Paradigm To Human Technology Interaction in Food Industry Service

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ABSTRACT:

Technology is rapidly emerging with new intentions that have a deeper level of interaction with Human and Technology. Food is extremely important for survival. There are several techniques available today in food service using Human Technology Interaction. Nowadays there has been an increase in the number of applications using human interaction with technology, a well-designed computer interface in examining the limitations that the human faces while interacting with technology. The relationship between human and computers is needed to support knowledge on both human and machine side such as the programming languages and computer graphics etc. People go to the restaurants where the food service and convenience of customer are given the top priority in food service industry. Digital media has reached various types of domains like digital menus, automatic digital table and ordering kiosks. The paper aims at studying the paradigms of interaction between humans and Technology in Food Industry service.

Keyword: Food Industry Service, Food Service, Human Interaction, Human Technology interaction, Technology

I. INTRODUCTION

Human Computer Interaction is a study of designing computers/machines so that they can interact with humans. HCI also focuses on determining factors which help understand how people use Technology and functional systems. The main aim of human computer interaction is to develop a usable and safe system through which the user can interact easily and faster. Human computer interaction is closely connected to the field of User experience design. (Chinthammit, Winyu & Duh, Henry & Rekimoto, Jun, 2014)

The most common level of communication modes in human computer interaction is moment and gestures. The system rapidly responds to the user request and provides rapid acknowledgement for all the user actions such as vision, touch, text and audio etc. Based on these foundations HCI can be used in a lot of systems where interaction takes place and manual labour can be replaced by automation to make the system effective and efficient to use.

Restaurant Technology is rapidly emerging and transforming the business as hotels today are equipped by Artificial Intelligence (AI), mobile applications, kiosks and chatbots which have improved the guest experience immensely.(Aglowid IT Solutions, 2021) HCI can be used in the food industry in a variety of ways. Most of the fast-food chains such as McDonald's today use an ordering kiosk which makes food ordering easier, the customer does not have to stand in long queues whereas he can place the order through the kiosk and make the payment there itself after which they can sit at the table and the food will be delivered. Through this servicing becomes faster and efficient as well. (Leong, C., 2020)

II. OBJECTIVE

1. To study and understand human Technology interaction in the food industry.

2. To evaluate its application in food service.

3. To study how humans interact with technology using HCI interfaces.

III. LITERATURE REVIEW

Jia Wei, May 2012 stated the acceleration of HCI in the hospitality industry. To explore and identify the best practices in SBI application and its uses in the hospitality industry. The paper describes the context of HCI by giving the best definition and gathering information from various areas within the hospitality industry. The paper shows physical aspects of interaction around human senses such as vision for audio and touch.

Gianluca Paravati and Valentina Gattes, 7th August 2015 describe the special issues on HCI in the smart environment using technology and its solution towards the use of mass market sensors in current and emerging applications for interacting with small environments. The paper analyses different interactions including gesture recognition, Eye/Gaze trackingetc and all the related issues associated with it.

Winyu Chinthammit, Henry Been -Lirn Duh, Jun Rekimoto, April 2014 stated how HCI can improve the Food Industry with suitable information for food processing. The paper describes how food production industries do not contribute in the decision making which can be challenging to the farmers. Using HCI the food processing industry can improve the processing and also provide right information and tools for making decisions.

IV. CONTEXT OF HCI

Interaction model serves as a way to understand how to interact with the user and system and what the user wants and what the system does. There are a number of ways in which the user can communicate with Systems or Technology. The context in Human Computer Interaction refers to the condition under which the system is being used.(James Lee, 2016) Understanding the context, describes how the computer/software system can interact with the human in the day-to-day life. It is extremely important to carry out tests, meetings and sessions correctly in the context of the system to get the result about the findings accurately. HCI consists of three parts: The User, The Computer and The Interaction.

The User: The user context in HCI refers to an individual user or group of users working together to interact with the system. Human sensory systems such as Vision, Touch and Hearing play a vital role in HCI. Also, different people have different methods of learning, preserving knowledge and conceptualizing interaction.

The Computer: The computer context in HCI refers to technology ranging from palmtops to large scale computers. A computer system through which the user can interact to make its task easier and faster at the same time. In the food service, the computer context basically refers to the ordering kiosk through which the user interacts with to place their order.

The Interaction: The interaction context in HCI refers to ensuring that both the user and the computer get along with each other and then interact successfully. While ordering food through the kiosk, we need to take into consideration the ways in which the user will be able to interact with the system easily and effectively. The user uses various computer tools to perform and simplify or support tasks.

V. APPLICATIONS IN FOOD INDUSTRY

A. *Self-ordering food kiosk:* Food Ordering Kiosks are becoming popular these days as they are fast. In traditional restaurants/Hotels, the customers have to wait for the waiter to come and take the order, if the restaurant is busy the customer might also have to wait for a longer period of time which can leave a bad impression on the customers. With a Self-ordering kiosk, the tables in the restaurant have a QR code which the user can scan and place their order. A few fast-food chains also have Self-ordering kiosks through which the user can place their order and make payment accordingly.

B. *Food Ordering Robots:* Restaurants today are migrating to automation where they are replacing manual labour of human to technology, allowing the customer to directly interact with the system. The robots have a small tablet attached to them that the customer uses to place their order. When a new customer arrives, the robots are trained/programmed in such a way that they go to their respective table where the customer is sitting and then the customer can interact with the system to order the food.

C. *Food Ordering through Face Recognition:* Restaurants utilise Face Recognition Technologies, letting their customers directly interact with display screens during ordering and payment. Customers stand in front of the kiosk which captures their facial expressions/moods using software. All the information regarding the customers is stored in the machine and is preserved for future use which can be used when the customer visits the restaurant again. It stores past orders and customers can reorder a

frequently ordered meal, favourite meal or the system will suggest a new meal based on their past preferences. It is especially useful for those restaurants working at high volumes or at busypeak times.

D. *Food Ordering through Speech Recognition:* Customers order from their favourite restaurant via Voice Integrated Technology such as Google and Alexa. Some restaurants are integrated with AI for self ordering. Customers also order faster using voice technology through devices or mobile apps and the webpage synchronises this information so customers can get orders throughout the entire system. Customers can place orders entirely through phone enabled artificial intelligence systems. Dominos is already implementing this kind of technology.

E. *Kitchen display system:* In the kitchen display system, the system upon receiving the order transfers the order to the kitchen where the chefs can see what is being ordered and then can start preparing accordingly. In this system the chef or the kitchen staff does not have to wait for the waiter to come and then give the order, rather the order is transmitted faster with the help of the Kitchen Display System.(SmartSense, 2018)

F. *Smart Restaurant Table:* The restaurants use touch tables in intelligent system management. The table is a touch screen through which the customer can go through the menu and place their order. They can even customise their dishes by adding their favourite toppings to the pizza. Once the order is placed the payment options are also available on the smart table through which the customer can pay after eating.

VI.   FOUNDATION OF HCI APPLICATION'S

Humans have senses such as touch, sight, hearing, smell and taste etc. The sensing organs sense and send information to the brain to help and understand the world.(MoodMedia, 2017)

A. *Touch:* It helps human beings to understand the world with just touch and is extremely important for those who are visually impaired. The high-end dining establishments use the touch screen in favor of the traditional personal touch in taking orders, fast-food and moderately-priced restaurants are increasingly letting customers' fingers do the ordering.

B. *Cognitive*: As an advanced system interacts with humans in a natural form. The system learns & imitates the human thought process. Customers interact with the help of robotic process automation.

C. *Audio*: The sense of hearing plays an important role in humans. Speech recognition is generally considered as an ability of the computer through which it can recognize human speech.

D. *Affective:* The Interaction between user and system becomes a physiological process and states including feelings, emotions and affective expressions etc.

E. *Sight:* Creating a visually pleasing space is essential but it is not the only element, eye-catching installations, such as digital signs and digital menu boards instead of printed ones also play a very important role. Personalized promotions and menus targeted for restaurants/hotels draw in more regular customers.

F. *Taste:* Taste is the most critical element in a restaurant's success. Taste and smell become the most important sense when eating, smell. The combination both enable the customer to experience the real flavour of the food and without this, no dining experience could be complete.

CONCLUSION

With well designed HCI applications the gap between the user and the computer has considerably reduced, thereby reducing the time customers have to spend in order to wait for its food delivery and has also improved the efficiency to have satisfied and happy customers. HCI has also lowered the labour cost as most of the tasks are not done manually and does not need human labour. The paperwork has also decreased as food ordering and payments are done on kiosks thereby the hotels do not have to maintain a register, rather everything will be saved in the computer for future purpose. The customer can order and pay from their own devices safely and at their convenience and pace. Through HCI the commercial hotels and restaurants are becoming sustainable while saving labour, time and money.

REFERENCES

Alper, A. (2020). AI: The Future of Food   Service Technology. Medium.

Artificial Intelligence AI in restaurant business – benefits, Possibilities & Future. Aglowid IT Solutions.(2021).

Chinthammit, Winyu ,D., Henry , R., Jun. (2014). HCI in food product innovation. Conference on Human Factors in Computing Systems - Proceedings. 10.1145/2559206.2559213.

Commerial Kitchen Technology: The equipment you need for your restaurant. TouchBistro. (2021).

Schilling, D.(2017, January). The Innovative Field of Human Computer Interaction

EECS at UC Berkeley. Research Area: HCI | EECS at UC Berkeley.

Food and UTRITION open access - researchgate.net.Aguilar/publication/333647889_Interactions_between_Human_Computer_and_Food/links/5cf9535292851c874c5421ec/Interactions-between-Human-Computer-and-Food.pdf.

HCI in Food Product Innovation Researchgate

Interactive restaurant table. The Interactive Dining Experience of the Future is Here NOW.

Lee, J.(2018). Interactive Restaurant Table: Touchscreen Tables and the Future of Dining.

Gonçalves dos Santos Aguilar,J., Abdo Aguilar, I.(2019). Interactions between Human, Computer and Food

Wei, J., University of Nevada, Las Vegas(2012). Exploration of Human-Computer Interaction (HCI) Applications in Hospitality Industry.

Dalladay, J.-Simpson(2020). Deep Design: The Next Paradigm of Human-Computer Interaction

Leong, C. (2020). McDonald's kiosk ordering system - A UX case study. Medium.

Back,M., Bee,L., Dunnigan,A., Vaughan J.(2012). Mobile monitoring and control system for a food industry development laboratory.

Sajnani, A., & Patel, N. Food ordering system based on Human Computer Interaction and Machine Learning Techniques. Asian Journal For Convergence In Technology (AJCT) ISSN -2350-1146

SmartSense. The top 11 restaurant innovations. Connected Insights Blog.

Park, S., Kim S., Leifer,L.(2017). Human Chef" to "Computer Chef": Culinary Interactions Framework for Understanding HCI in the Food Industry

Technologies transforming the restaurant industry. www.fastcasual.com. (2018).

Using the five senses to enhance restaurant design. Mood Media Australia.

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