ABSTRACT
In this demo, we present Social Composer (SoCo), a CSCW system for mashup creation based on social-awareness approach. SoCo aims to support end-user when he is specifying mashups to compose existing services in order to create a new ones through the mashup creation environment. SoCo provides services recommendation as auto-completion for user's partial mashup specification. These recommendations are based on social networks implicitly built from the interactions between users and services, and the different services compositions operated by the user's social network members as well as the global social network.

Author Keywords
Social networks, Web Services Composition, Social Interactions Analysis, Social-Aware, Mashup Creation.

ACM Classification Keywords
D.2.6: Software Engineering, Programming Environments, [Graphical environments]

General Terms
Design, Human Factors

INTRODUCTION
Creating value-added services by reusing the existing service components, which is well known as service composition, has been a key issue service science and has been heavily investigated from both industrial and academic perspectives especially related to web services [4]. However, with the emergence of the Web 2.0, it is becoming more and more important to make the composition process much more end-user oriented. The semi-automatic services composition approach has the main advantage of making the user participate in the composition process.

Indeed, Web 2.0 main paradigms are people-centric Web, participative Web, and read/write Web [2]. Web 2.0 harnesses the Web in a more interactive and collaborative manner, emphasizing peers' social interaction and collective intelligence, and presents new opportunities for leveraging the Web and engaging its users more effectively. Thus, Web 2.0 based social applications such as MySpace, Facebook, etc. has started to become an interesting source of knowledge to the services composition research community.

TOWARDS A SOCIAL-AWARE SERVICES COMPOSITION
Semi-automatic Web services composition has taken several forms evolving over time from simple graphical tools to semantic-based tools. A current evolution of semi-automatic composition is what is now commonly called Mashups. This latter evolution translates the emergence of Web 2.0 and more specifically the aspect of User Generated Content (UGC). This has helped the emergence of a multitude of methods for semi-automatic Web services composition which we have categorized into three major categories: (i) single end-user oriented, (ii) domain or community oriented, and (iii) social network oriented.

Both community and social network oriented approaches aim at considering the produced knowledge to enhance the end-user service composition in cooperative environment. This generated knowledge could be either explicit as annotating, ranking, and rating services, or implicit knowledge by automatically processing extracted rules in order to build a recommendation system. Thus, several works have been launched around this area to exploit the knowledge of the mass in order to improve the composition process by considering either social networks or collaborative environments [3]. A social network can not be considered in the community approach because it describes specific structures. The major difference is that community describes a gathering of individuals around a common topic of interest, generating communities specialized in particular areas (what justifies this approach). On the other hand, the knowledge which can be available in social networks can be richer than the one of specific communities.

On the other hand, Mashups are a new emerging paradigm of Web 2.0 with the aim of enabling end-users to easily create new web-based applications and services that address their specific needs and interests [5]. Several IT actors offer Mashups creation Web environment such as: Microsoft Popfly\(^1\), and Yahoo pipes\(^2\). From the end-user point of

\[^1\] \text{http://www.popfly.com/}

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view, Grammel and Storey [1] investigate tools and environments for creating Mashups. This analysis highlighted the need for a consideration of a community however it comes that all selected Mashup creation environment makers do not offer social networking features at all. To our knowledge, there is no work in this area which clearly uses this kind of knowledge. Thus, there is a need for more investment in this direction and the work we are performing fits perfectly with this issue.

Figure 1. General architecture of SOCO.

Our objective is to show how information can be extracted from social networks in order to be exploited in a composition task. in other words, how to leverage social interactions in a way to enable and facilitate composite services creation? The next section discusses our ongoing attempt to contribute to this area by demonstrating our approach in Mashup creation environment.

A FRAMEWORK FOR SOCIAL-AWARE MASHUPS

SoCo is a CSCW mashup creation environment based on social-awareness approach that aims to support end-user when he is specifying a composing schema using existing services in order to create a new mashup. SoCo provides services recommendation as auto-completion for user's partial mashup specification. Figure 1 illustrates the general architecture of our framework, called SoCo (for Social Composer). To help the user in the composition process, SoCo offers two main components: (i) social knowledge extraction and modeling component and (ii) the recommendation manager.

Social networks we are considering at this stage is an implicit structure inferred from the common composition interests of users. At outputs from extraction and analysis phases, we obtain two types of data: A profile of each user and the social proximities. The profile of a user will contain a number of metrics that describe interactions with services, in other words, his history of creating services and their uses. Among those information, we can find for example, the number of services used in the composition, patterns of compositions of created composite service (sets of services succession). Social proximity is calculated on the basis of counting interactions between two users.

Figure 2. Services recommendation illustration.

The recommendation system aims to help the SoCo user during the creation of a service by proposing services to compose according to the current status of the service composition process (i.e. which service can be better to come after the current selected service).

More concretely, when it comes to the creation of a service, i.e. composed service, through the SoCo service creation environment, a user generally is undecided about the selection of a service as a successor for a given service in the composition diagram. In this situation, the recommendation system will propose a list of services ranked on the basis of information provided from the social network analysis as shown in Figure 2. The ranking process is made according to the recommendation rank of each service. Thus, the importance of a service recommendation is proportional to its use on one hand and to the social proximity to the social relatives on the other hand. This means that more a service is used in this social network more the recommendation is important. Similarly, more users are close in the social network to the current user, the services they use are better recommended (according to the current need). Moreover, more users who use certain services are experts; their choice is more relevant making the recommendation more important.

REFERENCES