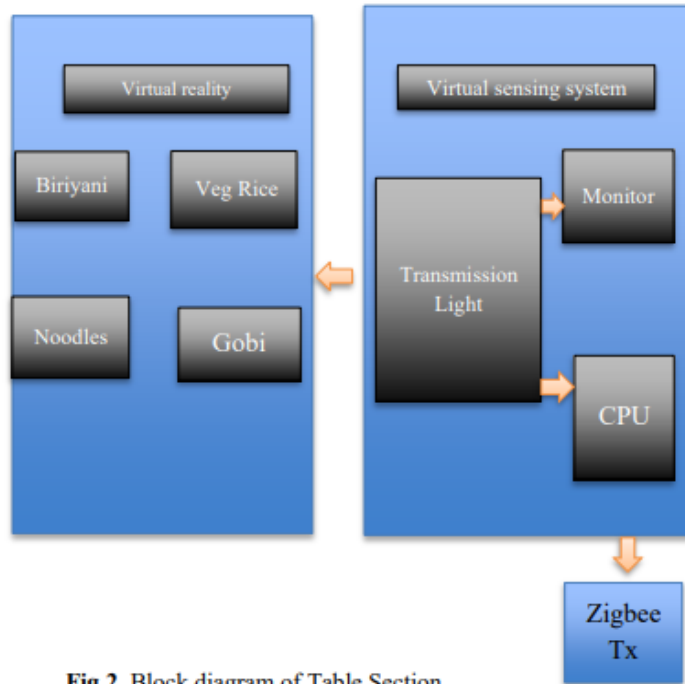
TABLE SECTION

Fig 2. Block diagram of Table Section
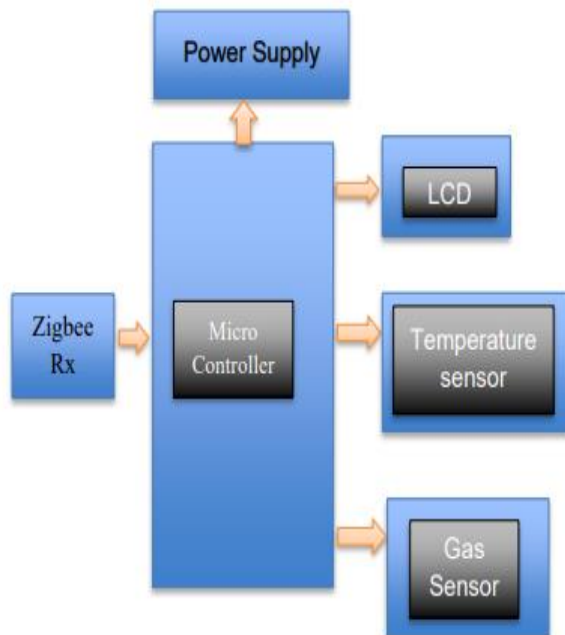
RECEIVER SECTION

Fig 3. Block Diagram of Receiver Section

The kitchen section receives the orders through LCD display. Orders will be displayed in the LCD

along with the table number. Temperature sensor will show the current temperature of the kitchen and Gas sensor also placed in the kitchen section.
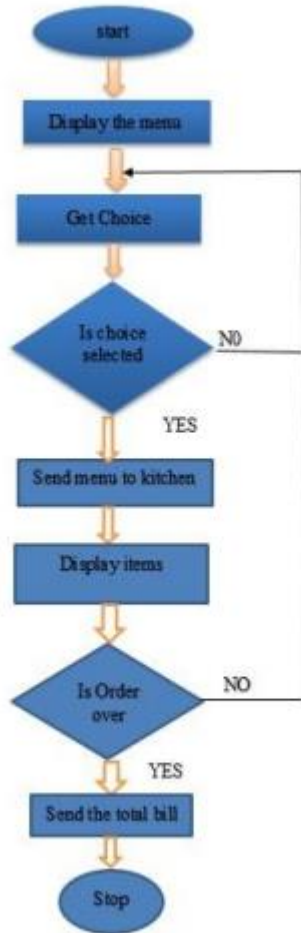
D.PROJECT FLOW

Fig 4 Work Flow

The **Fig 4** shows that the process gets started by displaying the menu of the food items on the restaurant table by using the hologram projection. The customer can choose their favorite and desired food by just tapping to the projections in their table and this provides the input to the system. Once the choice is selected it is notified in the kitchen section wirelessly. The kitchen section will have display unit to notify the bearers and chef about the food being ordered by the customers. The kitchen section will have the display of the food items for the corresponding table and the customers are provided with the additional module of payment. Once the food selection gets over, the customers can view their total bill amount in the table. This can help them to have a digital payment at the billing counter of the restaurant. The selection of multiple food items can cause the crash in the system at the receiver section, so to avoid this, the dedicated display unit for each table is used to place the orders continuously at the kitchen section. The deletion module here has an advantage of providing the deletion option to the customers if they select the food items wrongly or willing to change their selection. So this deletion of food can be done within a certain time from choosing the item in the menu with the help of the timer. This total system thus can

reduce the valuable time of the customers and give them a satisfied experience thereby helping to build businesses.

3.RESULTS AND DISCUSSIONS

The hardware implementation of the work was done which has the entire menu card displayed on the table using the hologram. The order is placed automatically using the displayed items and it is processed to the kitchen section. The amount is displayed automatically once the finish button is clicked.The output of the Arduino is connected to the LCD and a virtual terminal is used to obtain the inputs from the customers. The image is captured by the web camera and the interference pattern is used to identify the items selected. The same is communicated to the kitchen section.

Fig 5 Menu card
The **Fig 5** shows the menu card displayed at the table section to the user.
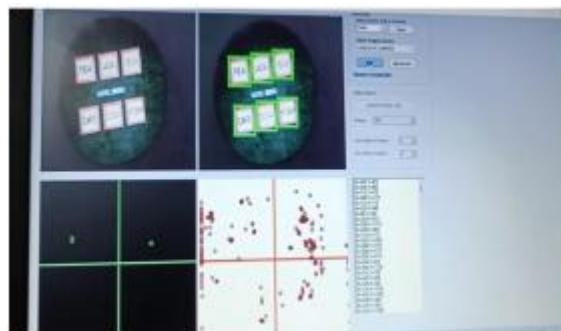

Fig 6 Output display at the kitchen section
The **Fig 6** shows the chosen view of user choice in the menu card this is Transmitted at the Kitchen section.
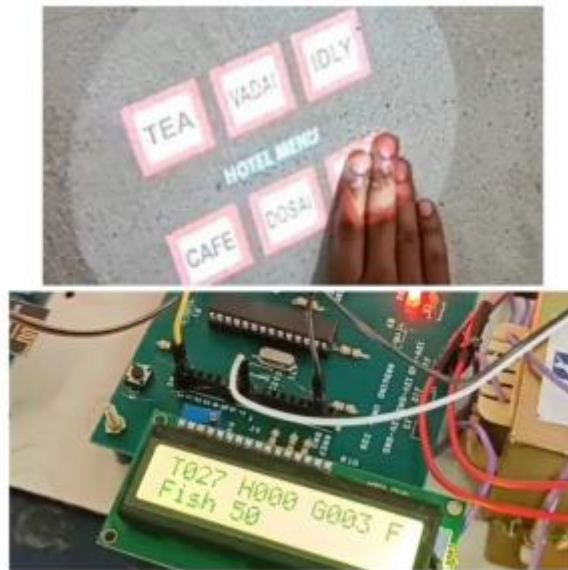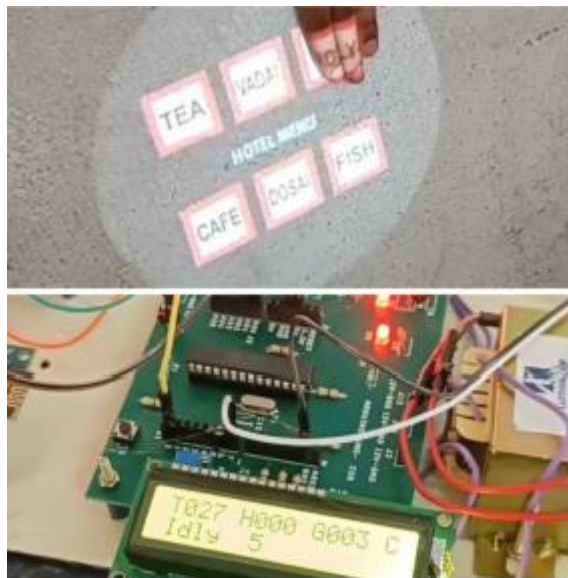
Fig 7 Output Display at the User
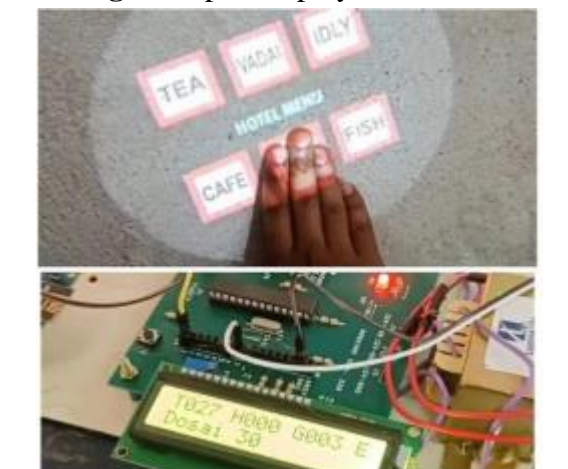

Fig 8 Output Display at the User

Fig 9 Output Display at the User

The **Fig 7,8,9** shows the user touches the menu card which was displayed at the user end.

Fig 10 Total Bill

The **Fig 10**shows the total bill generated to the user through LCD at the end and using G-pay the user can pay the bill from the table without any manual interaction.

4.NOVELTY IN THE PROJECT
Fully automated. Hologram based tablets would recommend dishes based on a recommendation which has not implemented elsewhere. Easier for the diners to flip, swipe & tap through the menu. Less time consumption

CONCLUSION
In Conclusion, Hologram technology has a big feature ahead. Smart restaurant is developed in order to provide an easy interaction between customers through wireless technology. Orders can be made easily through this system. It will change the way people eat up and their eating affinities Hologram revolutionizes the dining experience and also easier for the dinners to flip, swipe and tap through the menu. In future can also add different payment options such as Google pay, paytm, Phone pe etc. This future can also be added in future along with improvement in quicker and simpler, responsive userfriendly interface and also for parking system.

REFERENCES
1. Toward a smart restaurant with context management, NesrineKoubai; Fayçal Mohamed Bouyakoub; MeriemSabrineHalilali; Islam Mohamed Amine Medad,2019.
2. Jedidiah Harpanahalli; Kevin Bhingradia; Pranav Jain; JayasudhaKoti, Smart Restaurant System using RFID Technology, 2020.
3. Eduardo Beatriz Remeseiro; Marc Bolaños; PetiaRadeva, Grab, Pay, and Eat: Semantic Food Detection for Smart Restaurants, 2018.

4. Vindhya Liyanage, AchiniEkanayake, Prabha Shi Munasinghe , Samantha and HiranthiPremasiri, Foody - Smart Restaurant Management and Ordering System;2019.

5. McGregor et al., "A Cloud-Based Platform for Supporting Research Collaboration," 2015 IEEE 8th International Conference on Cloud Computing, New York City, NY, 2015, pp. 1107-1110, 2015.

6. J. Park, K. Lee, and Y. Park, "Ultrathin wide-angle largearea digital 3D holographic display using a non-periodic photon sieve," Nature Commun., vol. 10, p. 1304, 2019 .

7. D. Wang, C. Liu, and Q. H. Wang, "Holographic zoom micro-projection system based on three spatial light modulators," Opt. Exp., vol. 27, no. 6, pp. 8048–8058, 2019.

8. K. Kamarudin, et al., "The Application of Wireless Food Ordering System," MASAUM Journal of Computing, vol. 1, pp. 178-184, 2019.

9. W. Min, B. Bao, S. Mei, Y. Zhu, Y. Rui, and S. Jiang, ―You are what you eat: Exploring rich recipe information for cross-region food analysis,‖ IEEE Trans. Multimedia, 2017.

10. J. Chen, C. Ngo, and T. Chua, ―Cross-modal recipe retrieval with rich food attributes,‖ in ACM Multimedia Conference, 2017, pp.1771– 1779.

11. G. Ciocca, P. Napoletano, and R. Schettini, ―Food recognition and leftover estimation for daily diet monitoring‖ in International Conference on Image Analysis and Processing, 2015, pp. 334–341.

12. G. Raimato, ―The Design of a Smart Tray with Its Canteen Users: A Formative Study ‖ in Int. Conference in Methodologies and Intelligent Systems for Technology Enhanced Learning, vol. 617, 2017, p. 36.

13. H. Kagaya, K. Aizawa, and M. Ogawa, ―Food detection and recognition using convolutional neural network,‖ in ACM International Conference on Multimedia, 2014, pp. 1085– 1088.

14. M. Bolanos and P. Radeva, ―Simultaneous food localization and recognition,‖ in Int. Conference on Pattern Recognition, 2016, pp. 3140– 3145.

15. Kotsovos,M.D.(2018).Structural smart restaurant:Finite-element analysis for limit-state design.UnitedKingdom:ThomasTelford.pp 497.