

# Touch-Based Services' Catalogs for AAL

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**Abstract.** Elderly people living alone at home need support for daily activities. For this reason, the AAL initiative promotes technological adaptabilities but bearing in mind that it is crucial serving users in terms of usability. In this paper, we present a position paper for supporting elderly needs by simple touches of services' catalogs. Further, we propose a generalization of these services based on four examples: shopping list, catering, calls and mobile prescriptions.

## 1 Introduction

Nowadays population is aging alarming rate worldwide. A consequence, some problems like independence, safety, difficult to relate with technologies to support their daily routine due to cognitive declining, are problems that governments try to solve with many initiatives because the progressive aging of people has economical consequences, not only for future decades, but already these days.

AAL promotes the use of technologies for helping elderly people in order to maintain their autonomy, increasing their quality of life and facilitating their daily activities for augmenting the time living at their homes. For this reason we have considered the mobility as one of the most important problem for AAL [1]. In this line, the European Commission encourages technology and innovation for AAL. This fact makes that, research community in this area, believes important of adapting technologies for supporting elderly people living alone at home. However, this kind of technologies must be closer to this kind of users, minimizing the interaction, even trying to make disappearing it. The reason, as we mentioned before, is old people are not familiarized with technologies. This implies it would be desirable an interaction as simple as possible.

There are works that use touch-based technologies for supporting elderly activities. In [2], authors propose a NFC-based system for supporting elderly people to choose their meals to be delivered by means of a home care service. In [3] a proposal for NFC-based assisted living with a shopping list assistant is presented. Our experience for supporting elderly by adapting NFC technology is varied. In [4] a proposal for supporting Alzheimer caregiver can be seen. Finally, how to enable mobile prescription can be studied in more detail [5].

Bearing in mind all above described, we propose a solution to improve the care-dependent people's autonomy by using NFC-enabled mobile phones with tags services' catalogs. Moreover, since the user interacts with catalogs in an easy and natural way, people's reticence of using new technologies because most care-dependent people are not familiarized with them, will not be a problem.

Under these lines, we present four solutions for elderly: shopping list, catering, calls and mobile prescriptions. Next section we propose a generalization through tags-services catalogs with the correspondent taxonomy, architecture and middleware. Finally, conclusions are drawn about this position paper.

## 2 Touch-Based Applications Examples for Elderly

In our previous works for supporting daily activities for elderly people, we began with simple applications. In this sense, we have developed four proposals: the shopping list, the catering service, relatives and friend calls and the mobile prescription service. In the first one, we try to solve people barriers going to the supermarket. They need assistants for carrying out their daily needs of food or articles for cleaning home. In this sense, we have prepared carefully a products' list with a number of tags covered by the correspondent icons as it can be seen on the left of figure 1. By touching icons representing needed products, the assistant receives into the mobile phone the necessities in a transparent mode and carrying products to elderly home. The second application corresponds to the catering services (see the second picture in figure 1). Some dishes are disposed in starters, main and desert courses. It works similar to the shopping list. In the third application, calling relatives and friends is possible through NFC technology by only touching photos-albums (see the third picture in figure 1). Finally, the mobile prescription (see last picture of figure 4) is a more specialized solution although the same process by touching tagged medicines' boxes has to be handled. This fact solves the problem to obtain prescriptions where patients have to phone the healthcare center for arranging an appointment with the doctor. After that, they have to go there, wait for their turns to come and go back home with the prescription papers. All these activities make care-dependent people's life even more difficult, especially for those who have mobility problems. Mobile Prescription claims to improve care-dependent people's quality of life. To that end, patients will be able to obtain the prescriptions of their medicines from home, without having to go to the health-care center.

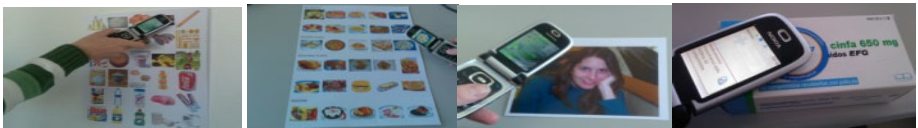


Fig. 1. Shopping List, Catering Service and Calls

## 3 Tag-Services Catalogs

After these experiences, we propose a solution for generalizing the idea and, at thus way more services can be managed by using this technology through touching interaction. In the next point we present our proposal for managing services catalogs involving providers and customers.

### 3.1 Architecture

Our architecture can be seen in figure 2. We propose a cloud services for customers. In it, providers can connect to obtain automatically the mode of producing their catalogs. In this sense, it is necessary a usable process to define products management and the communications process. Initially, we propose the Quality-of-Service Network model (VQN) in order to build an efficient and highly functional communication platform [8]. VQN is a semantic overlay network implemented as a distributed application by means of an object oriented middleware for distributed systems (i.e. ZeroC ice). For the communications process, our idea is a middleware whose structure is represented in figure 2.

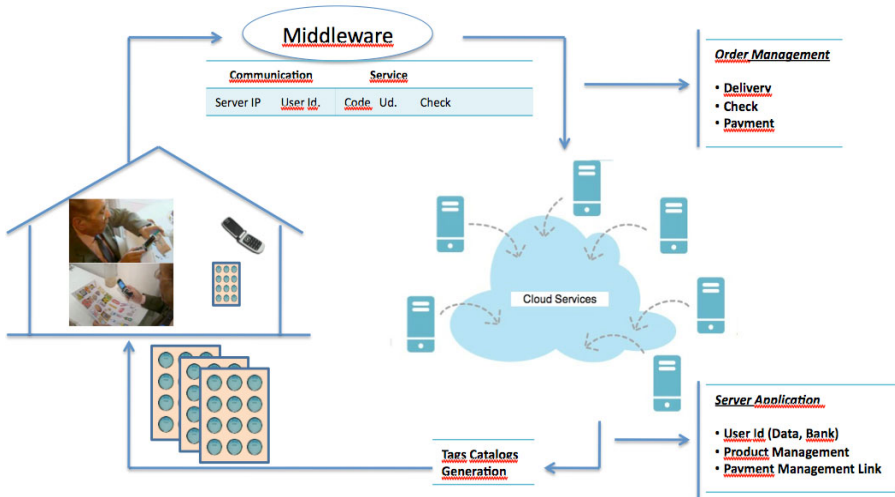


Fig. 2. Architecture and Middleware

### 3.2 Services' Taxonomy

In order to study services' needs, it is important to explore all the requirements of the information transmissions. Table 1 shows an example of the four mentioned applications. In it, we can see catering service (CS), shopping list (SL), phone calls (PC) & mobile prescriptions (MP) examples. Additionally, products descriptions with the identification and check control can be observed. In the case of shopping list or catering service, the check control is produced when receiving products at home through assistant catalogs touches. In the case of pharmacy, it is received by GPRS from the doctor server as a combination of user and product identification. This check will be necessary for obtaining drugs at the pharmacy.

With these needs we propose a middleware for mobile phone that includes this structure (communication and services identification), this fact will make possible that elderly do not have to change their mobile application when needing a new services' catalog. For that, providers, with our definition process in the cloud services, can adapt automatically their own products' management.

**Table 1.** Data Communication Structure

Communication		Service		
Server IP / Phone Number	User Id. / Phone Number	Product Id. / Relatives or Friends	Ud.	Check
167.165.76.32	1221450012	CS-Chicken-17001	1	Received? Ok
167.165.76.32	1221450012	CS-Salad-17005	1	Received? Ok
167.165.76.32	1221450012	CS-Banana-17011	1	Received? Ok
192.181.92.11	1221450012	SL-Milk-29002	1	Received? Ok
192.181.92.11	1221450012	SL-Bread-29087	1	Received? NO
189.178.11.43	1221450012	PH-Nolotil-34090	1	340901221450012
189.178.11.43	1221450012	MP-Espidifen-56897	1	568971221450012
189.178.11.43	1221450012	MP-Gelocatil-87576	1	875761221450012
677 432 657	675 666 980	Daughter Ann	-	-

## 4 Conclusions

We have studied how to address the elderly people's technological barriers for living alone by using NFC technology. First of all we have implemented some applications reducing the interaction by only touching tags. Then, a generalization is proposed through the combination of middleware, communication protocol and server applications in a cloud services. After all, we are seeking to find a manner to generalize touch-based applications on mobile phones, which have not the server-side deployment issues by leveraging from the Cloud Computing paradigm.

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