

# Research on Smart Kitchen System

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## Abstract

Since the 21st century, with the maturity of the Internet, Internet of Things, artificial intelligence, 5G and other technologies, intelligence has become a global consensus, and the construction of smart cities is also the general trend. As the saying goes, "Without a stove, you can't make a kitchen, and without a kitchen, you can't make a home." The kitchen is the heart of every family, and it is also the key residential application of smart homes. The kitchen is also the peripheral nerve of the gas pipe network. It is the link between the family and the pipe network. It also needs to be safe. Compared with traditional household appliances or kitchen appliance brands, gas companies have the inherent advantage of combining kitchen applications with gas applications, and even have the conditions to combine with smart city livelihood applications, which is more suitable for the development trend of smart kitchens.

## Keywords

Artificial Intelligence; 5G; IoT; Smart City; Smart Kitchen.

## 1. Introduction

At present, the smart kitchen, including the entire smart home industry, is still in its infancy. As can be seen from the products on the market, most of the products currently marked as smart home appliances only add the function of remote control of mobile phone APP on the basis of traditional home appliances, and directly transplant the buttons on the previous home appliances to the mobile phone. This is true even for smart kitchen appliances such as smart ovens, smart range hoods, smart stoves, and more. Simple linkage between kitchen appliances such as hoods and stoves has been realized. From a technical point of view, the smart home appliances mentioned above only add data transmission modules such as Wifi, Bluetooth, Zigbee, etc. on the basis of the original, plus a supporting APP<sup>[1]</sup>. In addition, there are many manufacturers developing smart kitchen appliances on the market, and the standards and protocols of each manufacturer are not uniform, which brings difficulties to the subsequent product integration and interconnection.

## 2. Recent Developments

IoT is an extension of the current communication network and the Internet. From the perspective of architecture, IoT can be divided into the perception layer, the network layer and the application layer, forming a huge industrial chain system. All levels play a very important role in the development of IoT industry. The perception layer is the basic physical network for the IoT system to perceive, identify and collect information from the real world; The network layer is an important supporting network cluster for realizing seamless connection and all-round coverage of the IoT. It undertakes the mission of transmitting the data and information identified and collected by the perception layer to the application layer at a high speed, low loss, safely and reliably, and at the same time, it can well resist external interference and illegal intrusion; The main function of the application layer is to carry various applications and

promote the transformation of their achievements<sup>[2]</sup>. The goal of the next stage of the development of the IoT in China is to improve the IoT industrial chain, focus on the development of hardware, software, system integration, operation and service and other core areas closely related to the IoT industrial chain, and strive to create sensor nodes, network access, data transmission, operating system, system integration and other important products and solutions, so as to achieve breakthroughs in key links of the industrial chain.

Smart kitchen is a combination of Internet of Things, AI and data fusion technology. It can automatically control and manage household appliances, monitor and alarm the safety of the home kitchen environment, and provide residents with a safe, comfortable, efficient and convenient learning, living and working environment. The smart kitchen system connects various information related equipment, appliances and home devices in the home kitchen through wireless means, and carries out centralized or remote monitoring and management to maintain the safety and coordination of the kitchen environment. Compared with ordinary kitchens, smart kitchens not only have the traditional kitchen functions to provide an efficient and safe living environment, but also upgrade a passive and static environment to a considerate life helper with a certain degree of intelligent assistance ability to further optimize people's quality of life. Many countries have proposed different smart kitchen solutions, for example, the smart kitchen systems of the early Singapore model include: security alarm, visual intercom Intelligent meter reading, intelligent monitoring, kitchen electricity control, broadband network access, etc. Today's smart kitchen system has more superior and complex configurations. For example, new functions such as online payment, remote alarm and emergency help are developed and designed according to the development of the society and the growing demand of people.

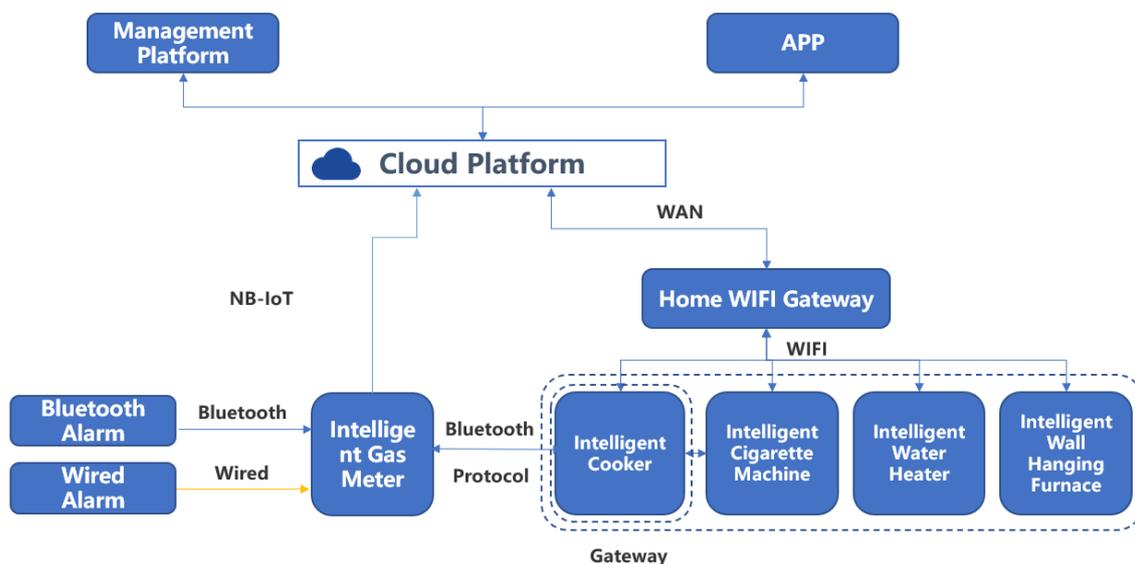


Fig. 1 Platform Architecture of Intelligent Kitchen

### 3. Significance

Although the smart kitchen system has developed to a certain extent, and corresponding products have begun to appear in the market, the overall development is not optimistic, especially the lack of unified standards and authoritative products has seriously affected the development of intelligent kitchen appliances<sup>[3]</sup>. With the improvement of science and technology, the development of economy, and the improvement of people's material living

standards, the requirements for the home environment are also getting higher and higher. As an important part of home intelligence, the smart kitchen system is becoming more and more important.

The smart kitchen controller can provide an intelligent control scheme for the household system, making the household's control more convenient and efficient, and saving unnecessary energy consumption for the household's daily activities. Moreover, in this green and environment-friendly world, we can intelligently control all kinds of kitchen equipment and environment for residents, and monitor the equipment safety and environmental safety of the kitchen in real time, so that residents can live in peace of mind. At the same time, the smart kitchen system can adjust the scheme according to the different needs of residents, so as to fully realize the system as long as users want<sup>[4]</sup>.



Fig. 2 Future Smart Kitchen

#### 4. Prospect

The ultimate goal of smart kitchen is to realize the interconnection between devices and the connection between devices and cloud platform, realize the visualization of data, create a smart kitchen ecology, and greatly improve the user experience of residents cooking in the kitchen. In the future, more intelligent kitchen appliances will realize interactive connection with cloud based big data platform through software control and transmission module connection, greatly improving people's operation mode in the kitchen.

#### References

- [1] Jagtap N , Kedar S , Udhanshiv A . Development of Smart Kitchen System using RFID. 2014.
- [2] Ceccacci, S. , R. Menghi , and M. Germani . "Example of a New Smart Kitchen Model for Energy Efficiency and Usability." 2015.
- [3] Yasar Ahamed S Raghulram V Balaji V R. SMART KITCHEN WITH INVENTORY MONITORING AND MANAGEMENT USING IoT. 2018.
- [4] Ehrlich N C , Ehrlich C C , Stump J . SMART KITCHEN MONITORING SYSTEM AND METHODS:, US20210256831A1[P]. 2021.