Redesigning Mobile Phone Contact List to Integrate African Social Practices

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Abstract. During the last decade, the design of social software involving the mobile phone contact list has been an active field of research. Systems, mostly those based on awareness, addressed many issues of social interest such as group communication or social ties building and strengthening. Yet, the mobile devices contact lists, as they are designed until now, do not efficiently take into account the social connections. Besides, the social connections are the principal provider of contact entries. Moreover, the current contact lists do not allow to efficiently retrieve/remember a contact who is forgotten or concerned by homonymy. Focusing on African social practices and behaviors, this paper proposed to redesign the contact list by integrating social relations that link people. This redesigning is accompanied with novel functionalities that will facilitate contacts retrieval, homonymy resolving and contacts remembering.

Keywords: Contact list · Contact information · Mobile phonebook · Mobile recommendation · Social relation · Social software

1 Introduction

One of the basic features offered on a mobile phone is the contact list. The contact list basically stores phone numbers, names and surnames of people who are the contacts of the mobile phone owner. The contact list primarily enables people to call their contacts without having to remember and dial the contacts phone number. Today, smartphones offer contact lists with elaborated features comprising a diversity of input fields that serve to identify and remember a contact entry. Some of the common input fields are for providing detailed information such as multiple phone numbers, names, surnames, email addresses, physical addresses, organization, notes about the contact, etc.

The social practices of African people make their contact lists to grow rapidly and significantly. A mobile phone can easily contain one hundred or more contacts entries. For example, a frequently observed social practice in African societies is that when a problem has to be solved, people use to resort to an acquaintance who, will in turn resort to his own acquaintance and so on until the right

one who can actually help solving the problem. In this endeavor to solve the problem, several types of social relations (mainly family and friendly) are mobilized and can spontaneously give rise to the creation of new entries in the contact lists. To formally argue this reality, the researches of Fiske [1,2] that explain how people construct social relations can be cited. Fiske stated that people in all cultures use the same relational models to generate most kinds of social interactions. However, based on his fieldwork among the Moose[1] of Burkina Faso, he noted that the Moose implement the models differently, in different domains, and in different relative degrees, than Americans. The "crowding" in contact lists causes the number of the rarely called contacts to be important. It also gives rise to more homonyms occurrences. These two realities, i.e. rarely called contacts and homonyms, together make the contact lists, even on smartphones, not always helpful when we need to remember a particular contact. Integrating African social practices in the design of the contact list software can contribute facing such a problem and can moreover provide additional smartness and usefulness to mobile phones. This paper stands for that and looks for providing African people with a mobile phone which is in phase with their social practices and behaviors.

In the remainder of this paper, we deal in Sect. 2 with related works, present in Sect. 3 the new design of the contact list, describe in Sect. 4 novel functionalities and conclude the paper with Sect. 5.

2 Works and Inventions Involving Mobile Contact List

An example of study addressing the cultural model of African countries has been to build, based on the cultural values of peasants, opportunistic networks for facilitating and automating the collection and synthesis of agricultural information [3]. In this paper, we are about to take into account African social practices and behaviors in the design of the mobile phone contact list. Several works and inventions related to mobile phone contact list were made. They covered systems built around the concept of awareness and besides many other issues were addressed. Some mobile systems, based on situation-awareness [4–6], are found under the vocabulary of recommendation systems. The principle of recommendation systems is to make the contact list smarter. Intelligent interactions with the mobile phone are introduced. Provide mobile phones with applications based on awareness together with efficient initiation of group communications has led to authors proposing a community-aware mechanism [7] that allows to efficiently select contacts in order to address them as a group. Mobile phones are thereby provided with a contact recommendation engine that help an initiator of a group efficiently constitute a group from his contact list. Hendrey et al. [8] invented a system for location-aware connections of telecommunication units involving group communications. They provide a way for automatically and/or selectively initiating communications among mobile users in a communication system that has the ability to determine a geographic location of mobile users.

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[1] The Moose (or Mossis) are the ethnic majority of Burkina Faso.

Another aspect of social software that rely on mobile contact list is to make smartphones able to support mobile awareness and collaboration [9,10]. Systems that are able to disclose information about their users' presence motivated some authors [8] to redesign the smartphone contact list to provide cues of the current situations of others for the design of a mobile awareness application. The software interactions were designed based on social psychological findings. Many other works addressed contact information update and exchange. A method for updating automatically mobile phone contact list entries was disclosed [11]. Analyzing systems that provide phonebook and bookmarked links to web sites for mobile users, some inventors [12] found that the way in which they store, process, maintain and present or display this phonebook and browser information to their users is limited and imperfect. So, their invention disclosed updatable dynamic phonebook capabilities that provide a user with both contact information and dynamic network web content that can be updated by communications between a mobile device and a server. A system that proceeds with synchronization and updates through communications between the mobile phone and a data service provider was also proposed [13]. It enables the mobile phone to initiate an appropriate form of communication with one of the contacts given the circumstances. Regarding contact information exchange, a method [14] of sending contact list data from one mobile phone to another mobile phone allows to eliminate the need to re-key individual contact data. Short Message Service (SMS) or Multimedia Messaging Service (MMS) is used to exchange contact data between mobile phones within a group. A system for exchanging contact information was built based on an information server [15]. The location of the mobile device is used to gather contact information. To the end, the output of the system is a list of proximate users that is transmitted to the mobile device. This review of the literature lets us note that the idea of redesigning the mobile contact list to integrate African social practices is not yet addressed.

3   The New Vision of the Mobile Contact List

Traditionally, a mobile contact list is a contact database stored in a mobile equipment memory. It can be viewed as an object subjected to diverse transactions such as its use in social software. The proposed new mobile contact list is a set of linked entities $(C_j)_{1 \leq j \leq n}$ as the graph of acquaintances in Fig. 1 shows. Each entity C_j represents a contact and defines a node in the graph. A contact is generally a physical person who can be modeled using attributes and treatments as in object-oriented programming. The attributes serve to characterize a contact in such a way it is easy to identify him. Classically, the attributes include names, physical and email addresses, private and professional addresses, phone numbers and can provide an item for notes in order to add discretionary information about the contact, etc. The treatments to which a contact list may be subjected to are mainly operations for the contacts management: insertion, deletion, selection, update and displaying. A contact list is so defined as a set
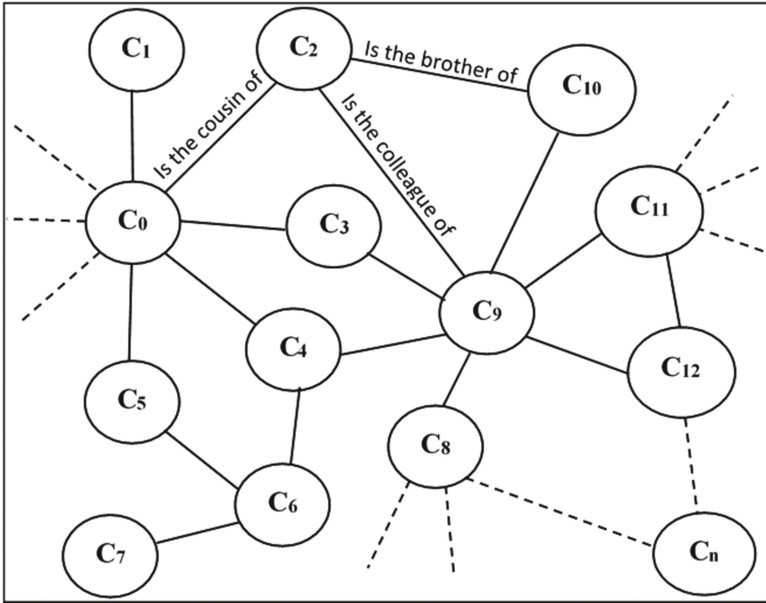
Fig. 1. Contact list as a graph of acquaintances

of n entities $(C_j)_{1 \leq j \leq n}$, each with specific values of the attributes and commonly shared treatments. Beyond this view, a contact list can be seen as a set of entities which are linked by social relations. In the graph of acquaintances of Fig. 1, the relations between the contact entities are the edges that link the different nodes. These ties between the contacts are the major foundation of the contact list redesigning we deal with. Any type of social relation can be considered. However, we focus on meaningful social relations that are of current and cultural considerations in daily life of African societies. Table 1 presents three categories of these relations without claiming exhaustivity. In the table, a tie is named according to the format "*Is_the_X_of*" where X denotes the type of relation. An edge in the graph that links two nodes C_k and C_l by the relation "*Is_the_X_of*" will carry the information that "C_k is the X of C_l". E.g.: let C_k and C_l be the contacts named respectively Ali and Alex and tied by the relation "*Is_the_brother_of*", we'll read that "*Ali is the brother of Alex*" (i.e., "*Ali is Alex's brother*" in good English).

In this new vision, the existing uses of the mobile phone contact lists are not affected. In particular, social software based on mobile contact list need not be modified. However, additional smartness is brought to some treatments regarding the contact lists.

Table 1. Some meaningful African social ties for contact list

Category	Name
Family ties	Is_the_father_of, Is_the_mother_of, Is_the_son_of,
	Is_the_daughter_of, Is_the_brother_of, Is_the_sister_of,
	Is_the_cousin_of, Is_the_uncle_of, Is_the_sister-in-law_of,
	Is_the_wife_of, Is_the_husband_of, Is_the_aunt_of, . . .
Friendly ties	Is_the_classmate_of, Is_the_friend_of, Is_the_buddy_of,
	Is_the_comrade_of, . . .
Professional ties	Is_the_colleague_of, Is_the_collaborator_of,
	Is_the_director_of, Is_the_hairdresser_of, . . .

4   A New Vision of Some Functionalities

The proposed contact list will engender some novel smart treatments regarding contact list. For instance, it will be an interesting instrument of reminder. Indeed, the attributes of classical contact lists are not always sufficiently helpful when we want to remember who a contact represents in the real life. However, cultural practices that rely on social ties between people can be more helpful for remembering the contacts. Let us consider a contact list with a rarely contacted contact C_j. The simple visualization of the contact C_j information is not sufficient to remember who C_j is in the real life. Thanks to the new design of the contact list, social relations between C_j and other contacts can be displayed to help remember who C_j is (see *Algorithm 1*), and then initiate any form of communication with him. Another situation is the need to remember and select a contact C_j when there are L homonyms (see *Algorithm 2*). In this case, before initiating a communication with the desired contact, we need to select the right one. So, for each homonym of the list, its social ties with other contacts are displayed and analyzed until the right contact is identified. A third situation (see *Algorithm 3*) is the search for a contact C_j. We assume that we don't remember the contact information (including its names) and we just remember one of its social tie (e.g.: C_j is the cousin of C_k). The first thing to do is to execute a search operation on C_k, then filter out to display only the contacts which are linked to C_k by the right social tie. The contact C_j which is searched for is among these latter contacts (Table 2).

In addition to the three novel functionalities described above, the new contact list may provide new cues for the design of mobile awareness applications. The new cues may be based on the social relations that link the contacts. Moreover, as group communication is often performed with members of a community existing in the real life [7], social ties could facilitate the broadcast of social events (e.g.: weddings, funerals, family meetings, etc.) within a close group of contacts. Recommendation systems can work based on the social ties of a mobile device owner and suggest him the contacts with whom the information about a given social event must be shared.

Table 2. Algorithms of some novel functionalities

Algorithm 1	Algorithm 3
begin	begin
read C_j;	read C_k;
print C_j social ties;	print C_k social ties;
check social ties;	filter out social ties;
if C_j	check social ties;
then select C_j;	if C_j
endif	then select C_j;
end	endif
	end

Algorithm 2
begin
   read C_j;
   for $i = 1$ to L
      print C_i social ties;
      check C_i social ties;
      if C_i is the right C_j
        then select C_i; break;
      endif
   endfor
end

5   Conclusion

A new vision of the design of mobile devices contact lists was proposed and described in this paper. Social relations in the particular context of African social practices are the key of the new vision. The new contact list is a set of contacts linked to one another by social ties such as family or friendly ties. Three novel functionalities engendered by the new contact list make it a practical instrument of contacts reminder and homonymy resolver. We also noticed that the new contact list could provide new cues to some existing social software in the mobile domain. This paper acted as the birth stage of the new contact list as it was limited to the development of the idea rather than its implementation. However, our future work will focus on deepening the idea as well from its implementation aspect as to its potential appropriation by the targeted beneficiaries.

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