

Introduction to Human-Computer Interaction

Project ScanList: shopping list manager and product scanner

Organization of the mini-project – the project has to be done **in pairs** and contains three phases:

1. **Design phase**, during which you will create mock-ups, prototypes and storyboards of your interactive application. This part of the project is to be done in Balsamiq Mockups and you should use the tools available in the application to comment and justify your design choices. This work obviously will be taken into account for the final grade (originality of the proposed interface and interactions, quality of the mock-ups and storyboards, relevance of the explanations and justifications). *A lab session will be dedicated to this design phase.*
2. **Then you will prepare the implementation** by creating the corresponding functional tables, state machines and widget trees.
3. Finally, you will **develop the application** using Visual Basic (Visual Studio 2015). Make sure to be very careful with the code: follow the naming conventions presented in the class/labs, comment your code, indent it and organize it in a coherent way. You will have to implement the interface, a set of interactions and the functionalities required for these interactions in order to have a “real-scale” prototype without necessarily implementing the functional core of the application. *A lab session will be dedicated to the programming, but you are strongly encouraged to start before it.*

You must **hand in your code for the last lab session** during which you will also briefly demonstrate your application to your teacher.

Reminder of important dates:

- Design session: session #9 (May 2-9, and May 15 for those having class on Mondays)
- Deadline for handing in the design report: before the programming session, May 19. (content of the report : see Moodle for details)
- Programming session (have the design report completed): session #12 (between May 22 and June 2nd depending on the groups).
- Demo session and deadline for handing in the project: before session #14, last session (June 19-23).

The two project sessions are not enough to complete it. You have to get organized within your pair to make regular progress on your project until the end of semester.

1. Project scope and goals

You got used to do your shopping in a supermarket that allows you to scan the items you are buying with a scanner, letting you record the items you are putting in your caddy and making the checkout faster. At the same time, you are also accustomed to using an application letting you manage your shopping list. Noticing the inconvenience of the situation, a phone in one hand and a scanner in the other, you realize that it would be great to create an application that lets you do both actions together. The main idea is to be able to prepare a shopping list at home, selecting from the products available in the supermarket, and then to use the phone to scan the products while shopping, automatically indicating which items have already been scanned and which items still need to be bought. Therefore, for this project, you have to think of an interface allowing you both to define a shopping list from a list of available products and to do your shopping with a phone that contains this list and allows you to pay, after a possible verification by the cashier. This verification is performed after the user indicates that the shopping list is complete. A bar code is then displayed on the phone, which the cashier will be able to scan using their own scanner, for a validation including a possible verification that all items were indeed scanned.

Note that you have to develop an interactive *high fidelity* prototype, that is a complete interactive interface but without all the functionalities that are not directly connected to the interaction. For instance, the action of scanning a product may be replaced by manual input of its bar code, but after having displayed the scanning screen.

A. Basic elements of the application

The functionalities and basic elements required of your application, for which you have to develop an interface and the corresponding interactions, are the following:

- adding an item to the future list from a list of categorized products, available in the application, including optional input of the quantity;
- removing an item from the list;
- retrieving and continuing with a saved list;
- sending the list to other users as a file;
- loading a list sent by another user;
- scanning a product and optionally specifying the quantity before putting it in a caddy;
- scanning a product only to obtain its price;
- removing a scanned product;
- displaying the total price of scanned items;
- indicating that the list is complete and proceeding to validation;
- paying once the list of scanned items is validated by the cashier.

B. Interaction

You are free to create any interfaces, menus and widgets as long as you try to remain in the constraints of a mobile context (small screens, limited number of physical buttons ...). Don't forget that you will develop a prototype using conventional desktop widgets, which you will have to adapt to your needs by modifying their properties. Certain interactions typical of a mobile platform are non-existent on the desktop, but can be easily imitated. For example, a long press on the screen may be implemented using a *timer* inside a function that handles the mouse press event. Other interactions, such as multi-touch gestures (i.e. gestures with several fingers) are difficult to imitate. You can still propose them in Balsamiq prototypes as long as you justify your choice. In this case, replace them by a different interaction in the Visual Basic prototype, while making obvious the intended interaction.

2. Extending the interface of the application

The basic application is rather minimalistic. Performing this work will get you at least the average grade (if of course both the design and implementation work has been done seriously and within the deadlines). Extending the application with interfaces and interactions for one or more of the functionalities listed below (or others of your choice, approved by your teacher beforehand) will allow you to make progress and to significantly improve your project grade. The functionalities themselves will not influence your grade.

You can design and develop interactions for other functionalities, such as real-time list sharing rather than sending by mail or SMS; indicating the path to follow in the supermarket to find a particular product, given the current GPS position and the position of the last scanned product, even proposing an optimized path in this supermarket based on the list, etc. It may also be interesting to be able to type certain keywords in order to select more rapidly a product, rather than having to browse through a list. Feel free to suggest other functionalities useful for the consumer. Nevertheless, interfaces and interactions that you chose must be present throughout all phases of the project, starting with the design.

3. Development help

During the first phase (design), you will not be given any technical assistance to avoid influencing your design or limiting your creativity. After the deadline for the design phase, we will give you some suggestions for implementing the functionalities of the application.

4. English translation of the description of the design report given on Moodle

The design report, to be handed in by **May 19** (a pdf file) will have to include:

- an introduction,
- a commented use case diagram
- a description of what makes your application original

- a detailed description of your design, that is, commented screen shots of mock-ups of all application windows
- either a navigation diagram, or a stage/transition diagram, between all windows
- a widget tree
- functional/interaction tables
- a conclusion