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S.H.A.K.T.I. (System for Home Automated Kitchen Technology Integrated)

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*Abstract***—** On an Average, Indian Spend about 13 hours a Week cooking Food. This is a Product which will be engineered in the near Future by us. The Idea is to Engineer an Automated System to Save Time and to make the Consumer Healthy. Apart from cooking food some of the Features that we would like to highlight are: Temperature Controlled Food Repository, Cutting and Cleaning Vegetables before Cooking without Human Intervention, Weighs the food to cook a Balanced and Healthy Recipes, Has a Separate storage for Spices and Condiments to make Food Taste more desirable, The Online Mobile application which will ask," What would you like to have for Breakfast/Lunch/Brunch/Supper/Dinner? ", Will Recommend the Dishes and Recipes as per the Availability of Food. This is Artificially Intelligent Machine which will also notify you about the Food being running out and Create Recommendations for the Vegetables, Fruits, Spices etc. It reduces the chances of Food Being Unhealthy and Increases the Quality of the food. It will indirectly improve the Health and Life Expectancy Significantly.

***Keywords*—Artificial Intelligence, Automated System, Health, Recommendations of Recipes, Temperature Controlled Repository**

I. INTRODUCTION

The Global average time for cooking food is 6.5 Hours/Week. Indians spent about 13 Hours/Week Cooking Food. These Systems are Still under Progress. As this World Progresses we need to find a Solution to Save Time for Productivity and Improve Health [6]. This paper might enable us to establish the Visualization like how the Future looks like.

II. HEADINGS

System for Home Automated Kitchen Technology Integrated (A.K.A. S.H.A.K.T.I) is an Automated System Using Artificial Intelligence.

III. MATERIAL AND METHOD

3.1.Storage and Weighing:

Food needs to be in a Stored in a Desired Environment where the Temperature increases the Shelf life of an vegetable or Fruit [14][16]. As the Food is Being Selected by the User using Online Web Application [12] the Food being selected by the user as a Vegetable the S.H.A.K.T.I. identifies the Vegetable [2][9] and is being transferred into the Weighing Section using Incline Modular Belt Conveyor as it is Robust and grips Vegetable very well [13].

In this Section we can use Miniature Load Cells which has the Accurate Precision. We may use the 40 Kg Load Cell [8]. The analog weight is converted into Digital form and later Propagated towards the Microcontroller and later Calibrated by the

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Microcontroller for Further Operations. This Approach may help us to create an Accurate Weigh Scale Machine for Quality Processes [8].

Or we may create an Algorithm which will detect the Vegetable which is small in Size or Use that one vegetable which creates Overload and Cut it into Quarters.

When it comes to Cabbage, Cauliflower, Broccoli or any Big Vegetable we may make Quarters of it and use it further.

3.2. Washing

Before coking food, it is very important to clean or wash the Vegetable and Rice. Hence after weighing the vegetable or rice the next step is to wash the raw vegetable in perfect manner.

To wash the raw vegetable the machine we might use warm water (33-35 ‘C) because all most 70-75% of bacteria will be killed by the warm water.

3.2.1. To wash vegetable like coriander, Shepherd, etc. our machine will use the cylindrical vessel (Diameter = 60cm, Height=30cm).

3.2.2. The vegetable like cabbage, carrot, cucumber, etc. are also use the same Vessel with Robotic arm.

3.2.3. To clean the small Residues in the Food like Rice or Pulses our machine will use Tiny hole bowl shape vessel to Drain the Unwanted water.

3.3. Peeling & Cutting

After washing the vegetables, peeling and cutting section will get initialize. In peeling part as name says removal of vegetables skin will take's place and in cutting part the vegetables will get cut according to selection.

3.3.1. Construction of peeling block:-

This block has part like a rotating cylinder placed on a high rpm DC motor, inner surface of cylinder is coated with fine sand, it has inlet and outlet pipes for water and an opening to collect the residue of the vegetable [3]. Abrasive Foam are also one Effective method to peel the Vegetables due its Flexibility [3].

3.3.2. Working of peeling block:-

Washed vegetables from washer is supply to a peeler , peeling cylinder then gets turn on, due to fraction and sand coting vegetables gets peeled ,there is continuous flow of water from inlet pipe to clean the vegetables in peeling process and outlet pipe is use to drain waste water. Peeled vegetables is then supplied to a cutting section for further process. For tough skinned vegetables we may use the Thermal Peeling or the Chemical Peeling process [3]. The Residues will be Transfers into one Container which will notify the User to empty it.

3.3.3. Construction of cutting block:-

This section has two selection of cutting.

3.3.3.1.-Fine Cut

3.3.3.2.-Slice Cut

The Fine cut blades are arranged in Solenoid Structure and for Slice cut blades are arrange on a metallic disk.

In both the Cutting Methods we use Motor.

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A Mechanical relay is use to control flow of vegetables

3.4. Cooking Methodology:

After the Weighing Process now, the Vegetable is now ready to be cooked. We Have Considered Some of the Parameters to Understand the Characteristics to create an Optimal Cooking Methodology [6].

Various methods of cooking involves:

3.4.1..Baking.

3.4.2. Frying.

- 3.4.2.1. Deep Fry.
- 3.4.2.2. Stir Fry.
- 3.4.2.3. Pan Fry.

3.4.3. Sautéing.
3.4.4. Roast.
3.4.5. Grill.
3.4.6. Steam.
3.4.7. Poaching.
3.4.8. Simmering.
3.4.9. Broiling.
3.4.10. Blanching.
3.4.11. Braising.
3.4.12. Stewing.

Even though we understand the Requirement of the Cooking methodology to make our Mouth watery Craving for a Delicious Cuisine yet we understand the Nutritional Requirement. However the Data on the Effect of Cooking on Nutritional Value are Still Incomplete. In fact the Literature data on Nutritional Value of Food are Incomplete as we miss out Various Parameters [6].

3.5. Artificial Intelligence Automation:

In this Automated System will be apart from the Conventional Cooking method as we will be using Induction coil [10]. The Reason of Choosing this Heating methods are:

- 3.5.1. Induction Coil transfers heat to the Induction Based Utensil Fast and not to the Surrounding Air. Allowing for Safe and Cool Operation [10].
- 3.5.2. As Electricity is feasible source of energy. As we need not require to wait for the Gas Delivery or Extra Effort to Register.
- 3.5.3. As this Device will have Implementation of Electronic sensors which might generate Static electric Charges and the Gasoline is Prone to Explosion.

The Procedure mentioned below may change, depending as per the Requirement, Mechanical Structure and the Metrics. In Various Scenarios of cooking we need Different Utensils to perform. We may use a Circular Disc Having Various Utensils like Pan, Pots, Grilling Pan etc [7].

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It will have a Circular Disc which will have bowls of which 3 Vegetable Section, 2 Onion, Ginger and Garlic Section, 5 Small sections for all the Spices and Condiments and 2 Nozzle of Oil and Water [11]. The System will be programed to have a Step wise approach for activating a certain bowl in the Process of Cooking [7].

The System will have Separate Section for Chapati. After the preparation of Dough we elongate the dough into a long Cylinder which will be cut into several small Cylinder. These Small Cylinder are used to Bake Chapati.

3.6. Serving:

With the Help of Robotics the Automated System will serve the Food into the Dishes that you want to be served in [17].

3.7. Food and Safety:

In order to survive and Reproduce the Bacteria needs Nutrients, Moisture, pH, Temperature and Time [5].
Bacteria Requires Glucose, Amino Acid, Vitamins and Minerals to Survive. The Moisture also plays an important role like the Bacteria Grows in a decent moisture Environment. Bacteria does not grow Below 4.6 pH Level. Beyond a Certain Temperature the Bacteria doesn't Grows.
Bacteria are spread into food by Animals, Soil, Water and Human [5].
As we aim to Create this Automated System Taking theses parameters into Consideration we may hypothesize that the Food Cooked will be Hygienic.
The Food Container, Spice Container, Flour Container will be the Plastic which will have Very Negligible Impact on the Quality of the Food.

3.8. Features:

Apart from Conventional Cooking we Plan to Design S.H.A.K.T.I. to have an Online Application which will notify asking Query, "What Would you like to have?" It Will Recommend Food Dishes as per the Food Available in the Repository. Incase if we run out of Food the Online Application will help the User to Online Purchase the Vegetable, Spices, Oil etc [12] .

TABLE 1
COMPARISON BETWEEN CONVENTIONAL METHOD AND S.H.A.K.T.I.

Sr. No.	Parameter	Conventional Cooking Method	S.H.A.K.T.I.
01.	Time Consumption	Indian Spend about 13 Hours/Week.	People may Rely Upon the Machine for cooking their food and use their Time more Productively.
02.	Health	If we Go in a Restaurant that Offers food. There high risk of it being Unhealthy.	As the Food is being cooked at home with the vegetables we are familiar with and the S.H.A.K.T.I. is programmed to use limited amount of Spices and Oil which will Definitely positively Impact Peoples Health.
03.	Maid	In case if you are a Working Professional you might consider Hiring a Maid which will cook food for you. But there Could be Risk Involved too like Hygiene, Personal Intentions, Holiday etc.	As S.H.A.K.T.I is an Automated System it will work for you 8,760 hours/Year. No Holidays, No Hygiene Issues etc.

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IV. CONCLUSION

Artificial Intelligence to Cognitive Thinking Intelligence, a new pathway to the science of Artificial Intelligence that can emulate human cognitive abilities even if not 100% [1] .S.H.A.K.T.I. will enhance the Quality of Life which will Heavily Positively Impact on Humans Time, Effort and Health [5].

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