

COMPUTER SCIENCE & ENGINEERING

UNIVERSITY OF WASHINGTON

CSEP 510: Human-Computer Interaction

Project Proposal: Cooking Companion

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Abstract

TODAY THERE EXIST A MULTITUDE OF APPLICATIONS FOR SMARTPHONES AND TABLETS DESIGNED TO AID THE AMATEUR CHEF. MOST OF THESE APPLICATIONS FOCUS ON FINDING AND MANAGING RECIPES, OR PROVIDING GENERAL COOKING ADVICE. PERSONALIZING THESE APPLICATIONS TO ONE'S NEEDS IS CUMBERSOME AT BEST, AND NOT POSSIBLE IN MANY CASES. IN *Cooking Companion*, WE PROPOSE A NEXT GENERATION COOKING APPLICATION THAT ELEVATES ITSELF FROM A MERE RECIPE-SEARCH APPLICATION TO A MORE MEANINGFUL KITCHEN HELPER. *Cooking Companion* TURNS ANY SMARTPHONE OR TABLET INTO A COMPANION THAT KNOWS YOU AND YOUR FAMILY, UNDERSTANDS YOUR TASTE, AND EVEN ADJUSTS TO YOUR KITCHEN APPLIANCES. ALTHOUGH COOKING COMPANION CAN BE USED BY ANYONE, IT IS TARGETED TOWARD WORKING ADULTS WHO ARE ENTHUSIASTIC, BUT NOT EXPERT, COOKS. THESE PEOPLE ENJOY EXPERIMENTING WITH RECIPES AND TRYING NEW COOKING TECHNIQUES, BUT LACK THE TIME FOR FORMAL TRAINING. *Cooking Companion* HELPS THEM FIND RECIPES THAT THEY—AND THEIR FAMILIES—LOVE, AND PROVIDES THE CULINARY SUPPORT THEY NEED WITHOUT REQUIRING ANY ADDITIONAL TIME.

1 Analysis of Problem

A quick search for “recipe” on Windows 8 application store returned 698 applications, and Google Play has well over 500 cooking applications for Android. These applications range from very specific (e.g., offering variations for a particular dish, or a particular cuisine) to being reasonably generic. Some applications provide features beyond recipe management. For example, the AllRecipes application allows users to search for recipes after choosing a set of ingredients, allowing a much more useful targeted search for feasible recipes. Most applications allow saving recipes as part of application data that can roam to another PC.



Figure 1. Many recipe apps do not have the ability to integrate easily into our daily lives. Recipe apps should be able to interpret recipes and provide pre-made shopping lists, as seen in this example.

For example, if you were using your iCookbook application on a Windows 8 PC, and you saved your recipe with the application, on a later day, you could walk to a friend's place, sign-in to her PC using the same Microsoft Account and see your recipe in the iCookbook application on that PC. Perhaps the most creative feature that we have observed in this space is the “gesture control”⁶ feature in the Food & Drink application in Windows 8.1. During cooking, you can now easily use gestures (like hand-waves) to move to the next screen of the recipe rather than having to physically touch the screen. Very cool, indeed! However, none of these existing applications have yet lived up to being a complete cooking companion. There are many real life situations where you need specific cooking help that these applications are not able to solve. We discuss some of these in the following section.

⁶ Wahid (2013).



Figure 2. Many recipe apps require touch to interact with the device. *Cooking Companion* seeks to remove this requirement by responding to voice and gesture input.

2 Suggested Improvements

We want to build a kitchen companion that’s personalized. An application that is there for you when you need it. Here are a few examples where our application would help:

- You find a very interesting recipe that’s meant for 10 people; *Cooking Companion* can adjust it for your three-person family.
- You are in the middle of cooking using a recipe when you realized you are missing an ingredient; *Cooking Companion* will help you find a substitute.
- You invite somebody to dinner but don’t know what to make; *Cooking Companion* can help you learn his or her food taste.
- You are making dinner after skiing at Whistler, and need to adjust your recipe for the altitude; *Cooking Companion* does this for you automatically.

The other area where current cooking applications fail miserably is the integration with the other important services. *Cooking Companion* will integrate closely with your grocery-shopping application and store coupon management applications. It will indicate where ingredients can be found so you can assemble your recipes faster, cheaper and smarter.

3 Scenario Walkthrough

- Amy was browsing her *Cooking Companion* application when she found an interesting Indian recipe—Chicken Biryani. She added this to her wish-list and in turn the companion added the ingredients to her “Shared Shopping List”

application. Later, Amy was grocery-shopping, when she saw the list of ingredients. The *Cooking Companion* app also checked the weekend store coupons and suggested best places to buy these ingredients. While shopping, she found one of the ingredients was very expensive. To her advantage, *Cooking Companion* already divided the list into “required” and “good-to-have” ingredients and Amy could avoid an expensive ingredient that is in the “good-to-have” list.

- Tom invited his Mexican colleague Francisco for dinner. Tom doesn't cook Mexican cuisine and is unfamiliar with Francisco's food preferences. Tom's *Cooking Companion* is able to feed from various sources (including public information that Francisco's cooking-companion shares) about Francisco's love for fajita. Tom's *Cooking Companion* was also able to find a fajita recipe that's easy to follow.
- Luis doesn't cook very often. One evening, his wife is out for a meeting and Luis has to cook dinner for the kids. Luckily, his *Cooking Companion* app knows the taste of his family and is quickly able to recommend his best options. Luis picked a Macaroni recipe based on that suggestion and has a very happy family.
- Monica liked a paella recipe, but the recipe was meant for 10 people. Her *Cooking Companion* was able to scale the recipe for her dinner for two, and also personalized it for her. For example, it suggested less Piquillo peppers and low-sodium variation of Sofrito sauce that's suitable for Monica's family.
- Rob recently visited Chad and likes the Capitaine (a fish native to Lake Chad) dish. He was trying to follow the recipe but realized late that he is running out of cumin powder. His *Cooking Companion* adjusted the recipe and mentioned to him that, though cumin is an important ingredient, it could be replaced by coriander, which Rob had in stock.
- Jim was making home-made bread for a party the next day by following a recipe on his smartphone. As he was kneading the dough, he forgot how much dried fruit to pour in the mixture in the next step. His phone screen is turned off, and his hands are covered in flour and sticky dough. Jim asks the phone app how much dried fruit he needs to pour into the dough, and the *Cooking Companion* speaks the exact quantity he needs. The phone also turns back on and goes to the section of the recipe that Jim was interested in knowing. The recipe listed nuts before dried fruit, but because Jim added dried fruit out of order, it automatically adjusts the recipe to show what still needs to be done.
- Sonya is waiting at the doctor's office and finds a great recipe in a food magazine that she would like to try. She takes a picture of the recipe with her phone and imports it to her *Cooking Companion*. The recipe is now in her wish-list and is also shared with her husband, Kano. Back at home, Kano sees the recipe on his tablet and his *Cooking Companion* tells him of the missing ingredients for the recipe. Kano is pleased as he can now go grocery shopping for the missing items, so that they will be ready to cook together by the time Sonya is back.



Figure 3. *Cooking Companion* seeks to remove the stress of cooking by providing amateur enthusiasts and working adults with a recipe interface that works around the constraints of cooking.

References

- [1] Wahid, A. (2013, July). How to enable and use the hands free mode feature of windows 8.1 food & drink app. <http://www.windows8core.com/how-to-enable-and-use-the-hands-free-mode-feature-of-windows-8-1-food-drink-app/>.