ABSTRACT

At the current times, we currently work with excess of personal information that are available to us. Part of this data is in our social network, like people we know and with whom we communicate regularly. However, the current available tools make it difficult to access and view such rich network, including even details of our communication. Another shortcoming found is that these same tools don't make the relationship between personal and contextual information available to the user.

Based on the gaps found in the main work in this area, we considered that it was necessary to build a system capable of allowing users to have a general knowledge and full development of their relations with others. We also found that this system should have several tools that allow the users to analyze in detail the evolution of their interpersonal relations, showing the data in a convenient way, practice and in the shortest possible time.

So, we considered that was essential to create an innovative program, which respond to the needs of the user in a fast, effective and visually attractive way. Outset, we idealize, based on the best qualities of other solutions.

As a starting point, we started by drawing a set of prototypes. Once validated, these were the base to the development of our solution. Then, after the same early prototypes are sealed, we initiated a process of implementation of various modules, based on best practices and tools that Rich Internet Applications have available.

The validation of our approach took place in two distinct phases, whit a set of tests with simple tasks. In a first phase were made pre tests to optimize the program and the tasks to perform. Here, we analyze possible difficulties and possible failures of LiveLife. The next stage consisted in performing new tests with the optimization of the previous phase completed. This phase was crucial for the whole development of the project because it was through it that we have reviewed and have concluded about the effectiveness of our solution.

These conclusions showed us in a generally and succinct way, that users were able to quickly find effective and relevant personal patterns in information viewed with the help of LiveLife, on their interpersonal relations. In this same stage, we also received some suggestions that may be useful in the development of future work.

What we lacked refer here, and that we purposely left to last place, was to explain concretely what Live Life does. Why we made it to the end?! Simply because we felt it was important to explain the whole process which meant that our application was a success. Then, we can consider that the Live Life is an application that runs on our computer and which collects all the files that we exchanged in our social network. With it, we study names of users, data exchanges. Advantages? Are numerous...

KEYWORDS

Personal information, visual information, user interface, inter-related information, graphic interaction.
INTRO

With the substantial growth of technologies, the number of users began to increase and their requirements. Sending an email, speaking in chats and interacting in social networks like hi5 or Facebook are normal activities of much of the population in the world. Belonging with the growth of these technologies, also the requirements from users began to emerge.

Questions like which files users had exchanged, when and whom began to be placed and to be the subject of several study. However, we can see through an deep analysis by the actual works that due to the volume of these social relations and even false social relationships (i.e. those that are created through a simple click on the mouse but "die" right there without any kind of development) becomes complicated previewing or even showing all this information to the user.

To verify this gap, we found that it would be important to find a solution to solve such situation. We realized that it was necessary to bring this added value to the "I.T." world. It was at this moment that we realized we wanted to create the LiveLife, a solution for data visualization based on social networks whose layout was attractive, simple, fast and effective.

For our work development, we have created a process consisting of several stages. We began by analyzing the most relevant articles that we felt more important about the subject. We saw the advantages and disadvantages of each method and thus we choose all positive aspects of each one to implement them in our application.

Then, we developed a prototype whit the propose to realize what the best type of interface for our solution. Then, already finished this phase, we left for the final the validation of Life Live.

We have chosen our main objectives, demonstrate the Live Life usability, efficiency and usefulness. We split the analysis into two phases: the first by performing a set of simple tasks but which we thought being used often by the user of our solution, the second through a set of questions regarding the understanding of graphics, datagrid, among others.

RELATED WORK

As already mentioned earlier in this document, the first part that contributed to the development of our solution was the analysis of various works. After reading several articles we conclude, in general terms, the following:

Visualization through Graphs

Advantages

-This form of visualization is ideal for small and low-density social networks;
-Is easy for user to understand it and accepted it;
-Enables quick identification of critical points, i.e. people who serve as “interface” to other subgroups;

Disadvantages

-Impractical for large and dense social networks;
-Is not simple find relevant information e.g. frequency and type of relations;
-It is difficult to apply statistical actions;

Visualization through Matrix

Advantages

-This form of visualization is ideal for large and dense social networks, although it is also applied in smaller networks;
-Enables quick and comfortable analysis in individual cases;
-The statistical study of information is more accessible;

Disadvantages

-In certain situations your query can become chaotic;
- Is fairly complicated infer subgroups or common points of connection;

**Visualization through other solutions**

**Advantages**

- Alternative approach of visualizations;
- Temporal dimension present;
- Faster detection of patterns;
- It is possible to reconcile performance requirements and magnitude of data in a harmonious way;
- The application queries and analyses statistics is also possible;

**Disadvantages**

- Is different from the usual solutions which can cause some initial discomfort to users.

After examination of each of these paradigms, which we balance the advantages and disadvantages of each, we have the ability to propose a different approach from all others and that.

**THE SOLUTION**

With this work, we want to develop a system able to first collect information about user interactions and subsequently find a method of compressing and view this data.

In order to develop an application responsible for show personal information, it is required a set of modules that make the management and proper treatment of this same information. Modules that know how to search and indexing this information, modules that allow this information to be analyzed and modules that know how to show these data.

Our solution is divided into three main phases:

- gathering information
- information management
- information visualization

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**Figure 1 – Tree tier architecture**

**Gathering information**

Let's begin by the module responsible for search and indexing information.

We chose to use the scribe which is a component that is not new because has already been imported from previous work. The Scribe is a search engine, developed in Python 2.6, which analyzes the personal computer, looking for relevant information. The information collected by this tool is then stored in a knowledge data base.

This gives us a new mechanism for indexing files, obtained through a massive search on your personal computer. By the way the information is indexed, is allowed to do heavy queries, with a minor temporal level cost. This is achieved through a system of reverse indexing of files and also the use of foreign keys that correlate information audited.
Information management

The Information management module will allow us to do the interface between the knowledge database and the application interface. Let us present a high-level view of this module and the several components that make up.

Figure 2 – Information management module main view

It consists of a Web server responsible for making the management of requests coming from the Interface, and keep up-to-date a cache to optimize the response times of the application.

To help the Web server, we have a module responsible for constructing XML's that will provide the data to the interface. The choice of XML was not innocent, since it is a canonical model currently used in several applications.

Information visualization

In this layer we tried that the user had the capability to easily analyze the data he want in an visually attractive, simple, fast and effective interface.

We have created two distinct modules: the first, the themes and users, associate files and allows us to do a qualitative analysis of information; the second, consisting of a graph points, allows us to understand how social networks evolve contacts giving us, therefore, a more quantitative analysis.

User & Themes View

Figure 3 – User & Theme View

Once in this module we wanted to study the information in quantitative terms we incorporate in this view a chart that shows us the amount of people with whom it interacts per unit time.

We added also a DataGrid, which associates each user the files created by it.

Is the union of these two components that make the main core of the User & Themes View.

Graph points View

Figure 4 – User & Theme View

In this module we want to study in detail the evolution of the relationship of the user with the exterior. In this view the main component is a graphic point which its led's high to inform that occurred and interaction in a specific gap of time, usually months.
Other components

To help the other components of the two views described before, we introduce on the interface other components, which are always visible and help the user to consult, interact and configure the information.

![Figure 5 – Auxiliary components](image)

EVALUATION

Despite all the confidence that we have on our system, referring on objectives that we initially achieve, we submit our solution to a sample of users in order to properly validate our solution.

To force the veracity and credibility of Live Life, we define a group of tests. Thus, the elements that constitute our sample have several variables ages, giving special focus to the age of 20/30 years. Most of the users usually use the computer, with a connection to the Internet and generally share files either by e-mail or via Internet downloads.

We create a set of tasks for users to submit that, through its results, we can evaluate the following characteristics:

- Usability;
- Efficiency;
- Utility.

In order to accurately assess the functioning and effectiveness of our solution, we produced six tasks with different degrees of complexity but typical tasks. These tasks focused on a database previously built and ideal formed for the tests in question.

Then, the same users answered questions relying on the thematic satisfaction of our interface.

Let’s present in detail each task provided to the test user:

Task 1 - Browse the Live Life using the range of dates already set

This task was drafted with the aim to serve as a first approach to the user. The requested action was simple, just click the button “Start Exploring” opening then the main screen of the application that already contained the data relative to the range request (1 September 2008 to 31 March 2009).

Task 2 - With the range given previously, identify which the month had the greatest activity and the one who had the least.

When entering in the main part of our application, the user is bombarded with several Visual information. So it was important to focus on certain aspects of Life Live interface. Therefore this task had as main objective to focus the attention of the user in the chart of interaction with users (most visible and predominant element of the interface). The user had to find in the abscissa of the graph the month corresponding to the highest ordered visible chart which, in this case.

Task 3 - With the range given previously, identify the user name with which shared more files, indicating also the total number of files.

Ending the chart analysis, it was necessary to study others elements visible in our application: the datagrid people/files and the information panel. The first makes the
association between people and files, i.e. identifies which files associated with each user. Here we can see e.g. which files the X element created and whether they are present in our computer. The second element shows in detail, some information about the elements in the study. Here you can view the total number of files associated with this element, the date of the last file exchanged, the detail of received files, among others. This task could be considered a little difficult because who does the test just had to make the holding of two interacting components. In addition, the answer was not immediately visible, i.e. the user was required to go through and analyze carefully the information present in datagrid people/files to withdraw information that wanted to get.

Task 4 - On previous detected user, which months with that kept contact.

The three previous tasks concentrated its attention on first view of Live Life. However, as already mentioned several times, our application has another interface where you can analyze in detail the relationship of user along time. The aim of this fourth test this quality. To get the answer to the challenge request, the user had to have the ability to switch to graph Points, and then consult the list to identify the response.

Task 5 - Indicate the month of greater activity between 2008 and 2010

The main purpose of this fifth task was to enable users to navigate through the application, in particular in the graph in order to find peak months of activity. To reach the desired response, the test group had two options for its resolution: direct navigation in the graph or change the date range. It is important to remind that this second method wasn't originally provided and was optimized by suggestion from two users who performed pre-testing.

Task 6 - Identify the users with which kept contact in December 2008

To finish the tasks, it was chosen one which only required a careful examination of the information provided by the chart points. The user had simply to consult the point chart, and ensure that had the month December 2008 within his lag.

At the end of the user tests, we had obtained the following results.

![Task Results](image)

**Figure 6 - Test Results**

Generally, through the results obtained, we can consider that the objectives of our application have been satisfactorily achieved. The indicators have shown us that we got good indexes for usability, usefulness and efficiency.

We also note that most readers were able to accomplish the tasks without great difficulty. Except for one of the respondents, all they accounted to what was expected at this stage of Live Live.

However, this test users also made us realize that there are gaps in our application that could be improved.

We realize, too, that is very important this kind of work contain a total control of the time, because, in order to analyze the relationship in a correct and complete way,
it is necessary that the user has the possibility to change the gap interval at any time.

CONCLUSION

We conclude that all the work developed on this solution was to satisfy the demands of users on this new technological age and also contributing to the study of new solutions on the data visualization of social networks and even that this work could serve as a basis for many other developed in the future.

We have no doubt in stating that the Live Life is an innovative, simple, fast and effective solution for any user who, whether for work or laser, might want to analyze their social networks.

Despite everything, through feedback that our users test gave to us at the stage of investigation, we have detected that this project can still be improved, essentially into two components: the collection and management of information and information visualization.

There for, reviewing one of the first suggestions, we believe that the level of information collection, the progress of future related work based on our approach should tend to collect more varied information.

We also consider important made developments or enhancements at system cache and query information. Being this collection & information management, GUIs platform, all optimizations made here, will have great effects at the level of the bed.

Still, we believe that this theme would implement a tool, that analyzing the sharing of files or e-mail, to collect information other than personal, i.e. through e-mail forwarding, or shared files, can discover contact information present in the social networking in study.

Passing to the analysis of the optimization of our second suggested component, information visualization, we believe that the future lies on the inclusion and exploitation of new features that allow better deduction of operating standards and yet the quality and quantity of information to be provided.

Our users also suggested the introduction of color scales, associated with the intensity of communication. The same idea can also be applied for file types.

Finally, we suggest that also can be a technological level optimization on the improvement of the graphic processing times.

As we were checking throughout the development of the Live Life, this application is an approach very focused on usability and any improvements to this level would be considered a very useful development.

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