

# Understanding Motivations for Using Grocery Shopping Applications

*This case study of Foodie.fi, a popular grocery shopping application, reveals three main motivations for using the service and compares in-store and online shopping. Integrating a recipe service with the shopping application can engage users and enhance their diets.*

For more than two decades, researchers have been investigating how to technologically enhance the in-store shopping experience.<sup>1</sup> The focus has mainly been on applying shopping assistants at the point of sale,<sup>1–5</sup> but users employ multiple types of devices in multiple contexts and locations, not only in stores.<sup>6</sup> More research is thus needed to understand users' motivations for using shopping applications in the first place.

To explore such motivations, we studied the use of Foodie.fi, a popular grocery shopping application for mobile, tablet, and Web clients. Because Foodie.fi provides a wide range

of the features explored in previous research prototypes and small-scale trials, it offers a good representation of a real-world deployment of the various ideas presented in the literature. The service can be used both for online shopping and for enhancing the traditional in-store shopping experience. It also combines the shopping experience with online cooking recipes.

In this article, we focus on the following research questions:

- What are the motivations for using a shopping application?
- Why do people select either in-store or online shopping?
- In what kinds of situations is the service being used?

In particular, we investigate the use of digital shopping lists and how people use technological support to plan and execute their grocery shopping.

## Related Work

Traditionally, people have used shopping lists written on paper, usually composed at home, to refresh their memory when shopping. Only five percent of paper-based shopping lists are edited in the supermarket.<sup>7</sup> Furthermore, the transition from paper-based to digital shopping lists has been slow.<sup>8</sup>

*Digital shopping assistants* let customers request product information using pervasive technologies. Most of these applications are implemented for mobile phones and PDAs.<sup>1,4,9</sup> Another approach has been to integrate the system into a physical shopping cart.<sup>5</sup> Shopping assistants presented in previous research typically consist of one or more of the following features:

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product information, shopping lists, the user's location, price comparisons, ratings and reviews, and advertisements. Foodie.fi provides all these features either fully or partially, so it is a suitable example for this study.

Researchers have mainly performed laboratory tests and field trials focused on in-store use, but online commercial shopping applications, such as Google Shopper, ShopSavvy, and Amazon-Fresh, are gaining popularity. Although there is not much research on the use of these applications, because companies have been reluctant to release their data, a couple of early studies exist. One study of a widely adopted bargain hunter application in Switzerland found that the shopping assistant was used more often from home, with multiple devices, than at the point of sale or on the go.<sup>6</sup> This suggests that research should concentrate on use beyond the point of sale. According to another study, individuals use social commerce in grocery shopping mainly for fulfilling their functional needs; that is, they want to concentrate on shopping for their groceries, and additional functionalities are not considered as important in this context.<sup>10</sup>

With a shopping assistant, people often want additional information about items on their shopping list, for example, a price comparison.<sup>8</sup> To provide accurate price information, the listed products must be mapped to actual products.<sup>3</sup> Product information provided by a shopping application has been perceived as being better than static product information.<sup>2</sup> In a focus group study, people found shopping assistants useful when the product information was relevant and accurate, the integrity of the information was guaranteed, and the products had a bar code or tag to scan for available services.<sup>11</sup>

The decision-making process carried out in supermarkets differs from the way shoppers decide whether to purchase high-value one-off items, so these two types of shopping have different information requirements.<sup>5</sup>

Grocery shopping is often considered a routine activity.<sup>8</sup> It has been argued that only frugality and simplicity are required from any assistive grocery shopping application.<sup>5</sup> Consumers feel that the amount of money involved in their purchase is not high enough to warrant additional information searches at the point of sale.<sup>11</sup> On the other hand, a recent interview and shop-along study showed that food practices are a complex and situated set of actions.<sup>12</sup> In this article, we contribute to the field by studying people's motivations and attitudes toward grocery shopping and the use of an application in various situations, such as in-store and at home.

### **The Foodie.fi Service**

Foodie.fi is available in Finland in cooperation with a major retailer, S-group, and is linked to real-time product assortment and brick-and-mortar shops. With Foodie.fi, consumers can browse product information and recipes as well as compile shopping lists and interact with other users. Foodie.fi can be used to order groceries online with home delivery or to enhance the in-store shopping experience. People can access Foodie.fi via personal computers, mobile phones, and tablets wherever and whenever they choose. Foodie.fi is free of charge for consumers. Because the application is intricate and not known worldwide, we introduce its features here.

Foodie.fi helps users plan shopping activities and meals by providing personalized product and recipe recommendations. Users can specify their preferences, including favorite products, recipes, and special diets, to get better recommendations and find frequently needed items more easily. Users can search for products and recipes based on free text, categories, or recommendations; they can also like and review products and recipes and share the data to Facebook and Twitter. Figure 1 shows two views of the mobile application: the dashboard and the selection of a shopping item.

The service provides a shopping list, which can be either private or shared with family members. The selected recipes' ingredients, mapped to actual products, can be added directly to the shopping list. On the shopping list, users can change mapped items to other similar products. They can order the contents of their shopping list from the online store or use the list at the point of sale in the physical store.

Foodie.fi can be used on the go with the mobile client. Users can locate the nearest stores; at the store, they can view the shopping list, scan items, and pick recipes. The system organizes the items in the mobile shopping list based on the order of the aisles.

Foodie.fi also provides functionalities for social use. It is possible to publish the likes and reviews of products and recipes, including one's own recipes, and to follow the feeds of Facebook friends or of users who share their data publicly. Also, users can share their data to other social media services. They can control their privacy settings and select how they want to share the information they produce.

### **Method**

In many previous interview studies, the sample size was small and focused on certain socioeconomic groups, which might narrow the results by representing a certain view. We decided to create an online survey to reach a wider sample of people from different socioeconomic groups. The survey was emailed to approximately 2,000 recipients of a service newsletter. It is unclear how many of the service users actually read the newsletter; however, we had 202 distinct respondents to start the survey. Of the 202, we had 146 valid responses, which is not surprising, given that the open-ended questions were quite time consuming. We considered a response valid only if the participant finished the whole survey, and we excluded unfinished answers from the data. As an incentive to participate, movie tickets (each worth 10 euros) were raffled among respondents.

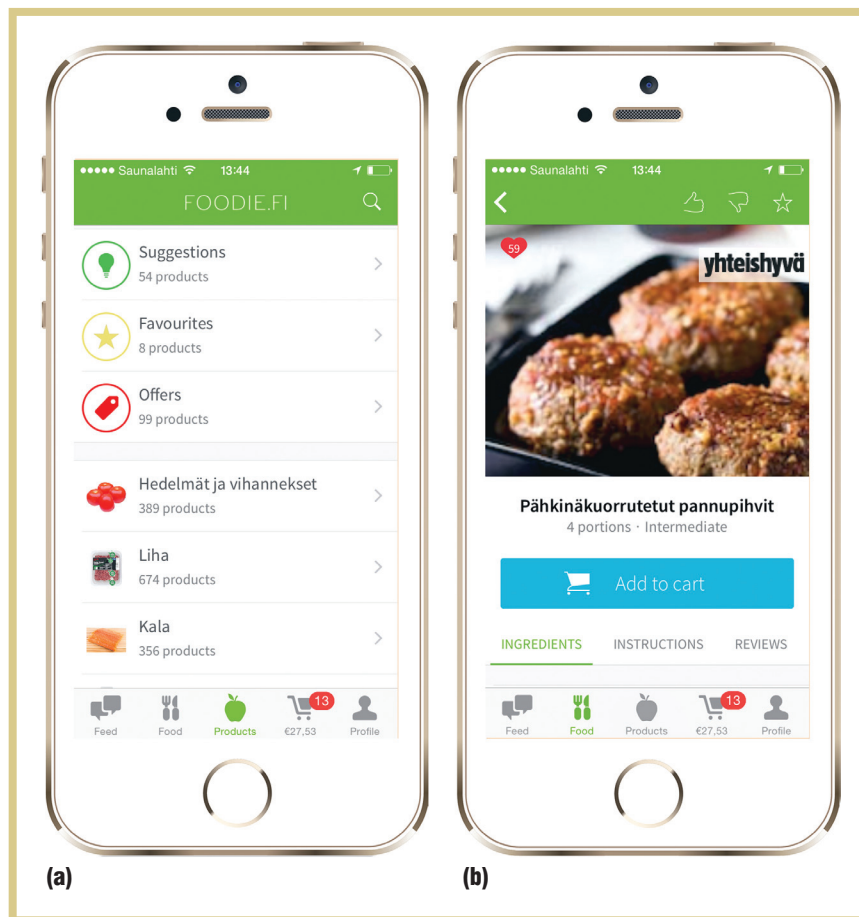


Figure 1. Two example screenshots of the Foodie.fi service: (a) the dashboard showing a collection of suggestions, favorites, and offers, as well as a list of product categories in Finnish; (b) a situation where the user has chosen an item of interest, and then could proceed to view the ingredients, cooking instructions, or reviews related to this particular recipe.

We included both structured and open-ended questions. In the structured part, we asked respondents to provide baseline information, which we present in the next section. We used open-ended questions to gain a deeper understanding of reasons for using the service. The questionnaire was originally in Finnish; answers were translated into English.

### Participants

Gender distribution among participants was fairly equal: 45.9 percent were male and 54.1 percent were female. Young adults (20–30 years old) constituted 16.4 percent of the participants. The biggest group (52.1 percent)

were middle-aged people, between 30 and 50 years. Interestingly, more than 29.5 percent of the respondents were over 50 years old. Most respondents (66.4 percent) lived in a suburb. A small percentage (13.7 percent) lived in a city center, and the rest lived in small towns or the countryside. 69.4 percent of the respondents lived with a spouse, and 37.6 percent had children. Based on these numbers, the demographics appear quite diverse.

Regarding frequency of use, 35.6 percent of the respondents used the application at least once per day, 24 percent once per week, and 37.7 percent once per month. The rest of the participants used the application rarely or did

not comment. Because the application can be used with multiple devices, we wanted to find out which devices were used. Multiple answers were allowed. Most participants used several devices (computer 65.1 percent, iPad 21.9 percent, iPhone 32.9 percent, other phones 19.9 percent). The service offers social networking functionalities, so we asked about the use of social networking sites: 74 percent of participants used Facebook and 26.7 percent used Twitter. We are not aware of statistics collected in Finland, but these seem to correspond rather well to Pew Research estimates of US social networking usage.<sup>13</sup>

### Data Coding

Data coding and analysis of open-ended answers were conducted using the principles of grounded theory.<sup>14</sup> Respondents did not stick rigorously to the topic of each question. Therefore, we recategorized the answers based on the actual answer during data coding, and we removed all open-ended answers that concerned only Foodie.fi (such as comments about specific features or software bugs).

### Findings and Discussion

Attitudes toward shopping and cooking varied from hate to love. In the study, we found three main motivations (covered in detail later). Based on this categorization, these three groups considered different features to be important.

The main drivers for selecting either in-store or online shopping are current phase of life and personal attitude toward shopping. People who are busy or face physical obstacles in shopping and carrying heavy bags are more prone to use online shopping.

We can examine our findings in light of the fact that 69.2 percent of the respondents did not use the online shopping feature at all—the other 30.8 percent used the system for online shopping at some point. Of the total number of participants, 20.5 percent used the service almost exclusively for online shopping, as discussed next in the Main

Motivations section. Participants used the service mostly at home, on computers and tablets, for planning their grocery shopping and menus. Some people used it also at the store, with their mobile phones available at all times. There were some mentions of using the service in idle moments, for example while waiting for someone in the car or on the playground.

### Main Motivations

We discovered three main user categories with different motivational drivers. This categorization was present in the whole data set.

- *Holistic meal planners* (45.20 percent of participants) are generally interested in cooking and shopping. They do not see food and shopping only as mere routine, but rather seek to find versatile and inspiring new dishes to cook, so they allocate time for selecting the best ingredients personally.
- *Memory extenders* (21.20 percent) tend to know what they need, but they want to remember everything, find new products, and ensure that basic groceries remain available. They view shopping as a routine activity. They would appreciate having prefilled templates based on either their shopping data or even whole menus based on their diet and preferences.
- *Online shoppers* (20.50 percent) are people whose current phase in life or physical condition complicates the act of in-store shopping, either because of the lack of time or difficulties in moving and carrying heavy items. The ease and timeliness of home delivery are considered important.

Table 1 gives a breakdown of the categories that emerged from the data.

Most users belonged to a single category. However, in special circumstances, such as throwing a party or having sick kids, users sometimes switched categories. The first two

groups shopped in stores and the third group shopped exclusively online. For 13.10 percent of our participants, no clear category emerged from the data.

**Holistic meal planners.** Some people enjoy spending time planning versatile menus and picking the freshest and best-looking ingredients from the shelves of their local grocery store. Our findings indicate that the close connection between the recipe service and the shopping list app enabled a deeper level of engagement. These meal planners use the system to gain inspiration for their cooking and shopping. The service can be used for widening the range of the diet, both in terms of health and variety, and it is also used to pass time. This contradicts earlier findings, which highlighted only efficiency and frugality.<sup>5</sup>

The current understanding of shopping assistant apps does not explain the behavior and needs of holistic meal planners—quite the contrary. However, the growing body of food research<sup>15</sup> indicates the increasing interest and the existence of an emergent phenomenon around food. The complete process from recipe selection to the dinner table is complex.<sup>12</sup> Therefore, grocery shopping applications can engage users more by offering support for the whole process, instead of concentrating only on the act of shopping, either in the store or online.

**Memory extenders.** Planning menus and shopping lists is not an exciting task for everyone. Memory extenders search the service for products and discounts. The need for basic ingredients usually remains constant. This group fits the picture painted by existing research. They feel that shopping is merely a routine activity.<sup>8</sup> They appreciate frugality and simplicity,<sup>5</sup> shop for products that they usually consume, do not plan menus beforehand,<sup>12</sup> and do not edit precompiled shopping lists at the store.<sup>7</sup>

Memory extenders wished for more guidance from the service, such as in

TABLE 1  
The main motivations to use a shopping application.

Main motivations	Number of participants
Holistic meal planners	66 (45.2%)
Memory extenders	31 (21.2%)
Online shoppers	30 (20.5%)
No clear category	19 (13.1%)
Total participants	146

the form of templates. Templates suggesting shopping lists and menus based on earlier behavior and selected diets would provide value for many users who are either busy or not interested in spending time on planning their shopping activities. Templates can also be used to nudge users toward more versatile or healthier diets. The active participation of holistic meal planners can be also harnessed to benefit memory extenders, because the history data of meal planners can be used to create template menus.

**Online shoppers.** Online shopping is a way to outsource shopping and select the products at a convenient time, even during the night. It is easy to do and saves time, with less impulse buying. In addition, there is no need to carry heavy bags. The user's current phase of life can make in-store shopping difficult. The recipe service was not so important for this group.

Online shoppers have distinctively different needs compared to the other two user groups—the holistic meal planners and the memory extenders. Therefore, the applications targeted at in-store clients should be designed to satisfy the needs of these two groups, and not to assume that current online shopping apps serve their needs well.

### Feature Sets

In addition to motivations, we analyzed the desired features that emerged from the open-ended answers. Many of the Foodie.fi features are similar to those of other shopping assistants—again,



product information, shopping lists, the user's location, price comparisons, ratings and reviews, and advertisements. However, other shopping assistants analyzed in previous studies did not include the social dimension. In our data coding, in addition to product information and shopping lists, the following categories emerged: recipes,

other than the one directly linked to the service.

Participants who did not use the online shopping feature appreciated the option to add free text. Final decisions about the actual product could be made at the store based on availability and last-minute decisions. For example, a user might list bread in general but then

as sample menus based on their personal profile.

The system should provide support for shopping within a tight budget, such as the ability to compile healthy and adaptable menus within budget and the ability to find discounts based on personal preferences.

## The integration of recipe services with the shopping list was popular as a part of meal planning; it was considered convenient.

in-store and mobile use, online shopping, and social sharing. Here, we present our findings about the use of these features.

**Product information.** In general, participants wanted accurate information about products. This was especially important for people with allergies or special diets, given that insufficient product information could lead to health problems. The system was also used for checking discounts, prices, and ads. Comparing prices and searching for new products was important for some users. Many participants wished for bargains based on product categories or their own profile.

Some participants reported that it was quicker to shop in a store after using the app, because they could check the exact product information at home in their spare time and compile the shopping list of suitable products.

**Shopping lists.** Participants typically used multiple features of the application while they were composing their shopping list. Usually, shopping lists were compiled shortly before the trip to the store or before the online order. Shopping lists were mostly compiled at home and sometimes during idle moments on the go—for example, while waiting for someone. Some also used the shopping list service in stores

select the specific brand and quantity once at the store.

**Recipes.** The integration of recipe services with the shopping list was popular as a part of meal planning; it was considered convenient. Participants were looking for either new or good recipes. They considered browsing existing recipes and searching recipes based on ingredients or category (for example, main course or dessert) as one of the most important features. In general, when the participants discussed recipes, their approaches could be divided into three groups: focusing on recipes, focusing on what to eat, and searching for inspiration. Participants who were especially interested in cooking used words like “inspiration,” “ideas,” and “enthusiasm” when they were discussing how they selected recipes.

Typically, recipes were searched based on ingredients. Participants selected ingredients based on different criteria, such as what was on sale or what was left in the fridge. Many participants appreciated the possibility to see what it would cost to cook a certain dish. Participants used the system to find recipes and products that matched their diet. The system was also used for improving one's diet, by comparing the healthiness of products. Several participants wished for more advice from the service, such

**In-store use.** Many participants did not mind going to the store. In fact, they wanted to see and feel the products, especially the fruits and vegetables. They explicitly did not trust someone else to make the decision, because they felt that product quality was very important. Some participants liked to choose the main ingredient in their recipe based on freshness and availability. When the system was used at the store, participants reported that they kept their mobile phone on with the shopping list visible all the time and removed the products from the list when they were put in the cart.

Several participants discussed navigating in the store. In this particular service, the products on the shopping list are arranged based on the aisles in the store, but it does not provide an actual indoor map and navigation instructions. Many participants found this approach helpful. Some others wished to have more detailed maps and navigation instructions.

Not everyone liked using the shopping list in the store. They felt it was clumsy and slow compared to traditional shopping (that is, using a traditional paper-based shopping list or shopping without a list at all), and that the display on the phone was too small. On the other hand, other participants felt that it was impossible to read small text on product labels, but it was easy to read from the display on their phone because they could zoom. Some respondents commented that they did not own a suitable mobile device. Scanning products was not used much, but people who used it found it convenient, both at the store and at home.

**Online shopping.** Participants who used online shopping said that they have a busy schedule or a physical condition that limits their ability to go to the store or carry heavy bags. Reasons varied from a recent injury to having two kids and no car. Some older people found online shopping very useful.

Many online shoppers thought that efficiency and set schedules were important. Deliveries happened on a set schedule; some users also shopped online according to a schedule, for example every Friday. They also appreciated the fact that they did less impulse buying.

Participants who did not use online shopping felt that the process would take too much effort and they did not want to pay for home delivery. They also appreciated the absence of a set schedule.

**Social sharing.** Social features were not considered very important. Instead, some people felt annoyed about the existence of the social feed. They wished it was possible to remove the social dimension, since they felt that it disturbed their primary goal—buying food. Participants expected the data they produced to be private by default. Most participants believed that their shopping data was not interesting for other people.

Social features were expected to fulfill a utilitarian need: access to personally relevant recipes or product information. In the best case, they were expected to help find inexpensive, effortless, tasty, healthy foods. The likes of other users were not considered important, or at least did not affect buying decisions; they were considered less important than other users' comments about products and recipes. There were high expectations for the quality of comments from other users. Very few users felt that sharing products and recipes to other social media services, such as Facebook or Twitter, was important.

As shown previously, family life involves a lot of mundane activities that

need to be planned and coordinated.<sup>12</sup> A shared shopping list was considered important to involve all family members in planning enjoyable meals and in the creation of shopping lists. Involvement of family members can greatly influence overall consumption. However, private shopping lists should be simultaneously available. Family interaction with multiple levels of privacy should be supported. Both selected recipes and shopping lists should be available inside the family circle.

#### **Locations and Devices**

This study, as well as an earlier study,<sup>6</sup> showed that grocery shopping applications are mainly used at home, where people plan their shopping and check what is needed whenever it suits them best. Previous studies have already shown that people compile their shopping lists at home and seldom edit them at the store.<sup>7</sup> Use of technology changes over time, but the underlying process remains the same. People use multiple devices at home, not only desktop computers, to access the service.

In most cases, the shopping list is compiled at home, although in-store use does occur on occasion, and in contrast to results from an earlier study,<sup>5</sup> such in-store use of the mobile

accordingly. For them, the shopping experience is not just a straightforward execution of a strict plan.

Prefilled shopping lists are typically used in the store. Occasionally, people search for new recipes based on an ingredient that looks good or interesting on the shelf. Therefore, the application should have different modes for home and in-store use. If in the future there are access points to the service other than personal mobile devices (such as a device integrated into the physical shopping cart), it should be possible to access personal shopping lists.

#### **Limitations**

Our recruitment method did not let us reach all users or the whole population—only those who had signed up and paid attention to the newsletter. Because the goal was to research extended use, this approach was successful in finding the target group. We were also able to find a diverse sample of participants. The online survey allowed us to reach more people compared to in-person interviews, but it did not allow us to continue discussions with participants about emergent themes. Cultural differences might also have an effect on attitudes toward shopping, but we didn't investigate that.

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application did not embarrass users. Mobile phones have become such an integral part of our lives that people feel comfortable using them in different situations. Holistic meal planners, in particular, sometimes look around in the store and feel the items to identify what's fresh. Then they might consult the recipe service to find a recipe matching these ingredients and shop

Besides finding that different types of users benefit from different features, we also found that the shopping application was used for inspirational purposes. Although we did not study online grocery shopping as such, it is important to acknowledge that the needs of online shoppers differ significantly from the needs of those who explicitly want to

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shop in grocery stores. Needs also differed on the basis of general attitudes toward shopping and cooking.

Thus, systems should offer two modes for different shopping styles: a plain mode supporting efficiency and a richer mode supporting inspirational meal planning. Shopping applications with an online recipe service can enhance the engagement and shopping experience of in-store shoppers. Having a close connection between recipes and shopping lists with accurate price information can also help improve diets and move participants toward more versatile selections, even in situations with tight household grocery budgets.

Future systems could gently guide people toward healthier eating habits. For example, recipe selections and shopping-list data generated by the more active users could be used to create recommendations and pre-filled templates for users who have less time for planning and shopping. The system could also help people find healthier and more affordable food by combining recommendations and templates with price information. Furthermore, the availability of digital services in cooking situations could help people with less cooking experience make affordable meals from scratch, instead of buying unhealthy food. Or, alternatively, such services could provide options for healthier ready-to-eat meals. ■

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