A Study on Smart Classroom Kitchen using Internet of Things

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Abstract. Once upon a time most of the forest was deforested for the purpose of essential wood used in cooking, later on by invention of natural gas, electronic stove, many ways of home cooking came into existence but here in all these a particular traditional home cooking is used for lunch and dinner boxes in their work places, schools. As per children psychology they don't show interest in having non tasty food for their lunch like cool food items and always children prefer having fresh lunch so, the cooking will be done before an hour of lunch and snacks time using with smart kitchen classroom i.e., by IoT. In recent days the core concept of IoT technology has reached into all areas so now it's in cooking also. This system will be user friendly with the guidance of parent and healthy for students who are away from parent and busy scheduled.

Keywords: IoT, Smart classroom kitchen, Smart cooking, Fresh food, User friendly

1. Introduction

The affection and interaction of the parents on their children can't be fulfilled by any others. Due to the competitive weather the children are spending much of the time in their classroom only and at the same time the parent are also not getting enough time to spend with their children because of their busy scheduled time. In the ancient time the food items were produced from natural based resource of agriculture so they were tasty, gave good wealthy health and long standing food items but in recent days the involvement of pesticides and genetics based development of food like vegetables, fruits, graces etc are showing the results of pesticides and these are resulting in global warming in the all other developed countries. The daily need of attending school and preparing of packed lunch box, snacks box done in the morning time for school by the parent results in, change in taste of the food items by this the children don't show interest and will not be satisfied with their box food items as it will be cool down and few snacks items do change their tasty as they were prepared in the early morning. And the prepared box is always stored for many hours in a box with closely packed lid. From some research surveys the hot food items kept in the plastic box effects the health due to the chemical reaction of hot food and plastic and hot Tiffin boxes gets melt with the food items so this will be the most dangerous to any human especially for the child age people it's not preferable.

The current working trends of latest technological gadgets are been everyone's part of life style. The interlinking of latest gadgets and latest telecommunication i.e., 3G, 4G and high connectivity of Wi-Fi with support of Cloud storage and people generally are preferring this and applying in their lifestyle so, by utilizing these smart system people can convert their kitchen into smart kitchen with IoT (Internet of Things). In present days IoT has converted the kitchen into smarter way with detecting the smoke, carbon monoxide, leakage of gas, identifying temperature, humidity by giving sound warning alarm and voice message with automatic online order(already less stock at kitchen) and supply of required grocery with the support of BAR code to save the trip of visiting store points(shops). Consider and identify these entire IoT based smart

kitchen to applicable in the smart class room kitchen in turn of providing tasty and fresh diet for the children by the involvement of IoT

2. Review Literature

Structuring Your Paper

According to forbes [1] described that we can connect the all device in our homes those are lights, cell phones, coffee makers, baby monitors, TV's, Computer even beds but why not the kitchen one who loves food but dislike cooking to those the IoT will help to make them love cooking as it is automatic machine done work. This connected kitchen automates and standardizes many kitchens in the restaurant process in commercial kitchen [2]. Issues like change in temperature identification, alert when equipment working get failure.

Rita Dass has discussed regarding the artificial intelligence with IoT form new waves of kitchen with sensors that know when the stove has been left on to forks that remind us to slow down and saver each bite. There are some devices with sensors which let know the consumers to manage grocery lists using of barcodes be- fore them complete they are **Neo** and **Eggminder** keep track of what you have. These are the examples of scanning barcodes, gadgets like **Amazon Dash** and **Hiku** they also accept voice commands and even place grocery delivery orders to save you a trip to the store. Devices like **Kepler** and **Birdi** helps to keep an eye on things and alert us by giving alarm or voice message kepler identifies the naturals gas and carbon monoxide and birdi monitor if any leakage of smoke carbon monoxide, pollen and change in temperature and humidity. **EveryCook** is device which cook on its own it needs to be connected with internet select the recipe from online and insert the ingredients into it. It is a chef-in-the-box as a part food processor, pressure cooker and robot. **Mellow** is a remote cooking device for steam way of cooking in which food is placed in vacuum-sealed plastic bags and you can use the mobile app to adjust settings and timers so your meal will be ready the moment you require [3].

The above authors discussed about the smart ways of cooking with various smart appliances in kitchen. Here in this study we are incorporating the smart kitchen in- to a classroom to make a smart classroom kitchen

3. Purpose of the Study

Need of the Study

Education is defined as gaining of knowledge with better living styles, in the modernization era the present education systems are quite different only giving preference to reading, writing, arithmetic and parents, students are struck and are within the circle of education curriculum and school activities only, but as per Ravinder nath Tagore, many Philosophers and experts opinions is that every student need not to educated within the four walls of a rooms and within the school campus but student need to educated doing by learning with nature within the student entire life.

In recent days by the effects of Globalization, in the competitive world parents are busy with their employment schedule and the students are joined into schools and hostels far away from home like long distance home, other village and to other nations so by this students don't

have minimum knowledge on how to cook and even basic knowledge of their family traditional style food, more over few of the student are settled as with high profile of professional designation job through education qualification but they are treated as illiteracy people with the lack of knowledge in cooking.

The main aim of new education policy 2020 as per Rangarajan Committee is to move to school without school bags, no lunch box. The sports are being treated as basic subject instead of treating them as extra curriculum activities because to develop student's physical and mental strength and to build a healthy Nation. Same here the hotel management course is also a part of educational system but not a mandatory one as basic subjects, but in the time of ancient it was mandatory in the Gurukulam. The kitchen of every home is in a different tradition and a continuous process with various taste and food habits. This culture must be applicable and needful in the educational system for the students to maintain good healthy while they are in studying/ staying at school. From the above said all information to consider and need to study that the student need to educate with the basic knowledge of home traditional cooking and it is treated as part of his/her education with the support of latest Gadgets and technology by this way it create a platform to smart class room kitchen using of loT and involvement of parents. A prefilled copyright form will be provided by volume editors. Please send your signed copyright form to volume editors as a scanned PDF. One author may sign on behalf of all of the other authors of a particular paper. In this case, the author signs for and accepts responsibility for releasing this material on behalf of any and all co-authors. Digital signatures are not acceptable

4. Research Methodology

Implementation of Smart Classroom Kitchen

Due the present pandemic situation of covid19 virus all children are in their home which became a mini schools, after this pandemic situation the school can be turned as mini home keeping in view of children health by having food, snacks and liquids this can be possible through the involvement of Internet of Things. Now-a-days every parents is having a minimum knowledge on how to use latest electronic gadgets and same time the educational institution are making it as mandatory to utilize the facilities of internet connectivity in the institution by the inter- link and involvement of both parents and institution through establishment of a framed online network that it can be possibility to create a new style of smart kitchen class room.

As per existing and coming new educational policy 2020 guideline its mandatory to maintain each class room and some specific area building so that in this building students can avail these minimum facilities that are Student Personal Bench, Student Desk, Student storage desk, Student dinning room/area, Students play field, Student Indore/outdoor games faculties, Drinking water, Toilets, Common lab, Common library etc But with the involvement of latest technology the school institution are using and adopted to PROJECTER based education system and multimedia board(instead of block board) and the following can be implemented and adopted they are online student attendance, online progress cards, online to- day schedule board, online student GPS location identification track, some special educational institution are also providing online education with the support of abroad educational institution these all are in the favor of students so that they get high quality of education and this can be possible with the involvement Internet of Things effects. Now on considering all these technology of IoT we can

establishment and implement the processes of smart kitchen classroom in the education institution.

The following are requirements of smart classroom kitchen they are

Student E ID for Smart Classroom Kitchen:

The design of E-ID card is a unique smart ID card with the student and parent de- tails of their food habits it can be accessible by the student directly, parent and institutional care taker with the involvement of IoT. Moreover in this process monitoring of the smart classroom kitchen can be done by anyone i.e., student parent institutional in-charge management, care taker. So on using this system the E-ID card has the all information stored in the institutional cloud storage like the traditional food taste of the student's family, likes food and dislikes food, healthy required food, interested food, etc along with the previous and family opinions are stored in the student E-ID card. Using this process the best, tasty, hot and healthy food is reached to the student even during their schooling hours.

Making Snacks and drink at Smart Classroom Kitchen:

By the involvement of student E smart kitchen ID and IoT technology the smart classroom kitchen can be handle parents from their own place like homes, work- place and make them snacks and give drinks as per the student needed taste. In this process the student gets more than six various varieties of snacks daily with tasty hot, fresh item similar to homemade food. Preparing snacks and energy boosting drinks are framed by the inventory design machinery support which are automatically working by the involvement of IoT technology with the required amount only, items i.e., cornflakes, multivitamin cereals, etc using their E-ID cards. Example: Egg Omlet, seasonal food items (corn, sweet corn, ground nut, sweet potato, chips) Fruits seasonal, Fried items.

Drinks the likes milk, badam milk, lassi, with few energy booster like boost, horlicks, complain etc are taken from the machine which is pre programmed as per the each student requirements.

Making Lunch at Smart Classroom Kitchen:

The preparation of lunch is not as simple as snacks and drinks, here in this system no of pre programmed devices, algorithms, sensors and etc are involved and this work only with the support of institution care taker and student along with the instructions received from the parents by IoT. Here some extra instrument required as per student need like smart micro oven, smart kettle, smart pressure cookers, smart everycook pressure cookers, smart Roti maker etc these all smart gadgets inter connected with the student E-ID and operated in proper utilization of parent instructions monitoring by the institution care taker.

Process involved for lunch making at Smart Classroom Kitchen:

Firstly the parent give suggestion and instruction about the student interest and food habits every day to the educational institution through the Student Smart E ID and sometimes students also demands change the daily menu with opinions of parents and these instructions are directly stored into the cloud through sensor de- vices and the algorithm keeps on passing

required instruction to the institution care taker and parent. The process of lunch preparation will be started at smart class- room kitchen as per the given commands of parents.

Smart Roti and Rice Preparation

In the daily menu roti is one of the items which are of high protein lunch. In the preparation of the smart roti the involvement of care taker student and the instruction from parent are followed, raw material like wheat flour, salt, oil is taken from the smart kitchen storage as per the instruction flour is mixed with a mixer a dove is prepared and placed on smart roti maker using student E-ID. Roti is ready with- in a 5minutes, similarly the rice is washed and placed on smart pressure cooker within 10minutes it is ready these all are connected with internet and works on hands, the quality of raw materials are taken through a inventory machinery predefined as per the parent instructions in their student E-ID.

Smart Curry Preparation

The raw material is taken from the smart kitchen storage with quantity preloaded in student E-ID. A Smart everycook pressure cooker is used in which all material is placed as per instruction of parent preloaded in student ID display on the cooking monitor display. The everycook automatically stir the curry and cook with the help of IoT technology connected with Student E-ID

Fig.1. Smart lunch making instrument

Involvement of IoT Technology in the System

As per the design of student E-ID the smart classroom kitchen developed with the groups of sensors and pre programmed inventory machinery. The monitoring sensor devices store the information of grocery for lunch, snacks and drinks in the cloud storage and either by alert or by message when required to the parent and care taker indicating the low level of items. Moreover few devices order online if the grocery items levels are low with the support of e-commerce interlinked with student E-ID payable amount is deducted through student E-ID without any involvement of parent. This can be implemented using an algorithm with predefined instructions to automatically activate and forward the information to parent/student and school management. The feedback is also received to take necessary future action.

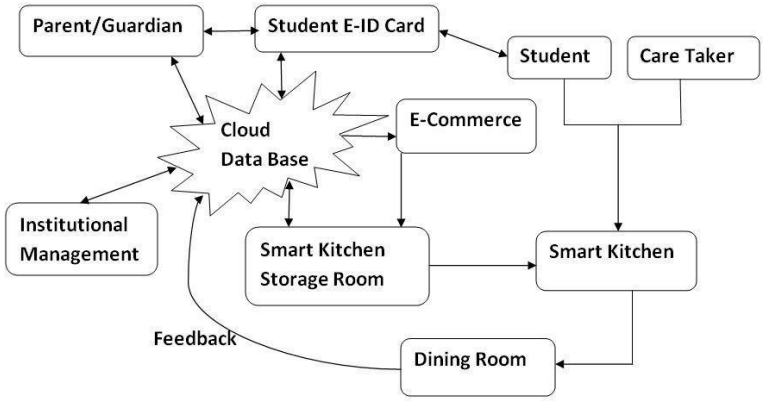

Fig.2. Design structure of smart class room kitchen

Conclusion

As in the past in every home, the kitchen is like the heart of human body, but now it is modified as brain of the human body that is by the involvement of IoT and latest technologies into it. From the earlier stage to till now people are continuing the process of traditional system believing kitchen and the heart only, so people are preferring for schooling children the old style of home making lunch box, snacks box which is non tasty, non healthy food in their lunch and snacks boxes. But now by utilizing of IoT and addicted to the latest gadgets the kitchen is already converted as smart kitchen. By the use and involvement of Artificial Intelligence algorithms, remote sensors, Internet of Things, Cloud storage and specially designed pre programmed system on providing schooling children a tasty and healthy food with in the low cost. Here this shall be user friendly for the parents at the same time children interested food will also be available at school. Finally the children feel good and more interaction with the parents during the schooling time

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