

# INVENTION DISCLOSURE

## 1. Invention Title.

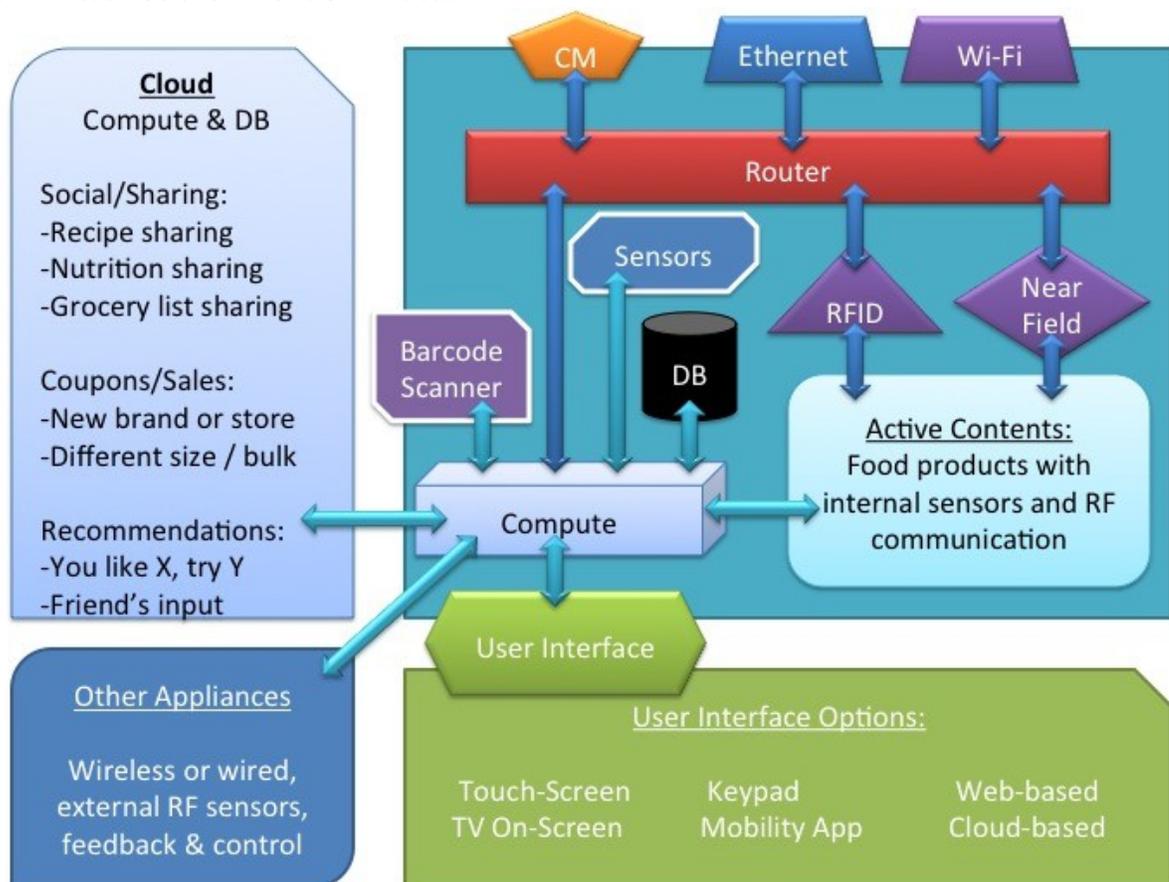
### eFridge: The smart kitchen's hub

## 2. Invention Summary.

This invention describes a “smart” refrigerator (or “eFridge”) that acts as the hub of a smart kitchen eco-system, a method for providing information to the eFridge via “smart” products and other means, and a user interface.

## 3. Invention Description.

### a. Describe the invention in detail.



We are proposing a “Smart” refrigerator and “Smart” food products that interact with each other and other devices in a “Smart” appliance ecosystem in the following key ways:

- Ordering Process
  - Individual food items can be equipped with sensors to detect how full they are. The items then signal their levels to the eFridge wirelessly. This could be done with RFID, Near Field, or some other communication protocol.
    - Products not inside the eFridge can communicate with the eFridge via remote relays placed in cabinets, other refrigerators, a storage

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freezer, etc. These relays may communicate with the eFridge via Ethernet, Wi-Fi, or some other communication protocol.

- Food items not able to communicate directly with the eFridge can be scanned with a built in barcode/QR-Code scanner or entered into inventory manually through the User Interface.
- The eFridge keeps track of food levels, either locally, in the cloud, or some combination of both.
- The eFridge can be programmed to automatically order certain products when their levels cross a set threshold.
- The eFridge can be programmed to send a user alert (SMS, email, on-screen, audible, etc.) when certain products' levels cross a set threshold.
- The eFridge can be programmed to generate a shopping list on demand, which considers current product levels, planned meals, or other criteria.
- Expiration Management
  - Individual food items with appropriate tagging information communicate their expiration date to the eFridge; for food items that are not appropriately tagged, the information can be entered by the user.
  - Individual food items could also be equipped with sensors to detect their freshness; this information is communicated to the eFridge.
  - The eFridge can be equipped with internal sensors that can further monitor product freshness.
  - The eFridge tracks product expiration dates and freshness and can be programmed to auto-order, user-alert, etc. based on proximity to expiration date, freshness, and/or other means.
- Recipe Interaction
  - The eFridge is aware of all food on hand. The eFridge is Internet connected and can have support from a cloud based application. This allows the eFridge to provide suggested recipes based on food currently on hand.
  - The eFridge can also provide recipe's for which most of the ingredients are on hand but some need to be purchased. This would result in a shopping list or an auto order, and a recipe.
  - The eFridge can reverse this process as well, in this case the customer selects a recipe or a list of recipes and the eFridge provides a shopping list (or auto-order) that will provide all of the needed ingredients (taking into account food already on hand).
  - This process can be enhanced with a cloud based application that provides meal planning assistance, etc.
  - The eFridge can also track leftovers in reusable "Smart" containers marked with a number of portions leftover from an eFridge provided recipe.
  - The eFridge can suggest recipes based upon food nearing expiration to prevent food waste. This function can be combined with any of the above recipe functions.
- Nutrition Tracking
  - Because the eFridge is aware of all food products entering and leaving the kitchen, it can provide household level nutrition tracking.

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- This can be enhanced with dietary restrictions (not allowing the order of certain foods).
- The eFridge could potentially be tied into your health care provider to download restrictions and/or upload history.

In all of these cases, the eFridge could be equipped with one or more methods for customers to interact with it:

- Touch-screen
  - Built into the eFridge
- Keypad
  - Built into the eFridge
- Web-based
  - A web server built into the eFridge that allows it to be accessed from the local network and/or remotely from the Internet
- TV On-Screen
  - A tie-in to the customer's EBIF/Tru2Way capable STB or SmartTV allows on screen interaction with the eFridge
- Mobility Application
  - Access the eFridge from your smart phone or tablet
- Cloud-Based
  - A cloud based interface to allow remote access and perhaps access to advanced features.

Any/all of these User Interfaces would provide basic control of the eFridge, and through it control of other "smart" appliances. Additionally, some or all of these UIs could provide access to advanced features, such as:

- Social/Sharing
  - Recipe sharing
  - Nutrition sharing
  - Grocery list sharing
  - This is inclusive of all posting (manual, pre-programmed, or automatic) to social media websites such as Facebook and Twitter, as well as a possible eFridge specific social media platform or forum
- Coupons/Sales
  - The eFridge manufacturer, service provider, retailer or MSO can provide coupons and sale notifications directly to the customer
  - Based on history, could offer alternative brands, retailers, sizes, etc.
- Recommendations
  - "You liked X, try Y"
  - Recommendations can come from social media friends/contacts, or any of the folks listed above under coupons and sales, etc.

- b. Why was the invention developed? What problem(s) does the invention solve? How is it better?**

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It solves the problems of keeping appropriate fresh food in constant supply, providing assistance with recipe creation and shopping list creation, home inventory management, and nutritional assistance. It also brings social networking into the kitchen. It could also provide cost savings to the consumer by minimizing waste. This eFridge is better than current refrigerators in that it is an active and connected device that can be used as the hub of a smart kitchen, rather than just keep things cool.

### **c. Briefly outline the potential commercial value and customers of the invention.**

We have identified four potential business models that could be built around the eFridge:

- An “Amazon Kindle” style model where a retailer provides the eFridge at a low cost as a way to ensure that customers order food products through the retailer. By providing an eFridge tied directly to their cloud based ordering system at or below cost, the retailer creates a captive audience of consumers.
- The second model is one where multiple manufacturers offer the eFridge, along with a host of “Apps” that allow it to be tied into multiple retailers of the customer’s choice.
- The third model would serve as an add-on to one of the above models in the form of a medical health and diet tracking service. There could be a way for doctors to push dietary restrictions down to customers or for customers to share their diet information directly with healthcare professionals.
- Finally, commercial kitchens and businesses in the food services industry could simplify inventory management and reduce waste using an eFridge system. Restaurants, grocery stores, and food producers could use a “Just in Time” model facilitated by a more complete and automated food supply tracking system.

In any of the above models (and likely any others that emerge), the customer’s MSO could become an integral “middle man” in the service. With the UI extended to an on-screen guide provided by the EBIF/Tru2Way capable STB or Cable-Ready SmartTV, Internet access provided by the MSO, and potentially cloud servers located within the MSO network as first steps.

#### **4. HOW is this invention different from existing products, processes, systems?**

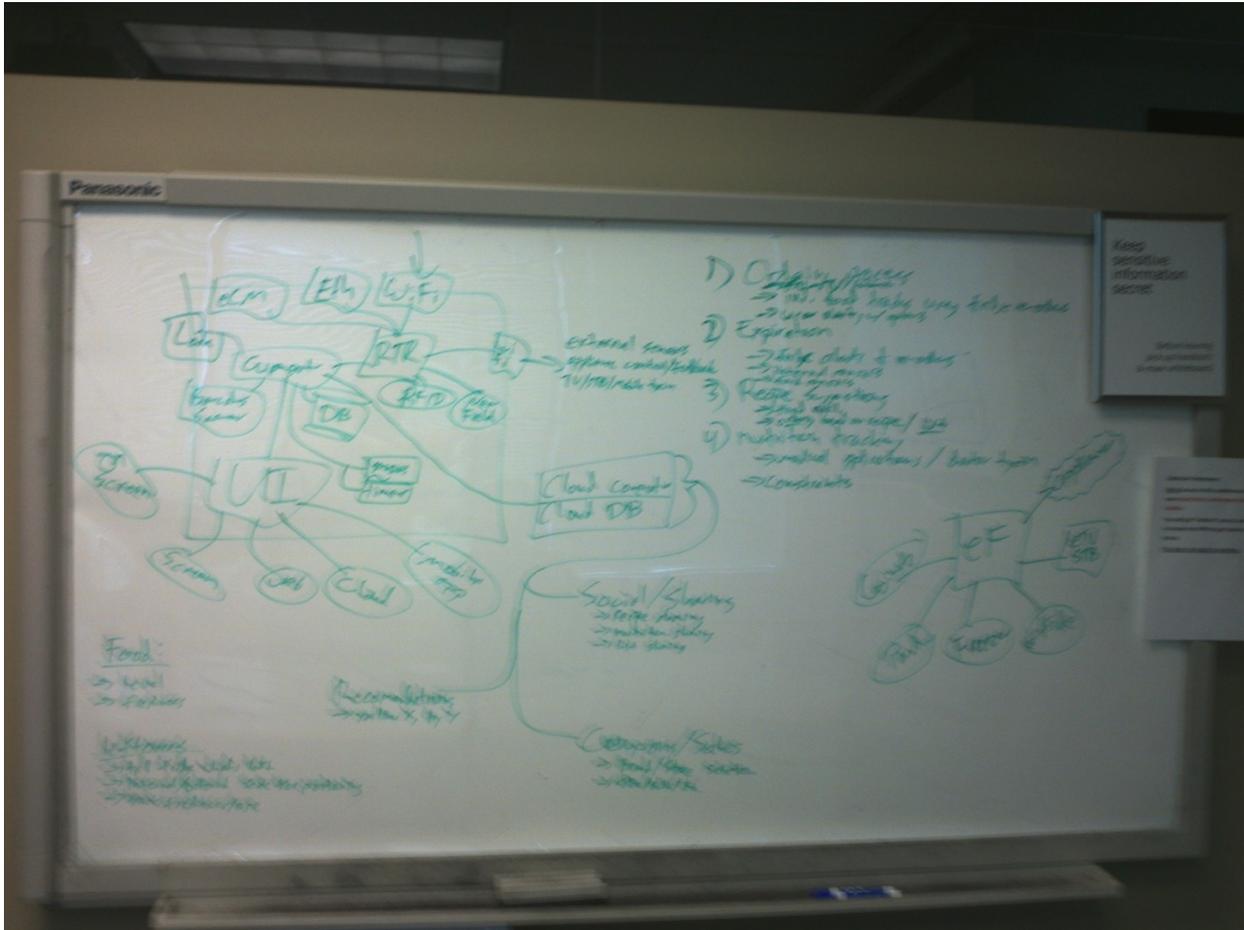
There is not currently an existing system or product that functions in the manner described above. Traditional refrigerators are cold storage devices and people are responsible for inventory control and freshness sensing. The current method leads to ingredient outages and waste.

The eFridge is different from current and proposed products because it creates, and serves as the hub for, a “Smart” appliance and food product management ecosystem. This ecosystem allows food products in multiple storage locations to interact with a plurality of connected devices in the network. The unique ability to interact with all or nearly all of the food in the kitchen enables eFridge the ability to offer services single entity solutions cannot offer.

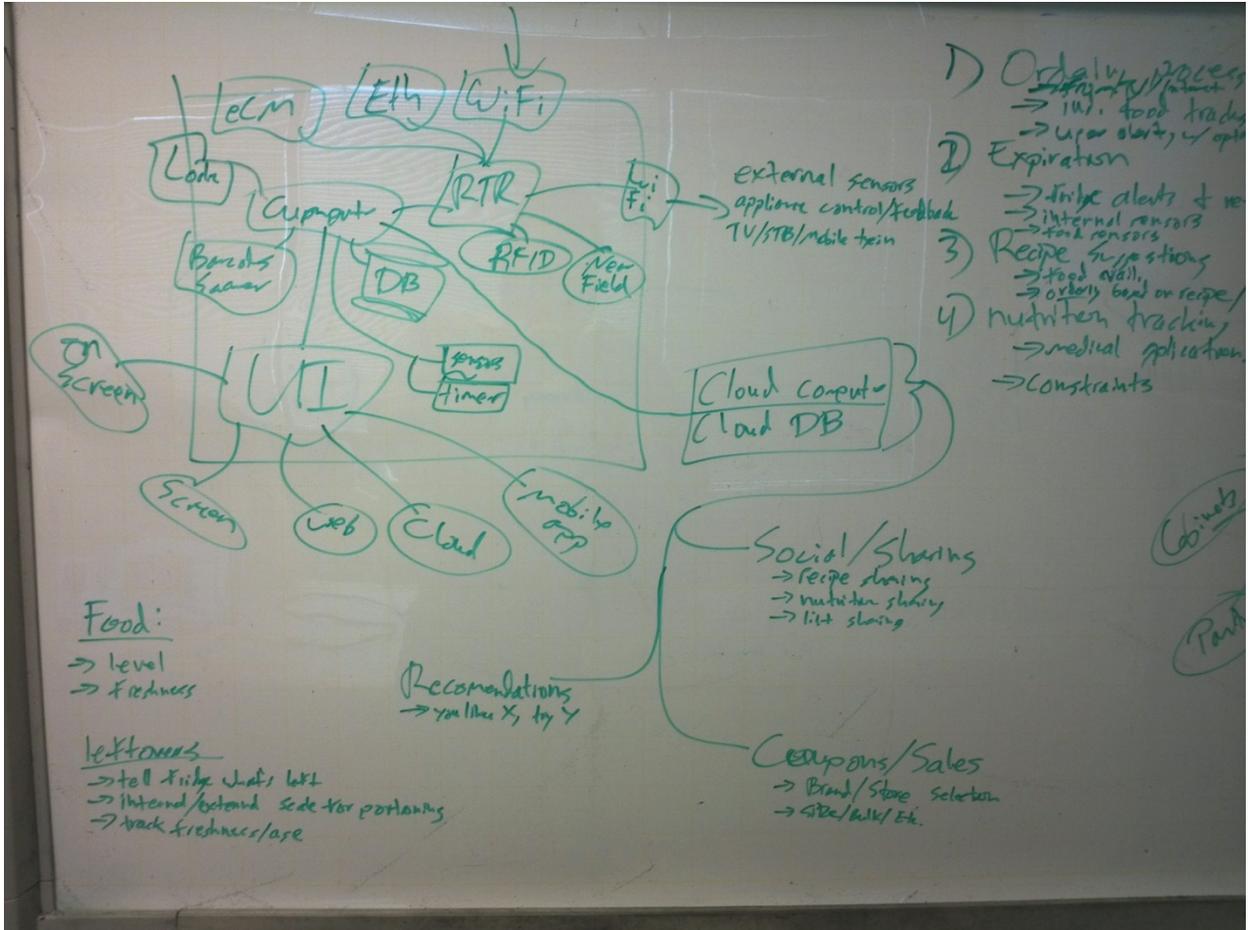
Samsung proposed a refrigerator with RFID capabilities but has not brought the product to market (<http://www.textually.org/textually/archives/2007/01/014575.htm>). Furthermore, the

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solution referenced in the link above is a single refrigerator solution that is not integrated as the hub of a "Smart" kitchen or food storage system as described above in eFridge.



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