



Project acronym: **Go-myLife**

Project full title: **Going on line: my social Life**

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## **D2.4 Technical Requirements' Analysis**

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**Abstract**

This document covers the basic features that are needed within an online social network and all the extra features that Go-myLife will implement. It also includes an analysis of how Go-myLife could connect to other social networks. This second release includes the end user needs and requirements defined during WP2 workshops (based on deliverable D2.3). Also it contains an analysis of all the possible software engines that could be used for the development of the platform, as well as the usability requirements for proper operation.

**Keywords**

Technical requirements analysis, geolocation, LibreGeoSocial, social network, usability, architectural specification.

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## 1 Objectives

The objective of this document is to describe the basic requirements needed for creating a standardized social network that complies with all the features listed for Go-myLife. This document also includes some examples of social networks that will probably be used in developing the Go-myLife project.

This second release analyses the results from all the WP2 workshops up to that date and provide an analysis and compilation of those findings.

## 2 Functionalities expected from a social network

This chapter will explain all the functionalities used generally in social networks that will be included in the Go-myLife platform.

### Methodological approach

Popular online social networks were reviewed for that purpose and are presented in the following sections. Table 1 summarizes the most popular social networks in terms of registered users and popularity, based on each network statistics.

Name	Registered Users	Description
<i>Facebook</i>	800.000.000+	General
<i>Twitter</i>	175.000.000+	General, RSS updates, micro blogging
<i>LinkedIn</i>	120.000.000+	Business and professional networking
<i>MySpace</i>	100.000.000	General
<i>Google+</i>	60.000.000+	General

Table 1 Online social networks summary

Those online social networking platforms were examined in detail, in order to understand how they manage the following procedures:

- Create a new profile
- Privacy settings
- Connect with new friends
- Upload media / Share content
- Groups creation
- Messaging functionalities
- Content APIs, tools and services

## 2.1 Profile creation

Social networks provide different kinds of profiles. Some of them allow the users to describe themselves, their interests, friends, favourite music, books and photographs.

Some social networks let your friends listen to a song when they visit your profile to show your contacts your current favourite music. Other networks let the user change the design, colours, shape, font type and background image, and even more features.

The aim of all social networks is for their members to be ready to share information from the very beginning. In order to do this they need to make the process of setting a picture or a video to your profile as easy as possible; most of them allow a web cam to be used for this purpose.

In general all social networks show one or more profile pictures and increasingly it is becoming common to display a presentation video. In fact some social networks are video based.

The profile often also displays the groups to which the user belongs. This makes it easier to interact with other users of these groups.

Examining the following figures, an outline of the new profile creation process on different online social networks is shown:

### Facebook



Figure 1. Facebook – Main page



Figure 2. Facebook – Second step account creation

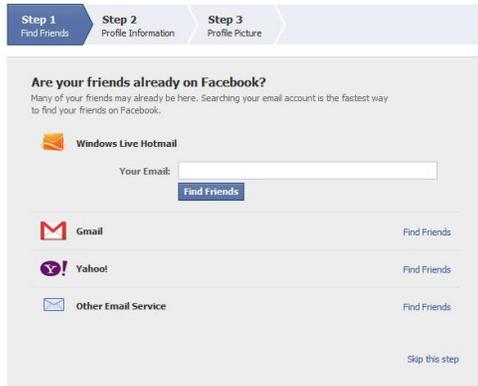


Figure 3. Facebook – Search friend upon sign up



Figure 4. Facebook – Provide personal info



Figure 5. Facebook – Upload photo

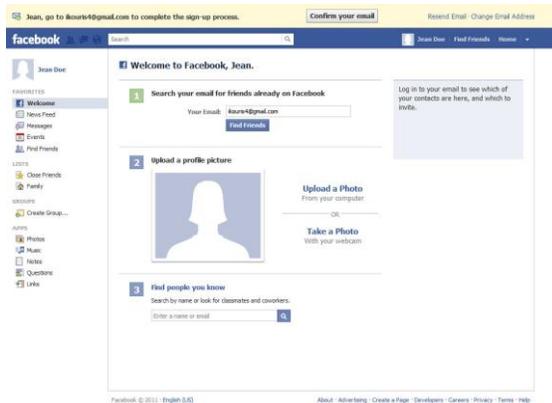


Figure 6. Facebook – User profile page

*Remarks:*

- Facebook includes sign up process from the main page
- It has a two step sign up process
- It allows the user to search friends using email contacts
- Prompts the user to upload a photo or take a snapshot using a web camera
- On first login prompt the user to verify the email account used during sign up process

# Twitter



Figure 7. Twitter – Main page

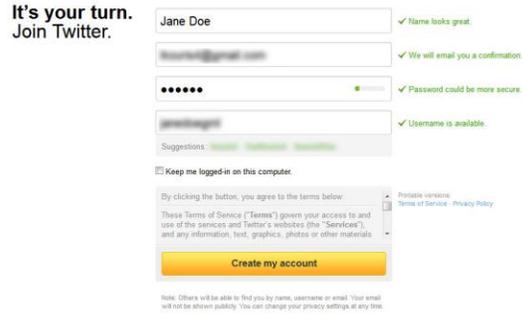


Figure 8. Twitter – Second step account activation

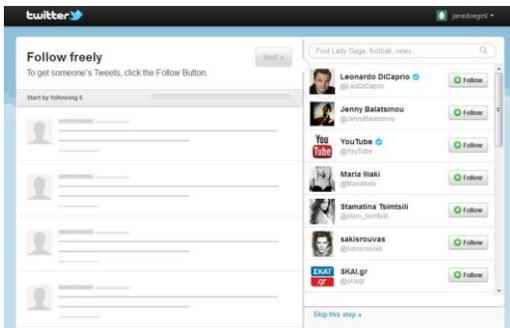


Figure 9. Twitter – Add following tweeter during sign up process

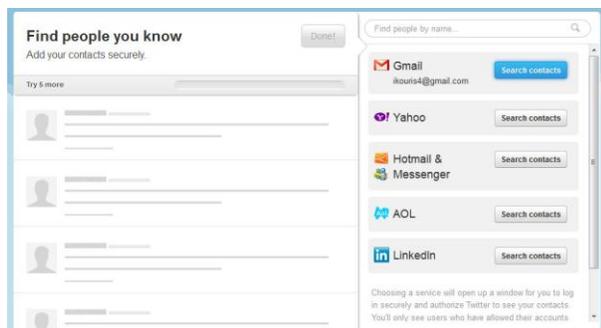


Figure 10. Twitter – Search tweeters using email contacts and other online social networks

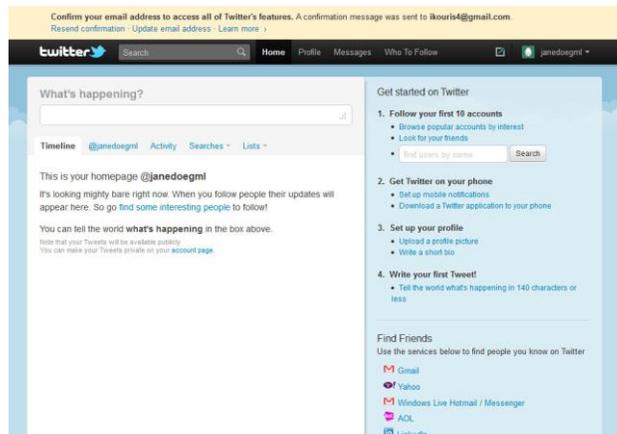


Figure 11. Twitter - User page

**Remarks:**

- Twitter allows sign up from the main page
- It has a two step sign up process, asking little personal information

- It allows the user to search friends using email contacts and other online social networking accounts
- On first login, the user is prompted to verify the email account used during sign up

## LinkedIn

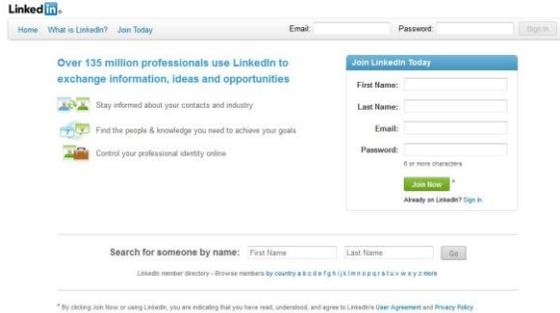


Figure 12. LinkedIn – Main page

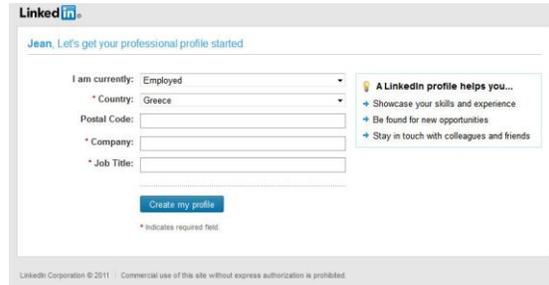


Figure 13. LinkedIn – Sign up page

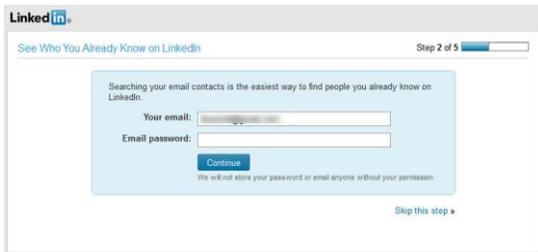


Figure 14. LinkedIn – Search contacts

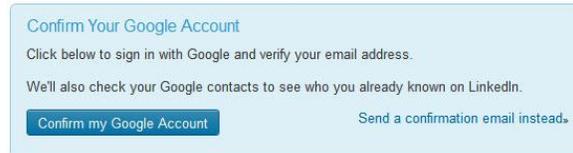


Figure 15. LinkedIn – Account verification

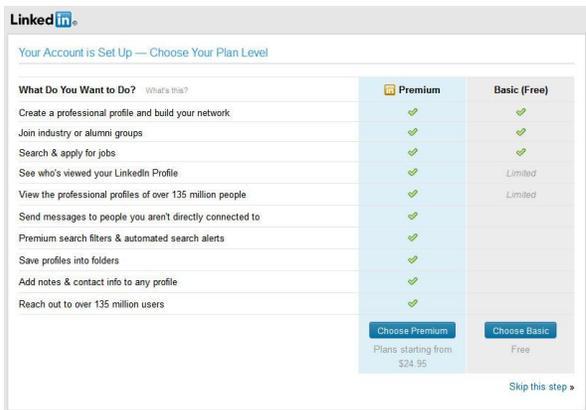


Figure 16. LinkedIn - Paid service options

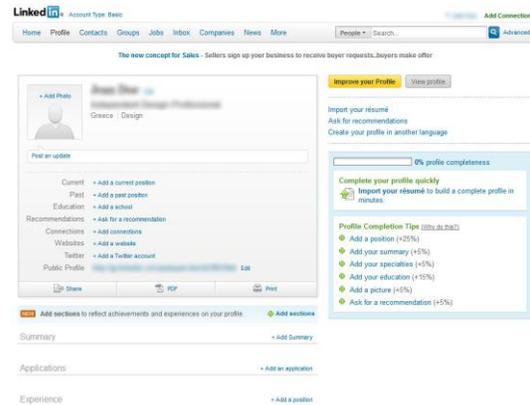


Figure 17. LinkedIn – User profile page

### Remarks:

- LinkedIn allows sign up from the main page

- Sign up process requests different info from the user, depending on the professional status
- Connections search can be performed using email account contacts
- Account verification can be done using Gmail or Yahoo! ID, or via email
- Paid services are offered for improved features
- User profile page offers various additional information the user may add. A progress bar indicates profile completeness

## MySpace

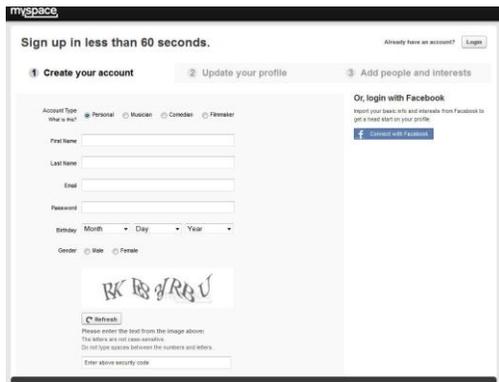


Figure 18. MySpace – Sign up page

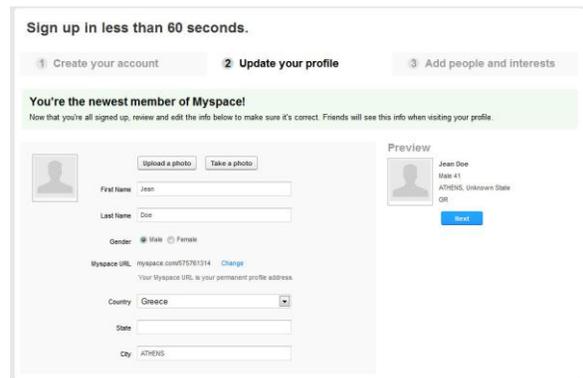


Figure 19. MySpace – Add personal info

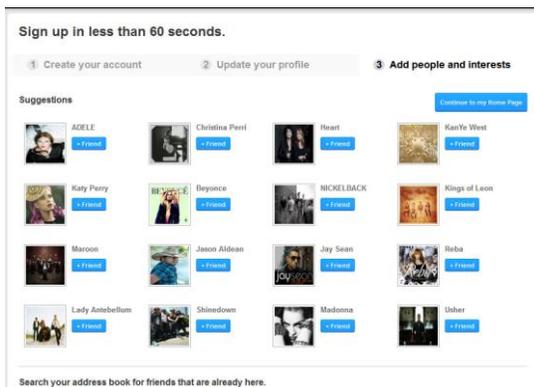


Figure 20. MySpace – Add people

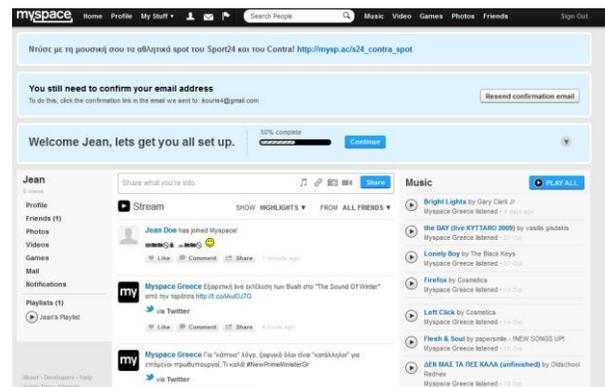


Figure 21. MySpace – Profile page

### Remarks:

- MySpace allows sign up from the main page
- Sign up may be done using MySpace account creation or the user may login using a Facebook account
- The user may add personal info and upload or take a photo during sign up process
- Contacts may be added searching email account contacts

- The user profile page demands email address confirmation on first login
- A progress bar indicating information provided is shown

## Google+

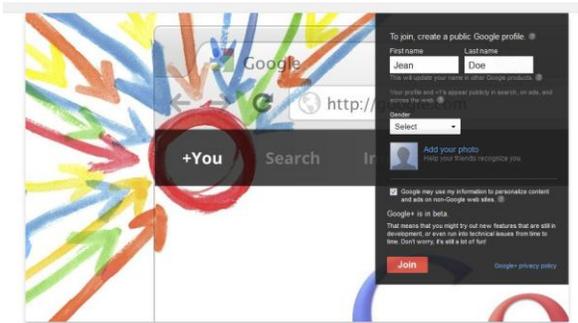


Figure 22. Google+ - Sign in page

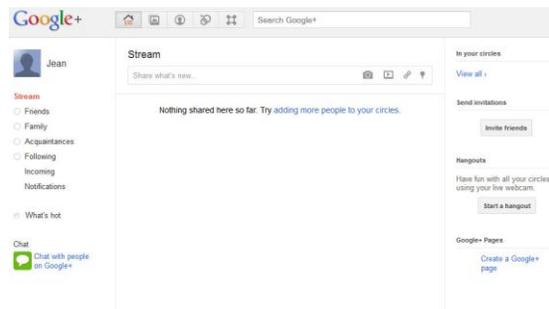


Figure 23. Google+ - Main profile page

### Remarks:

- The user signs in using his/her Google ID

In the following table, the main characteristics of the examined online social networks are summarized.

Name	Add photo during account creation	Search email contacts	Sign in using other ID	Paid services	Email confirmation
<i>Facebook</i>	✓	✓	✗	✗	✓
<i>Twitter</i>	✗	✓	✗	✗	✓
<i>LinkedIn</i>	✗	✓	✓	✗	✓
<i>MySpace</i>	✓	✓	✓	✓	✓
<i>Google+</i>	✗	✓	✗	✗	✗

Table 2 Main characteristics of examined online social networks

All the online social networks examined allow the user to add more personal / professional information after the initial account creation. The user may choose what kind of information will disclosure. The profiles may show personal information such as birthday, place of birth, current location, groups, interests, etc.

## 2.2 Privacy settings

The user may change his privacy settings using the appropriate menus of each online social network. Although, not all online social networks provide privacy settings

<i>Facebook</i>	<i>Twitter</i>	<i>LinkedIn</i>	<i>MySpace</i>	<i>Google+</i>
✓	✗	✓	✓	✓

Table 3 Comparative online social networks that provide privacy settings

Each of the online social network platforms that support privacy settings allow the definition of what kind of information will be visible to the public or to specific groups. Google+ and Facebook allow more complex settings to be defined for each group individually. Some of the information that are selected as visible or not include the following:

- No one has access to the content except for the user
- Only specific friends selected by the user have access to the content
- Specific groups of people, e.g. “family” or “co-workers”, are allowed to access the content
- All of the user’s friends have access to the content
- All of the user’s friends along with their friends can access the content
- Everyone who is logged in the social network has access to the content
- Everyone has access, even if they are not members of the social network

## 2.3 Connect with new friends

Finding friends, family members, or other people that the user knows is an essential part of the functionality of any social network. There are various methods and tools that the social networks provide to help their users to find friends and family members.

The first and simplest method is to find a person who is a member of the same social network. To find a friend or family member within the social network, the user can first try to search using the full name of the person. Then by looking at the profiles of the resulting users he or she could identify the person they are trying to find. Other search criteria can also be used such as email address, the name of the company where the person works, the name of the school or university that the person is attending or has graduated from, their hometown, current city or the name of a mutual friend.

Another option is to use information from other social networks or services. A feature provided by most social networks is to import contacts from the user’s profile on another social network or service, for example from a Yahoo!, Hotmail, Skype or Gmail account. The user authorizes the social network to retrieve contact information such as email

addresses and names from the user's contacts list or friends list from the other social network or service, which is then used to search for existing users on the social network.

The user can also directly enter the email address of a friend to invite him or her to join the social network.

Finally there are sites which are not social networks but allow searching for information about a person across several social networks or even from other sources of information such as online databases.

In all of the above cases, most social networks require that the person should first accept the user's request before being added to the user's friends list.

## **2.4 Upload media / Share content**

The most common features among the online social engines include a section where the user posts news and updates, a section to post photos or videos (media) and a section to exchange messages (privately). The media can either be uploaded as files transferred from a desktop or portable computer or may be photos and videos captured via mobile devices and uploaded directly to the network. Media content may be organized in albums and titles and descriptions may also be added, along with the date and the location of the capture. In case the media content has geolocation information, a map may display the places where they have been taken. During media uploading, the user selects whether the media will be publicly available or if only specific groups of people will have access on them.

Sharing content online has been a very common practice for many years, ever since the email became popular. Apart from email, which still is one of the most popular methods to share content with other people, social networks provide today a much wider variety of methods to share content. Content can be anything from personal thoughts, photos, videos, or existing online content publicly available.

Personal content is usually posted or uploaded to the user's profile on the social network. The user has various options regarding the visibility of the content allowing him or her to define whether the content can be accessed by everyone, by other members of the social network or only by specific friends.

Existing online content, such as a blog post, a web page or an online video, can be shared by sending the URL of the content resource to selected people or by storing the URL to the user's profile on a social network that the user belongs to. This function is provided by special buttons embedded on the page of the content provider which allow the user to share the URL of the content resource by logging into a social network or even through email.

### **2.4.1 Sharing content from within the social network**

The first option for sharing content using a social network is from within the social network itself. The user has logged in to a specific social network and posts some content to be shared. Depending on the features provided by the social network, the user may write a short message, a long article, upload a photo or video or enter a link to a web page. Also the user may set the privacy options for the content he or she is posting.

Similarly the user can share content from other people within the same social network by pressing a button on the page which posts a link to the content as a message in the user's profile.

A variation of this is when the site supports editing of the content by other people who are given the appropriate permissions by the user. In this case the user shares the content and invites friends to contribute to the content if they wish.

Some sites can provide access to the content by creating a special access token which can be sent through email to users who are not members of the social network.

## 2.4.2 Sharing content from within another application or site

Another way for sharing content is through an application or site outside the social network that the user is member of. One example is an application running on a smartphone device or on a computer desktop which allows its user to share a photo or message through various social networks. The user selects his or her social network, authenticates against the social network and authorizes the application to post the content.

This functionality can be also available from a web site, whether it is a social network or not. For example a user can share a blog post he or she has written or an online photo album through his social network by pressing a special button on the page, if the site supports posting content to the specific social network. In this case the site posts a URL of the online resource to the user's profile on the social network.

A similar case is when the user shares content which is created by someone else. The user views some content on a web page and chooses to share the content with other people through her/his social network. Again a special button is hosted on the page which allows the site to send an email with the URL of the content resource or post the URL on behalf of the user and with the user's authorization.



Figure 24. Sharing content from within another web site or application

## 2.5 Groups creation

Users demand a section of the social network to be used for sharing messages, photographs, videos, forums and opinions among groups of people who share specific common interests. Some social networks have different kinds of groups, depending on the privacy or security. Some allow hidden groups, private, public, and other kinds of groups. In general users create groups for sharing their particular interest, based on hobbies, music, books, politics, sports and a wide variety of topics. Sometimes the main element is not just text; it can also be images, music, video or even web games.

Facebook has recently added a new feature for groups to allow them to gather statistics about visitors and clicks on news of the group. Twitter itself does not allow the creation of groups, but several applications such as Tweetworks or Twibes allow users to communicate with other users with similar interests and in a similar way as in other Social Networks. The following is an example of group on Facebook, where the most important aspects are the opinions, suggestions and forums that users post into the group.



Figure 25. Facebook groups

## 2.6 Messaging

Most of the online social networks offer various types of message exchange between the users. They are grouped into:

**Status messages:** This type of message is shown on the top of user's profile news feed. Some social networks do not include this type of messages because they are not aimed at communicating via news feed messages.

**News feed messages:** This is a public way of communication between users. One user writes a message on the news feed of other user and everybody can see that message. Depending on the security, other users can even reply to that comment, or write another

comment related to it. Not all the social networks contain a news feed in order to post comments.

Private messages: Social networks allow users to interact with other users on a one-to-one basis. This functionality is similar to the classic e-mail. The messaging mechanism send notifications with the content of the private message.

Group messages: The social networks that allow the creation of groups also support message exchange between the members of the group.

Instant messages and video chat: Facebook, Google+ and MySpace offer instant messaging function for users to chat with each other. Additionally, Facebook and Google+ also support video chat.

## **2.7 Content sharing APIs, services and tools**

In order to implement the content sharing functionality, social networking sites expose services which receive information about the content to be shared from other sites and applications. They also provide documented APIs (Application Programming Interface) and tools that other applications and sites can use to post content and URLs to a user's profile.

There are also services which provide sharing functionality for multiple social networks. These services provide tools, such as html buttons, which can be used by content providers within their sites to implement sharing functionality for multiple sites without the need to implement and maintain the integration of their site with each social network and their APIs. Some examples of the most popular URL sharing services are *AddThis*, *AddToAny* and *ShareThis* which provide buttons that can be embedded on web pages, as the ones shown below.

OExchange is a simple specification for URL-based content sharing. It establishes a common way for services such as social networks to receive content. It also defines how third-party tools can dynamically discover and share content to these services, allowing them to support new services that may appear. Finally it defines how sharing tools can read and set a user's sharing preferences.

OExchange is trying to solve the problem of having to integrate with several content sharing services independently using different ad-hoc APIs each time. OExchange makes it possible to share any URL-based content with any service on the web.

### 3 Functionalities expected from Go-myLife

The Go-myLife platform will contain some functionality that is not common in other social networks, which will add extra value to the project.

#### 3.1 User friendly interface for elderly people

Designing a website for elderly people can be challenging, because mainstream forms are often not user-friendly for older people. A study by Webcredible identifies the problems associated with the older users<sup>1</sup> and some of them are presented below:

1. Many older users have problems with scrolling down a lengthy webpage
2. Older users tend to find it difficult to understand technical language (E.g. terminology such as Browser, Homepage, Link, Tab etc).
3. The aforementioned research showed that older participants clicked on places on the web page that were not links. It is clear that they find the current link model challenging.
4. Elderly people tend to have an aversion to downloading, which is based on the fear of viruses and other possible threats for their computer.
5. Older users prefer websites that make strong use of a good search technology and they think that this is one of the best features of a website.

The above facts lead to some ideas concerning a proper design methodology for the web platforms oriented to older people, which are analysed below:

The Go-myLife platform must be based on single page views that have fixed size and keep the amount of scrolling needed to a minimum.

Terms such as Homepage, link etc. must be replaced with other non-technical oriented ones. Go-myLife should use vocabulary which is used in normal everyday life which may be thought of as simple and clear.

The Go-myLife website should ideally be built on modern HTML5 technologies in order to avoid the need for extra plugins and extra programs and also in order to make it easier for it to run on every mobile device.

A generic search function is needed that groups the search results into similar content e.g. Family and Friends, Places, Events etc. This search function must be one of the basic features of the website.

The colours must be bright and the font size easily adjustable in order to help older users that feel uncomfortable with the default user interface (UI) settings<sup>2</sup>.

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<sup>1</sup> <http://www.usabilitynews.com/news/article2911.asp>

<sup>2</sup> <http://www-module.cs.york.ac.uk/wed/notes/materials/webcredible-handbook.pdf>

The UI must be based on large distinctive icons and general views that provide the amount of information needed in the best way for older users.

### **3.2 Mobile interface**

The mobile version of the Go-myLife platform must be based on the same design principles that the website is also based on (chapter 3.1). Hence some points that must be emphasized are:

- The UI must be based on large icons with high contrast. These icons should represent each action, data type or event that the user can interact with. Also the fonts must be large in size and very clear. Specific font families must be preferred over others.
- The UI should make use of the great capabilities of a modern smartphone platform when it comes to the touch-based user interaction and it should require the minimum amount possible of data entry using the traditional touch screen keyboard that most people (and especially older ones) find difficult to use.
- A really important enhancement to the system in the medium term would be the use of speech recognition that would make it really easy for the users to interact with the Go-myLife mobile application and accomplish the most common tasks.

### 3.3 Connection to other social networks

The reality is that most older people don't have an account with any of the mainstream social networks. However, this shouldn't be a barrier to interacting with their friends and family who already have such an account. Go-myLife aims to facilitate this interaction.

A user of Go-myLife needs to be able to see what their Go-myLife contacts are doing in other social networks and interact with this content in an easy and seamless way.

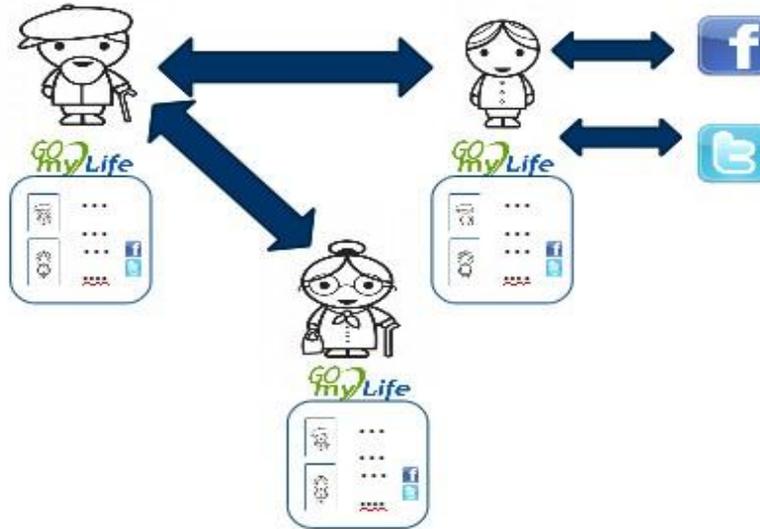


Figure 26. Use case example

From the Go-MyLife platform a user who doesn't have an account in an external social networks needs to be able to:

- View the status and comments of their friends in other social networks
- View the content shared by their friends in other social networks (photos, videos, notes...)

The user will need to be able to respond to, comment on, and interact with this content through the Go-myLife platform. How these replies will appear in the external social networks will depend on the APIs that they offer.

A user with accounts in other social networks should also be able interact with them through the Go-myLife platform. Some of the functionalities could be:

- Upload their status / Make comments
- Share content
- Send messages
- Find friends

These functionalities will be defined by whatever limitations might be imposed by the public APIs of these social networks.

### **3.4 GeoLocation**

Go-myLife will be a platform that provides contextual awareness regarding who and what is around the user. The Go-myLife platform aims to enable the location of the users to be tracked and the geolocated information to be stored for the different types of content.

Users will be able to know which of their contacts are nearby. This will give older people more security and break the isolation; allowing spontaneous meeting up. Contents (photos, videos...) can also be tagged regarding a specific geographic location, so a user can see interesting information around him or her, and have the possibility of adding new content or making comments. This will support collaboration and interaction among users.

## 4 Functionalities to meet the end user requirements

This section will describe the functionalities indicated by the end user needs and requirements collected during WP2 user-involvement workshops. All information in this chapter is based on the deliverable “D2.3 Synthesis Report on target group analysis and user needs and requirements” which has been transformed into technical terms.

### 4.1 Groups

According to the research conducted in deliverable D2.3, groups seem to be a highly valued feature for interaction. One example is in the social network 50plusnet.nl, where 11,000 different groups (such as bicycling, walking, theatre or cinema, going out to the restaurant together) are set up:

*“Lots of the members use the platform to arrange activities in real life. They also exchange telephone numbers to make arrangements in real life. People can make one-to-one appointments or join one of the hundreds of groups that have been established by the members of the site.”* (Interview with 50plusnet.nl operator)

#### 4.1.1 Forums

Forums are groups where the users can discuss different themes expressing their thoughts and feelings. As privacy and security issues are of high relevance for older people and workshop participants reported their increasing reluctance to communicate via the news feed with people they don't know as they get older, functions that would enable messages to be left anonymously in forums are highly recommended. The user should be able to decide individually if she/he wants to join the discussion within a group anonymously or fully authenticated.

#### 4.1.2 Local communities

Another kind of group that is highly appreciated by the senior citizen's and will be implemented in this project are local communities. Local communities are groups created by the user or association and that are relevant to their local community and neighbours. One good example of local community based social networks is Yatown (yatown.com).

In Go-myLife this type of group will be called Local Life.

Local Life groups should be either manually defined by the user, or they should be automatically suggested by the platform, based on either the location the user has defined (e.g. home address) or retrieved by the geolocation information which is detected by the browser or the mobile device used to access the platform.

The information on these kinds of groups has the purpose of putting a "focus" on a comprehensible and delimited area of life, which is perceived by many people as something positive, especially amongst the older ones.

For more information about Groups, please refer to chapter 2.6.

## **4.2 Friends groups**

Generally, in Social Networks users tend to have a considerable number of friends. This normally makes the administration of “friends” difficult. One easy way of organizing them is to create interest groups, such as “Family” or “Travel friends”.

In addition to the possibility of creating friends and interest groups, end-users suggested that it would be useful to be able to create subgroups, making it easier to identify their different friends. One example of this could be a group “Travel friends” with the subgroup “Hiking friends”.

Another example of the importance of creating friends groups is the possibility to share information with a specific group of users. If the user wants to share something only with his or her family, they can select the “Family” group and share it.

## **4.3 Platform usability, structure and layout**

What motivates older people using social networks are their social needs; connecting to family or old friends, showing their achievements or comparing themselves to their peer group, finding people with similar interests, joining groups or just entertainment themselves.

However, older people are prone to having a negative perception of ICT due to general worries about technology or the excessive amount of effort required to learn to use it. They consider this perception of complexity as their own fault instead of a failure in the design. For this reason, the motto “Simple as possible” takes a relevant role in the design of a senior platform. In other words, it must be simple, easy to use, well-structured, consistent and not overwhelming.

The feedback collected from users during the workshops indicated that each page should only contain a small amount of information, in order not to confuse them. The participants had the chance to examine multiple layout designs and the majority of them suggested that an appealing layout and attractive design are the key factors that would make them use it regularly. The terms to be used should be familiar to a non-technical person, such as older people. Facebook is a good example of the use of familiar terms to describe functionalities.

The navigation of the platform has to be simple, clear and logically structured, to avoid confusion. Breadcrumb navigation (see Figure 7) and a “backward” button in every page should be used by the platform to help users track their actions. The breadcrumb navigation tree is an important foundation. Good best practices of social networking platforms (such as Finerday.com) use this type of navigation and additionally each function and service is marked with a separate colour to enhance memorability and intuitiveness.

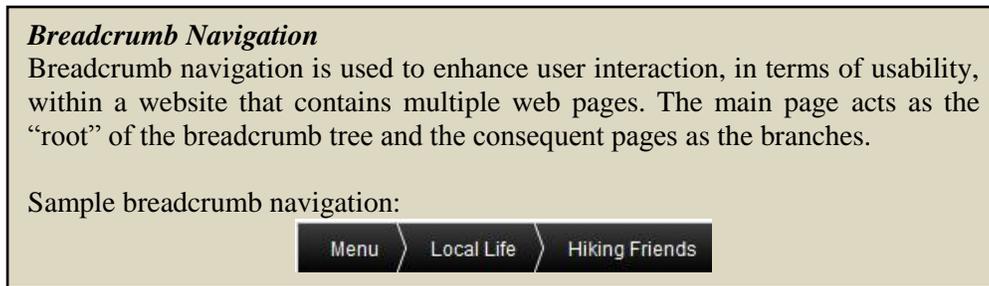


Figure 27. Breadcrumb navigation

The presence of a mechanism to inform the users of the consequences of their actions is important so that they can see that their action has been successful. It is also important that a preview of the results of their actions is included, acting as a feedback mode. These two steps will enable the older person, who is not aware of what the results of their actions will be, to both to preview the result and then receive feedback as to whether the action they intended to perform has been successful or not.

Reliable search outcomes are crucial in order to avoid any discouragements. Search tools that provide support for finding a determinate item are highly appreciated. In the second iteration of the Go-myLife platform, we’ll investigate the search engine in greater depth, to ensure that it will offer significant and relevant results to the user. Search functions must also include search based on location.

An intuitive mechanism for allowing sorting (e.g. of news or info) should be implemented. Sorting by date, topic or author was discovered to be very important for older people, along with the display of the most recent news on the top of each page.

As indicated before, the platform should be simple, easy to use and navigate, and the use of distracting images or banners should be avoided. Because of this, no pop-up advertisements will be displayed, the usage of flash will be omitted and the layout will be as simple as possible.

Navigation icons and placement should not be changed, because this irritates the users and causes confusion. The font size should be adjustable by the user and large fonts should be the predefined selection. The content of each page should be fitted within the screen size, avoiding the need for scroll-down. Whenever possible, all the information should be displayed on one page (keeping the content / over information balance in mind). In other words: the scroll-down should be transformed to a “book-like” layout, because old people find it easier to use the platform like a book and “turn” their pages to navigate.

The ideal Social Network is absolutely safe, making it impossible for any information to be retrieved by outsiders. Users need to be able to control the sharing options and these must be displayed in an easily discoverable and understandable way. For example, most of the users in WP2 found Facebook privacy settings too complicated to define or even to find.

Users appreciate good platform administration as it guarantees a secure communication environment. Setting up a number of moderated groups to help people provide support to each other is recommended. Help can also come from explanatory videos and text that

guide the user step-by- step through the platform and explain how to use the different functionalities of Go-myLife (e.g. How to upload a photo). Instructions must be clear and “hints” must be used to give useful advice. While step-by-step instructions must be offered, there also needs to be the option of jumping these instructions to avoid wasting the time of ICT literate users.

Most of the features users appreciate in a social network such as uploading photos, messaging, events... will be covered by the first architecture design of Go-myLife. However, the findings in D2.3 identified a set of functionalities that are highly appreciated by elderly people and will be considered for the second iteration of Go-myLife architecture:

- Match-making feature: Many users feel alone and join the social networks with the desire of finding people with similar interests and affinity. This matching tool can also be extended to suggest interesting groups or local associations.
- Bulletin board / Forums: Users are predominantly active when it comes to share opinions, activities, jokes and stories, discussing e.g. meals, theatre trips and others, to provide support and advice and companionship.
- Birthdays reminders are also considered positive.

Features that can be neglected are voting and chat.

#### **4.4 Profile creation**

A point of criticism within the framework of the end-user workshops relates to the fact that during the creation process of a profile, Facebook asks its users for information that sometimes goes beyond the limits of individual feelings of privacy. Accordingly, a coping strategy often used is to fake certain information:

*“The profile is encouraging you to put private information on Facebook and in my family everyone found out about a certain person's birthday. My way of dealing with it is that even if I do have to fill in these things, I don't put the real information on it. (woman, UK)*

*“It does say profile picture but my picture is not my photo but a decorated egg that my grandson won in a competition.” (woman, UK)*

*“You see, I'm not using mine since it was set up.” (woman, UK)*

The registration and profile completion must be simple. Because many users don't like being required to provide a great deal of personal information, the majority of fields must be optional.

Creating and editing profiles is an important challenge and a potential barrier for older people in social networks. Therefore functions that facilitate the creation of personal profile pages are recommended. The senior platform 50plusnet.nl can be considered as a good practice example, where the creation of the user profile is based on a multiple-choice questionnaire, as people find it difficult to describe themselves without such help.

Therefore, in Go-myLife, the multiple choice questionnaire approach will be followed in the registration form.

## 5 Social networks connections and integration

It is important to decide which social networks and sharing sites will be connected to Go-myLife platform. Some of the most important social networks have limited outside access to them for security reasons. However some of these limitations maybe lifted in the future.

The API of each social network must be prepared to interact with the Go-myLife platform. If necessary, a module between Go-myLife and the Social Network (Facebook, Twitter, etc.) could be developed.

Go-myLife has evaluated (see D2.3) the potential of connecting to the most popular social networks and sharing sites listed below:

- Facebook: is the most popular social network nowadays. The multiple social tools (e.g. share of photos, events, posts...) have made it a very powerful social network. Its popularity makes it mandatory to provide a connection with Go-myLife.
- Twitter: has increased its popularity in the last years, becoming one of the most popular social networks due to its speed of communication. Famous people, celebrities, politics, associations, etc. have their own representation in it. It can be very useful for Go-myLife in order to be up-to-day with news of relatives or associations that the older person is part of.
- MySpace: has clearly positioned itself as a music-focused site for young people. There is therefore no need for Go-myLife to connect to it.
- LinkedIn: is very much a business social network, focused on providing people in business with access to job opportunities and with opportunities to network and create sales opportunities. It is therefore not relevant to Go-myLife.
- Youtube: is not a social network as such, as the main function of Youtube is to allow people to upload videos and others to watch them. But it could be useful for Go-myLife to allow users to upload their videos of relevant places and events around them to Youtube and to link to them on the Go-myLife platform.
- Panoramio: Like Youtube, is not a social network itself, but it can also provide photos related to specific places.
- Google+: this is a very recent development and has grown very rapidly – though it seems to have reached a plateau at the moment. However it has some features that might be very attractive to older users. For example it is very easy to set up groups or “circles” and to keep discussions going on within each circle clear and distinct from each other. It also makes it easy to set up video chat sessions for each of these different “circles”.

Along with some “senior” social networks, such as those listed below:

- 50plusNet : had been presented at the AAL Forum in 2009 and was considered a “best-practice” project. It is aimed at older people who wish to extend their social network it is especially good at online joint activities. They can easily share hobby’s and develop a social circle. The main objectives of 50plusnet ar prevent isolation amongst older people, stimulate activities participation and social involvement, encourage older people’s initiative and to promote a healthier lifestyle.
- FinerDay: focuses on the provision of a secure and private online networking space for families. It is also aimed at playing a key role for separated families in that it will allow grandparents to keep in touch with grandchildren even when the parents who have divorced/seperated.

However, these “senior” social networks, so far, don’t provide public API to develop connectors to them, so it is not possible to integrate their content inside Go-MyLife.

In our judgement, it will be necessary to create a specific interface, that matches Go-myLife with the most popular social network (i.e. Facebook) and another generic interface that matches the platform with the other social networks.

Some senior social networks will be also tested with these interfaces, because in the future it might be necessary to include them on the list of social networks that would have an interface with Go-myLife.

Once the interface is created, it will be compared with the desired interface and the differences will be evaluated in order to improve the quality of the interface.

Due to their popularity and their relevance for end-users and stakeholders, Go-MyLife will create a connection with Facebook and Twitter to share content between them and Go-MyLife. It will also integrate content from Panoramio and Youtube, showing relevant geolocated information around the user.

### ***5.1 Facebook – potential integration with Go-myLife***

Facebook is currently the most popular online social network with more than 750 million active users and more than 350 million active users accessing it through their mobile device. As a result, integration with Facebook is an important goal for Go-myLife.

Facebook supports all the functionalities described in chapter 2 along with others. Integration of Go-myLife with Facebook should cover as a minimum the following functions:

- When the user tries to find a friend or family member, Go-myLife should also search on Facebook
- The user should see updated content of their friends who have a Facebook account and be able to write comments about that content

- The user should be able to chat with or write a message to a friend or family member who has a Facebook account
- The user should be able to share her/his content with friends and family members who have a Facebook account
- The user should be able to join a group on Facebook or create a group through Go-myLife

## **5.2 Twitter – potential integration with Go-myLife**

One of the most successful social networks nowadays is Twitter, a micro-blogging service where users can send messages up to 140 characters called *tweets*. Users can subscribe to other users' *tweets*.

The integration of Go-myLife with Twitter will mean:

- A user with a Twitter account could see his or her own timeline (his or her own *tweets* and the *tweets* of the users that he or she follows). The user could have the possibility to *tweet* (post something), *retweet* (publish other's *tweet*) or *mention* (reply to other users) directly from Go-myLife. It could be interesting to add a "Tweet" button to facilitate the publication of Go-myLife content on Twitter.
- Go-myLife users could view the *tweets* of their contacts independently of whether they have or don't have a Twitter account. If they have, they could interact directly but if a non-Twitter user would like to comment on this content, this would have to be through Go-myLife.

For further information on how this integration could take place, please visit <http://dev.twitter.com/>

## 6 Social network engines

This chapter will evaluate all the possible engines that contain the functionalities needed for the proper development of the Go-myLife platform.

A number of engines were analysed, specifically: LibreGeoSocial, Liferay, Dolphin, ELGG and Pinax. The analysis is given below, showing the strengths and weaknesses of each with regard to the needs of Go-myLife. In the end we decided to select LibreGeoSocial for developing the Go-myLife platform because it has a good quality geolocation component.

Which of the features one expects from a social network can be provided via each of these platforms will be explained, along with which features expected from Go-myLife can be included or can be developed for it.

### 6.1 LibreGeoSocial

LibreGeoSocial is a new FLOSS (Free Open Source Software) mobile social network framework. One of the main characteristic of LibreGeoSocial is that it has been developed to focus on the geolocation of nodes (in 3 dimensions, longitude, latitude and altitude). This framework allows users to create new multimedia content that can be added through a friendly API providing an abstraction of layers/channels that allow the integration of geolocated information within LibreGeoSocial. Users of LibreGeoSocial can refer to information and upload information associated to real objects around them from the mobile device. Users and contents are managed with social information, allowing the user to create their own social networks.

The LibreGeoSocial framework also offers a REST interface (Representational state transfer style of software architecture) to manage the social network and its contents easily. So, different clients for the social network can be easily developed making use of the services offered by the server. This separation between server and client side facilitates the development of multi-platform and multi-system clients. Also, clients could have the benefits of server improvements without any need for changes in the client.

There is an application example<sup>3</sup> of a LibreGeoSocial, with a client developed for Android. It is available in the Android Market. This client is focused on external channels and augmented reality to show the server contents.

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<sup>3</sup> [http://www.androidzoom.com/android\\_applications/social/libregeosocial-11\\_ftlw.html](http://www.androidzoom.com/android_applications/social/libregeosocial-11_ftlw.html)

## FEATURES OF LIBREGEOSOCIAL:

- Basic social network features:
  - Content management with GeoLocation information in 3D
  - Users management with privacy, friends, etc
  - Facebook account login
  - Status sync with Facebook and Twitter
  - Users are able to upload and tag geolocated multimedia contents.
  - All the contents are managed with layers abstractions. So, server contents are classified regarding different aspects: users' content, official contents, free/paid information, external data sources, etc.
  - Comments on contents
- Location features:
  - All the contents with Geolocation in 3D
  - Abstract methods to get the user's location:
    - Using the GPS sensor of the mobile
    - Detecting the position through the network (through the WIFI or IP address)
    - Manually
    - Using BIDI codes, bidimensional bar codes
- Friends management:
  - Search for friends
  - Privacy from friends
  - Distance, where are your friends?
- Social network multimedia contents:
  - Users, notes, photos, audio and videos
    - You can tag the real life objects with content. Several methods are provided to bring together the better position of the elements to tag in a 3D space, with respect to different environments
    - Privacy management
- External channels integration:
  - Support for external channels and information sources
  - API to develop external channels. These channels will be included in LibreGeoSocial automatically. The clients don't need to make changes to retrieve the information regarding new channels.
  - Currently supported: 11870 (Spanish Yellow Pages), Youtube and Panoramio
- Augmented reality
  - Augmented reality module to visualize contents
  - Augmented reality to tag (create content) real objects
- Image recognition
  - Automatic tracking of objects. You could overlay information over the tracked objects
  - Find similar contents with image recognition
- Searches:
  - Syntactic and semantic searches.

- Semantic searches are allowed thanks to a natural language processing module
- Dynamic groups:
  - Dynamic generation of groups using different algorithms to create groups regarding: position, users, notes, etc
- Routes:
  - Possibility to create routes with users movements.

The android application is a good example of the features included in LibreGeoSocial framework to create a social network. Other social networks could be created with this framework/engine focused on different aspects and platforms, for example, focused on elderly people.

Below there are links to a few videos of the Android application, as an example of how LibreGeoSocial services can be used:

1. <http://www.youtube.com/watch?v=GTgocMYUiK8>
2. <http://www.youtube.com/watch?v=Mo5M5Xb2FqU>
3. <http://www.youtube.com/watch?v=dIWViWgKUcY>

## 6.2 Liferay

Liferay Portal (<http://www.liferay.com>) is the world's leading open source enterprise portal server using the latest in Java and Web 2.0 technologies.

1. Runs on all major application servers and servlet (small program that runs on a server) containers, databases, and operating systems, with over 700 deployment combinations
2. Out-of-the-box usability with over 60 portlets (pluggable user interface software components that are managed and displayed in a web portal) pre-bundled.
3. Compliant with JSR-286, the Java Portlet specification v2.0
4. Out-of-the-box usability with over 60 portlets pre-bundled.
5. Built in Content Management System (CMS) and Collaboration Suite
6. Personalized pages for all users
7. Benchmarked as among the most secure portal platforms using LogicLibrary's Logiscan suite

It is used worldwide with a new release every 8 months and it has an active developer community.

Technical specifications: <http://www.liferay.com/products/liferay-portal/tech-specs>

Documentation: <http://www.liferay.com/documentation/liferay-portal>

## Portal Architecture:

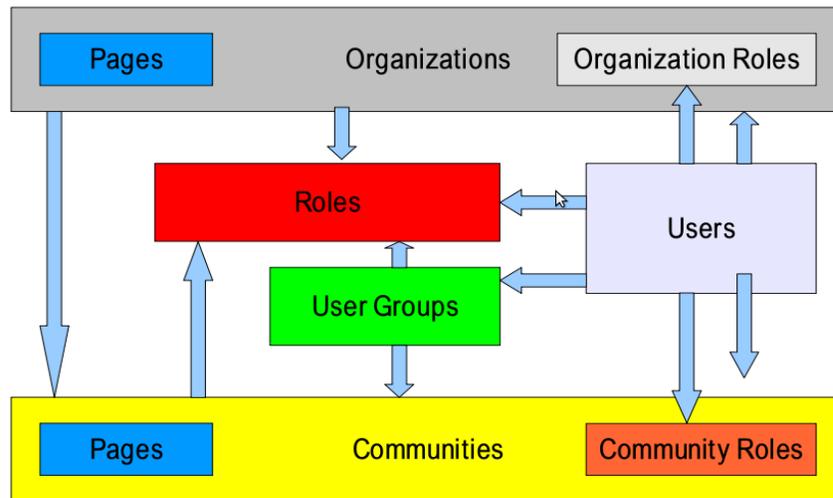


Figure 28. Liferay Architecture

Portals are accessed by users. Each user has their own public page (accessible by anyone) and private page (only accessible by themselves). Users can be collected into User Groups and belong to Organizations or Communities (with their own pages). Organizations can be grouped into hierarchies. Users, Groups, and Organizations can belong to Communities that have a common interest. Roles can be scoped by Portal, Organization, or Community.

### Which services can Liferay offer?

Liferay comes with a set of official portlets. Portlets are web applications that run in a portion of a web page. The heart of any portal implementation is its portlets, because they are where all of the functionality is implemented. Liferay's core is a portlet container, and the container's job is to aggregate the set of portlets to appear on any particular page and display them properly to the user. Liferay offers the possibility of customizing an existing portlet or building your own one. The community has also developed several portlets.

### **Portal Administration**

The Liferay Control Panel is a single interface that sophisticatedly consolidates all Liferay administration portlets, granting control over all content, users, organizations, communities, roles, server resources, and more. It is fully customizable with the ability to hide different parts of the form as desired or add custom ones with portlets.

### **Social Networking**

Liferay opens up new possibilities for communication and social interaction with the tools and framework for building a fully functional social network that can be customized to meet specific needs.

- Wall: This is a Facebook-style news feed on which users and designated friends post publicly viewable messages for one another.

- Friends List: This is a dynamically generated list of “friends” or members of the same community. Friend “invitations” may be sent.
- Private Messaging: Allows users to send short messages to other “friends”, displayed as private or publicly viewed messages on their walls (This is offered as an optional plugin).
- Requests: This displays invitations to join communities or add other users as “friends”.
- Recent Activities: This displays the most recent activity performed by a group of users and can be customized to display results for specific activities.
- Friend Map: This displays the current location of you and your friends on a Google Map.
- Chat: An AJAX Enterprise Instant Messaging client that allows users to automatically chat over Jabber protocol with other logged-in portal users. Chat sessions persist across portal pages and are as secure as other portal functionality.
- My Summary: This portlet displays a summary of user's profile.

### **Community**

A community in Liferay is like a separate portal instance. Each gets its own set of pages, content management system, shared calendar, and default permissions. Users can easily manage the communities and groups to which they belong.

- My Communities: Displays a list of all communities that a user belongs to. A user belonging to multiple communities can navigate among them within the same portal session.
- Directory: A listing of all users registered on the portal with personal information for individual users. It also provides listings of available organizations, locations, and user groups.
- Bookmarks: A simple way for users to keep track of URLs in the portal. The Bookmarks Portlet can also be used by an administrator to publish relevant links to a group of users.
- Invitations: Allows users to invite others to join a specified community.
- Page Comments & Ratings: Allows users to leave comments and ratings on any user page.
- SMS Text Messenger: Users can send SMS messages from the portal.

### **Collaboration**

Liferay’s collaboration tools enable productive discussion around all ones collective knowledge. Not only can users manage their own work experiences with built in email and personal calendars, they can dynamically share their work and thoughts as part of a team.

- **Blogs:** A portlet that includes full WYSIWYG (what you see is what you get) editing capability and publication date, RSS support, threaded user and guest comments, tags and labels, social bookmarking links, email notifications of blog replies, and an entry rating system.
  - **Blogs Aggregator** – A portlet that grabs blog entries from the entire portal or by specific organizations.
  - **Recent Bloggers** – Dynamically displays a list of recent bloggers.
- **Message Boards:** A full-featured forums solution with threaded views, categories, RSS capability, avatars, file attachments, previews, dynamic list of recent posts, and forum statistics. Message Boards work with Liferay's fine-grained permissions to give detailed levels of control to administrators and users.
- **Wiki:** A straightforward Wiki solution with versioning capabilities; categories; Classic Wiki, HTML, or plain text modes; WYSIWYG editing; page history and reversion; and permissions.
- **Mail:** A full AJAX-based webmail client that can be configured to interface with many popular IMAP email servers. This portlet allows users to send and check email directly through the portal.
- **Shared Calendar:** A community-based calendar with task lists that allows users to create, manage, and search for events. Events can be shared across communities, and event reminders can be set up to alert users of upcoming events by email, Instant Message (IM), or SMS.
- **News & RSS Portlets:** These allow users to get dynamically updated digests of critical news topics, blogs, and other publications. Users can configure the order of topics displayed and how many articles are shown per provider.
- **Announcements:** This offers a free form text area that can display and update new information quickly. The Announcements Portlet is visible to all page visitors.

### **Web Content Management System (WCM)**

Liferay's integrated web publishing system allows users to create, edit, and publish articles (note: WCM was formally called Journal):

- **Liferay WCM:** the main interface for Liferay's integrated web publishing system. It allows users to create, edit, and publish articles.
- **Panel WCM Articles:** It displays a dynamic list of all articles for a given Community. The list can include the top articles by creation date, publication date, title, or other criteria and will automatically update when new articles are added to the content management system.
- **WCM Content:** This portlet can be used to publish any article created within Liferay WCM on a portal page.
- **Document Library:** Provides document management with Microsoft Office® integration, backed by the Jackrabbit JSR-170 compliant Java content repository.

Includes check in / check out, meta data, and versioning. Document file formats may be converted at the time of upload.

- **Image Gallery:** It stores all image files with AJAX enabled previews.
- **Asset Publisher:** It allows users to publish any piece of content in your portal as though it were a Journal Article, either through a set of publishing rules or by manual selection.
- **Knowledge Base:** It allows users to add and categorize content in the form of articles. Content can be added directly through the web or imported from external sources with category-based navigation to help users easily find answers to questions they may have. (This is offered as an optional plugin.).
- **Webform:** It allows users to create custom forms.
- **Polls:** The Polls Portlet allows users and administrators to create multiple choice polls that keep track of votes and display results on the page. Many separate polls can be managed; a separate portlet can be configured to display a specific poll's results.
- **Breadcrumb:** It displays a trail of “parent” pages for the current page. The Breadcrumb Portlet can be placed on public portal pages as a navigational aid when using Liferay to publish websites.
- **Navigation:** It provides a directory of links reflecting the portal's page structure, with drill down into the current page. Style and appearance can be adjusted. Unlike the Breadcrumb Portlet, the Navigation Portlet displays links for other pages outside of the current page's trail of “parent” pages.
- **Categories Navigation:** It displays and sorts site content based on hierarchical tag categories.
- **Tabs Navigation:** It displays and sorts site content based on specific tags.
- **Site Map:** It displays a structured directory of links to all pages in the portal. The Site Map can be used to navigate directly to any page on the site. It can be configured to display the entire site or a sub-section of pages.

### ***Other Tools***

Multi-Language, OpenID Sign In, Search, Maps, Webcam portlet, OpenSocial, etc.

### ***Social networks integration***

There are already developed portlets in Liferay that shows part of the user's information on existing social networks such as Twitter or other content providers such as Flickr or Youtube...

- **Twitter portlet:** The Twitter portlet demonstrates how to display Twitter feeds. In this case, your Twitter feeds will show up in the Members' Activities portlet and the Friends' Activities portlet. Simply add a Twitter account in the account settings under the social networking section.

- Flickr portlet: Showing the user's photos and the photos of his or her contact. It also adds a search box.
- Youtube Portlet: It displays the favourite videos of the configured user.
- Google Maps portlet: It shows a map of Google Maps centred in the location specified by the administrator of the portal. A search input box can be shown to undertake searches for locations or to get directions.
- MySpace gadget: It is a Google gadget. It shows the message's inbox and friend request of the user.

The portlets can be downloaded in: <http://sourceforge.net/projects/lportal/files/>

It also features an [OpenSocial](#) container based on [Shindig](#) to add OpenSocial gadgets to Liferay portal.

With Liferay, any developer can build his or her own portlet or customize an existing one. Knowing the connector APIs for the specific social network, it would be easy to implement the desired functionality.

### 6.3 Dolphin

Dolphin (<http://www.dolphinsocialnetworking.com/>) is an open-source social networking package that can be extended with a great number of available plugins. The engine enables the creation and design of social networks with a complete set of tools to get the site up and running. Dolphin comes with its own forum, mobile device application, videos, music, ads, RSS, etc.

#### *Factsheet*

**Current Version:** Open Source, v7.0.1

**Connection to other social networks:** Yes (via plugins, extensions. The policy of this framework works like a market of plugins, extension, templates, etc.

**Connection to other tools:** Yes. OpenID, Facebook Connect and Janrain

**Plug-ins, add-ons, templates:** Yes. Over 1,300, but the policy to get the components is by means of a market, but most of the plugins are not free.

**Usability:** The framework is entirely programmed in PHP, so the usability items could be programmed in a friendly way.

**Accessibility:** Accessibility or functional diversity are not issues that are included in the site documentation. We would need to program it from scratch.

**Mobility:** There is an iPhone app with different functionalities. An Android app has been announced, but it is not available yet.

#### Features<sup>4</sup>

<sup>4</sup> <http://www.boonex.com/trac/dolphin/wiki/Dolphin7Docs>

Dolphin 7 is an open-source, downloadable, scalable, customizable, full-featured, independent and free software package for building social networks. Dolphin is an "all-in-one" bundle of PHP community scripts.

- **Software tools**

There is one social networking package, with scripts, customization and **all the source code available**. There is a great variety of features and options that could be deployed in unique social network.

- **Open source code.**

It offers unencrypted PHP source code, flash apps source code, desktop apps and mobile apps source code. It also allows the integration with custom features. Dolphin is **hosted on its own server** that it lets have complete control over your community site members **and content**. It allows promotion of one's **own brand or project and control of the advertisements**.

- **Scalable Software.**

Dolphin is **scalable**, and has been tested on **tens of thousands of working online communities**.

Dolphin is regularly updated and future versions are planned. There is an active developer community.

- **Drag-and-drop "Builders"**

Dolphin works with the idea of "visual modification" with drag-and-drop "Builders" that allow the developer to arrange content, customize profiles and create whole new custom pages and page elements. "Builders" control forms, blocks, modules pages and navigation menus of the community site.

- **Customizable database fields and forms**

In the deeper levels of "visual modification", Dolphin, allows the developer to customize specific fields in join and search forms; control default profile fields and their visibility and thus build all sorts of communities.

- **Membership and access levels**

Different community sites, closed or open social networks all require different approach to membership statuses and rights.

- Creation of **multiple membership levels** with configurable access parameters.
- Different access levels to **all parts of the community site**, including specific pages and even page blocks.
- Charge membership fees and integration with **different payment providers**.

- **Market plugins**

There are more of 1,300 extensions, templates, plugins, language packs and modifications, under the policy of an application marketplace, with some free and mostly paid components.

- **Communication elements**

There are a great number of modules and apps, including: Video chat, video messenger, players, mobile app, desktop app, groups, events, blogs, files, media sharing, store, etc.

- **Fast and secure community software**

The company behind Dolphin takes software speed and security seriously. Every version update goes through vigorous 3rd-party security audit and **they constantly optimise Dolphin community script code**, database structure and [recommended server setup](#) to ensure fast loading speed and great performance at high loads.

- **Access to social networks:**

The access to social networks is by means of Janrain or OpenId. The first provides access to different social networks such as Facebook, Myspace, Linkedin, Twitter, Flickr among others. Janrain enables the owners of mail account in Google, Microsoft (Hotmail), Yahoo or AOL to create a Janrain account with the following functionalities:

Janrain demonstrates that implementing website user authentication for multiple websites does not need to be difficult in spite of the many associated challenges such as:

- User preferences for login vary across verticals and geographies;
- The protocols and methods used for signing in a user to your website differs from provider to provider as does the data returned at login; and
- Various providers share different types of information about the user and label the data fields differently (for example, two providers may pass back a user's first name as first\_name and givenName respectively).

Janrain hides the complexities of implementing website user authentication by standardizing the user login process across all supported providers. Janrain **normalizes the profile fields** returned into the Portable Contacts format **providing a consistent way to access data**.

On the other hand, OpenID allows the user of an existing account to sign in to multiple websites, without needing to create new passwords. The user may choose to associate information with the OpenID that can be shared with the websites you visit, such as a name or email address. Several large organizations either issue or accept OpenIDs, including Google, Facebook, Yahoo!, Microsoft, AOL, MySpace, Sears, Universal Music Group, France Telecom, Novell, Sun, Telecom Italia, and more than 50,000 web sites.

- **Other options**

Other interesting features of the Dolphin framework is the availability of a wiki (via plugins), RSS, bookmark sharing, tagging and support for the semantic web.

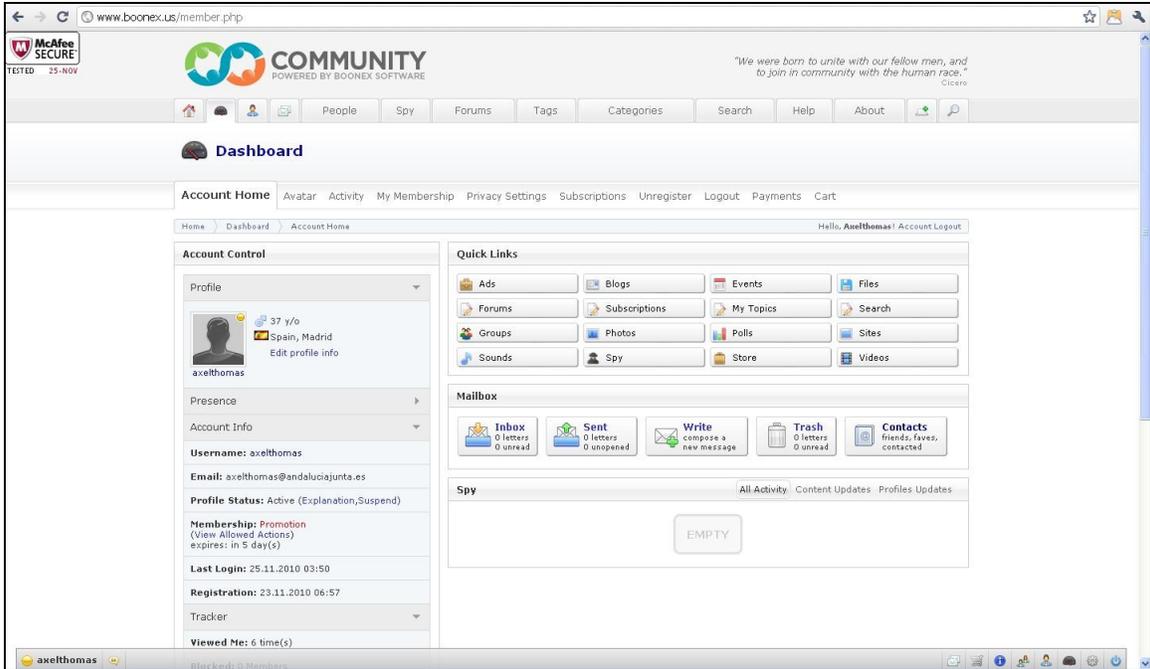


Figure 29. The social network Boonex developed with Dolphin

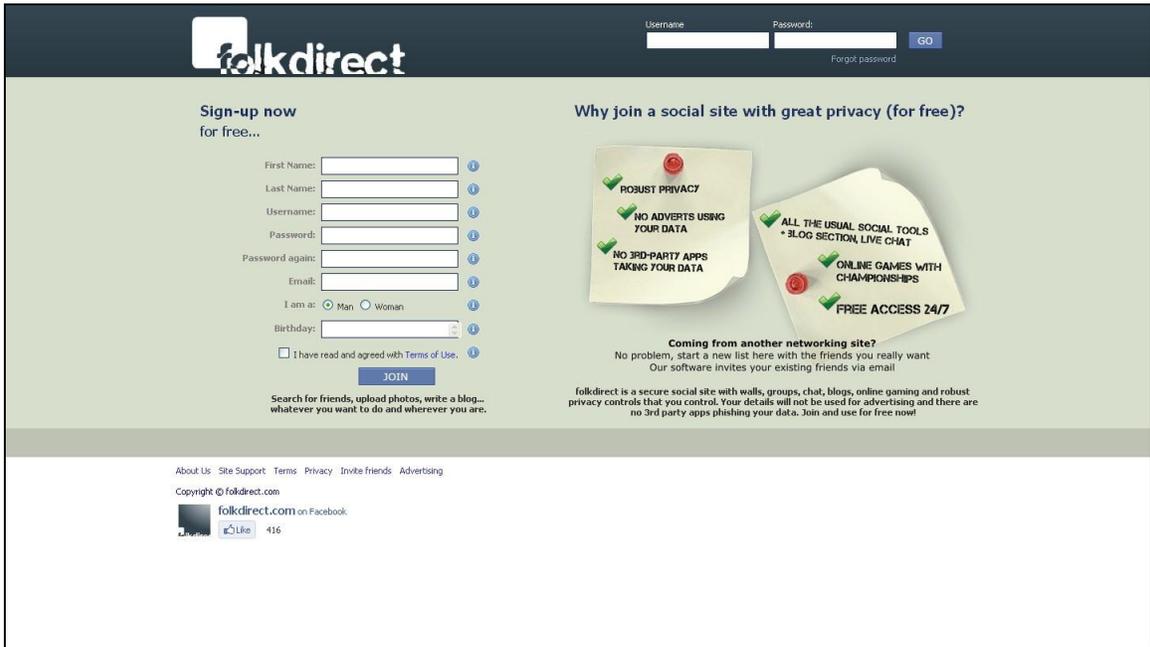


Figure 30. The social network Folkdirect developed with Dolphin

**Comments:**

The Dolphin framework has a large number of features and components available. The engine was deployed and is working fine under different social networks (most of them in dating networks), and allows the scalability and security of the site to be maintained in

good condition. The drawbacks are that most components of the platform are not free, (although most of them do not have very high prices, ranging from \$30 to \$200) and the lack of complete and detailed documentation. The mobile solution developed for the engine is an iPhone application, although the features of the app don't take into account the possibilities of geolocation and location awareness.

## 6.4 ELGG

Elgg is an award-winning social networking engine, focused on delivering the building blocks to enable businesses, schools, universities and associations to create their own fully-featured social networks and applications. (<http://www.elgg.org/>).

Elgg has been designed from the ground up to be social. It comes with a comprehensive range of tools that enable the user to connect, share and collaborate both within their organizations and externally. With features including Profiles, Activity Streams, Conversations, Blogging, Social Bookmarking and much more, Elgg makes a powerful social hub for any organisation, and can therefore also provide a good social hub for Go-myLife.

### **Factsheet**

**Current Version:** Open Source, v1.7.5

**Connection to other social networks:** Yes (i.e. Facebook, and Twitter)

**Connection to other tools:** Yes. OpenID, OAuth, Cas Auth, LDAP, Docuwiki, Moodle

**Plug-ins, add-ons:** Yes. Over 1.000

**Usability:** It supports CSS, themes, languages, media content, content editing, personalized layouts, and etcetera which give the chance to adapt the interface to specific needs. It looks quite flexible

**Accessibility:** The documentation provides no clue about accessibility or functional diversity. There would therefore be the need to program from scratch.

**Mobility:** There are no developments on mobile devices.

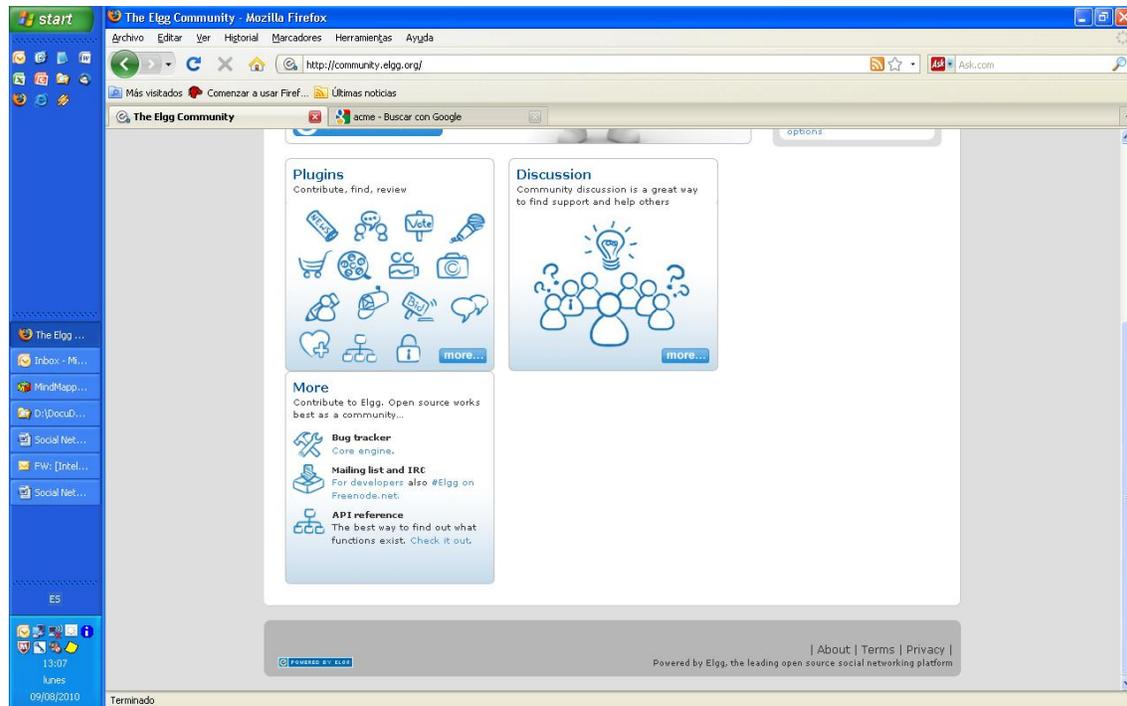


Figure 31. Elgg's frontpage

## Features

- Rich, informative profiles for users.**  
 Elgg's Profile feature can be extended or tailored to suit the audience, enabling users or communities to establish new contacts or identify key people who have specific knowledge or strategic business relationships, both internally and externally.
- Real-time updates on site, groups and channel activity:**  
 Activity Streams enable the user to easily keep on top of what's going on across their site, with real time updates from their connections, groups or channels.
- Real-time microblogging style conversations:**  
 Elgg enables the user to hold microblogging-style conversations with colleagues and friends, or simply publish concise, targeted messages to their audience. A Twitter user can keep their followers up to date by automatically updating Twitter whenever they post, or pull in their tweets to share with users inside their own social hub.
- Work together in structured groups.**  
 The Groups feature provides a great way for people who share a common interest to collaborate by exchanging and sharing information and documents with one another. It enables users to easily set up public or private groups and start working together around specific topics or interests.
- Communities:**

ELGG allows the creation of dedicated private or public communities for specific niche areas, so that users can share information and communicate in a controlled environment.

- **Blogging, documents, media and bookmarks.**

ELGG allows the uploading of files, documents and pictures, as well as allowing them to be tagged and others to add their comments. The engine allows the user to maintain a blog, share web resources via social bookmarking and promote discussion, while retaining control over access to their content. Another feature provided for the framework is the ability to create photo albums, subscribe to news services via RSS and search for videos, on services such as YouTube, then add them to the user's personal or group gallery.

- **Access to social networks:**

Access to other social networks is provided via a plugin for Facebook, YouTube, Twitter and VEOh. For other social networks, ELGG supports OpenSocial and OpenID. OpenSocial is a common API for social applications across multiple websites. With standard JavaScript and HTML the developers can create apps that access different social networks, such as hi5, LinkedIn, MySpace, Netlog, Ning, Orkut, and Yahoo.

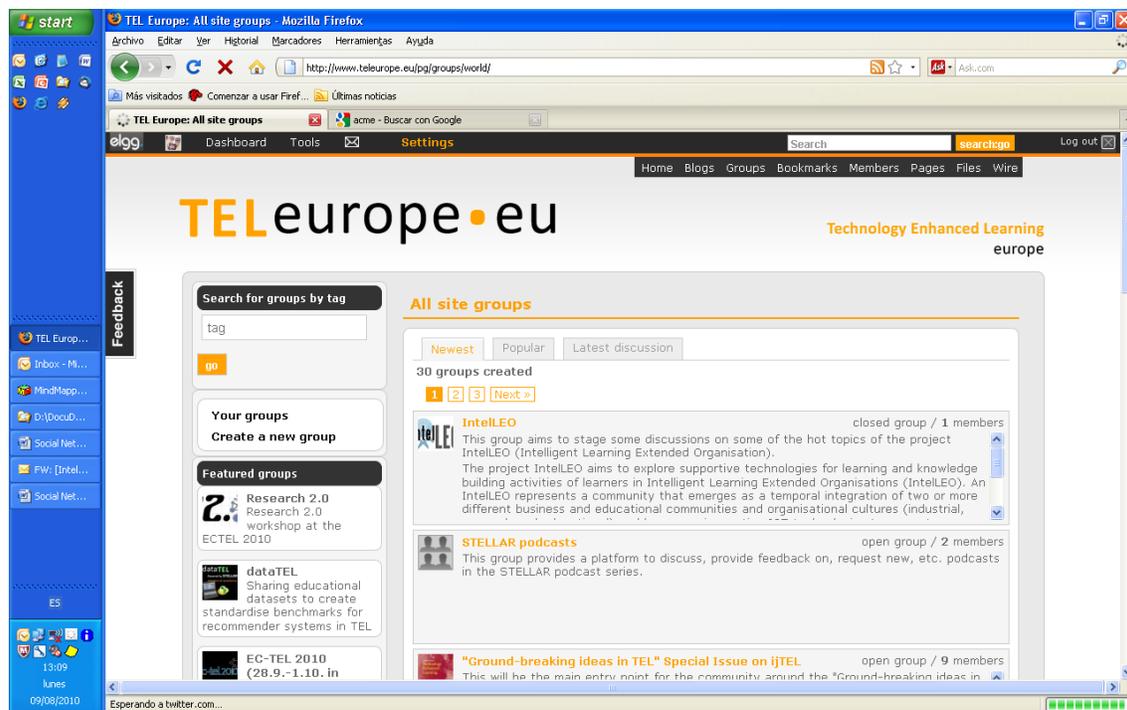


Figure 32. TELEurope: Example of implementation

- **Administration:** The network comes with an intuitive Administration Panel, which gives the administrator control over the features available to users as well as the overall look and feel of the site. The administrator also retains full control over who gets to access the site as well as view the content.

- **Export of data:** With Elgg, Go-myLife would retain full ownership of its data and content. It would be able to export its data at any time, if it would want to make a back-up or if it would decide to migrate the platform to its own servers.

- **Other options**

Other interesting features of the ELGG framework are the availability of a wiki (via plugins), RSS, bookmark sharing and tagging.

### Comments:

Great numbers of sites have been developed with the ELGG engine, which it ensures the security and robustness of the environment. ELGG seems easy to develop and to maintain and the wiki's documentation is clear and well elaborated, with a lot of code examples. A great feature of the engine is that owners can export all their data at any time at the click of a button to other social networks.

An important drawback of this solution is the lack of developments regarding mobility.

## 6.5 Pinax

Pinax<sup>5</sup> is composed of a set of Django applications that can be used separately. Pinax allows the creation of web sites with social aspects quite easily. Thanks to the Django<sup>6</sup> framework, new features can be developed very easily. It is licensed under MIT license (a MIT license is a permissive free software license originating at the Massachusetts Institute of Technology (MIT) that permits reuse within proprietary software provided all copies of the licensed software include a copy of the MIT License terms. Such proprietary software retains its proprietary nature even though it incorporates software under the MIT License)

Pinax is used by several web sites, in order to create their own social networks.

Here are a few examples:

1. <http://www.foodsel.com/welcome/>
2. <http://tuttivisti.com/>
3. <http://trailmapping.com/>
4. <http://cloud27.com/>

Taking this last web site as an example, it can be seen that the final result is very good. In fact, Cloud27 is a great example of a social network created by Pinax developers without the need for very many modifications. This is an important point, because it means that the developer doesn't need to spent a great deal of effort in the framework/tools or/and in the basic features of a social network.

Some features of Pinax:

- OpenID support

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<sup>5</sup> Pinax: <http://pinaxproject.com/>

<sup>6</sup> Django: <http://www.djangoproject.com/>

- Notification system
- Contacts import
- Internal messages between users
- Friends Invitations
- User's groups
- Projects with tasks
- Forums
- Wikis
- Blogs
- Picture galleries

Pinax is a good product, specially, for a developer with Django development experience and it also offers a great number of applications.

In relation to the scope of Go-myLife, Pinax lacks Geolocation features. There are no specific applications to manage Geolocation features and the database model has no focus on this aspect. The MVC (Model-View-Controller) is involves too much coupling, so, the data model and applications are very dependent on the web pages. The web pages use Django templates and tags to refer the data models. This makes Django a social network engine very focused on creating social networks on the web, and makes it too complicated to offer web services that could allow developing alternatives to a social network on the web.

## 7 Accessibility

### 7.1 Accessibility General Standards

In human-computer interaction, computer accessibility refers to the accessibility of a computer system to all people, regardless of disability or severity of impairment. It is an important concern for both software and web designers. They have to consider standards in order to produce applications that enable the use of a computer by every person, independently of any possible disability, and any special device (Assistive Technology) that they have to use.

#### 7.1.1 Software accessible in ISO

The ISO 9241 series (“Ergonomics of Human System Interaction”) provides guidance on the design of software that is accessible and connects and interacts with supporting tools of assistive technology. Designers of software are specially affected by ISO 9241-20:2008 “Accessibility guidelines for information/communication technology (ICT) equipment and services” and ISO 9241-171:2008 “Guidance on software accessibility”. It also references the W3C's Web Content Accessibility Guidelines.

**ISO 9241-20:2008<sup>7</sup>:** This part of ISO 9241 is one of the introductory parts which apply to both hardware and software and aims to improve accessibility for use at work, at home, in mobile and public environments.

It covers the design and selection of equipment and services for all the people even those with a wide range of sensory, physical and cognitive abilities, including those of us who could be temporarily disabled, and the elderly. It contains general recommendations on:

- Managing development of accessible ICT equipment and services
- User characteristics (Vision, Hearing, Speech, Physical capabilities, Cognitive capabilities)
- Task characteristics
- Equipment and service characteristics
- Environmental characteristics.

**ISO 9241-171:2008<sup>8</sup>:** This standard is aimed at software designers and provides guidance on the design of software to achieve a high level of accessibility. It replaces the earlier Technical Specification ISO TS 16071:2003 – Guidance on accessibility for human-computer interfaces and follows the same definition of accessibility - ‘usability of a product, service, environment or facility by people with the widest range of capabilities’. It applies to all software, not just web interfaces. The key contents are:

- Rationale and benefits of implementing accessibility
- Principles for designing accessible software
- General guidelines and requirements including compatibility with assistive

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<sup>7</sup> [http://www.iso.org/iso/catalogue\\_detail?csnumber=40727](http://www.iso.org/iso/catalogue_detail?csnumber=40727)

<sup>8</sup> [http://www.iso.org/iso/catalogue\\_detail.htm?csnumber=39080](http://www.iso.org/iso/catalogue_detail.htm?csnumber=39080)

- technology
- Inputs including keyboards and pointing devices
- Outputs including visual, audio and tactile outputs
- On-line documentation, “Help” and support services.

### 7.1.2 Web accessibility in ISO and WAI-W3C accessibility guidelines

ISO 9241 is also relevant to designers of web interfaces, in particular ISO 9241-171:2008 “Guidance on software accessibility”, described before. It also references the W3C's Web Content Accessibility Guidelines.

The Go-myLife system should conform to **WAI-W3C accessibility guidelines**<sup>9</sup> (WCAG 2.0) as they are the internationally recognised standard on accessibility. This is a summary of general recommendations of WCAG 2.0:

- **Perceivable**
  - Provide text alternatives for non-text content.
  - Provide captions and alternatives for audio and video content.
  - Make content adaptable; and make it available to assistive technologies.
  - Use sufficient contrast to make things easy to see and hear.
- **Operable**
  - Make all functionality keyboard accessible.
  - Give users enough time to read and use content.
  - Do not use content that causes seizures.
  - Help users navigate and find content.
- **Understandable**
  - Make text readable and understandable.
  - Make content appear and operate in predictable ways.
  - Help users avoid and correct mistakes.
- **Robust**
  - Maximize compatibility with current and future technologies.

The next 10 basic accessibility recommendations were prepared for WCAG 1.0, but are still good recommendations to start with web accessibility:

1. **Images & animations:** Use the alt attribute to describe the function of each visual.
2. **Image maps.** Use the client-side map and text for hotspots.
3. **Multimedia.** Provide captioning and transcripts of audio, and descriptions of video.
4. **Hypertext links.** Use text that makes sense when read out of context. For example, avoid "click here."
5. **Page organization.** Use headings, lists, and consistent structure. Use CSS for layout and style where possible.

<sup>9</sup> <http://www.w3.org/TR/WCAG20/>

6. **Graphs & charts.** Summarize or use the longdesc attribute.
7. **Scripts, applets, & plug-ins.** Provide alternative content in case active features are inaccessible or unsupported.
8. **Frames.** Use the noframes element and meaningful titles.
9. **Tables.** Make line-by-line reading sensible. Summarize.
10. **Check your work.**

## 7.2 Usability General Standards

Usability is an example of a non-functional requirement. As with other non-functional requirements, usability cannot be directly measured, but must be quantified by means of indirect measures or attributes.

### 7.2.1 User centred Design (UCD)

There is an international standard that should be the basis for every User centred Design (UCD) methodology. This standard is provided by the International Organization for Standardization (ISO) and it is “ISO 9241-210:2009<sup>10</sup>. (Ergonomics of human system interaction - Part 210: Human-centred design for interactive systems)” (formerly known as 13407). It defines a general process for including human-centred activities throughout a development life-cycle, but does not specify exact methods. The phases of the cycle are represented in next figure, and the process ends once the requirements are met.

The Go-myLife design of the interface should follow this methodology to assure usability aspects in their designs.

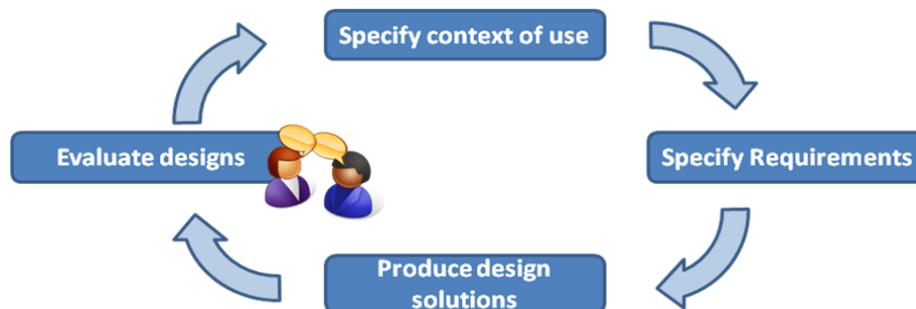


Figure 33. Phases of UCD life-cycle

### 7.2.2 User-centred design methodology

#### Analysis Phase

- Meet with key stakeholders to set vision
- Include usability tasks in the project plan
- Develop usability goals and objectives
- Conduct field studies
- Look at competitive products

<sup>10</sup> [http://www.iso.org/iso/catalogue\\_detail.htm?csnumber=52075](http://www.iso.org/iso/catalogue_detail.htm?csnumber=52075)

- Create user profiles
- Develop a task analysis
- Document user scenarios
- Document user performance requirements

#### Design Phase

- Begin to brainstorm design concepts and metaphors
- Develop screen flow and navigation model
- Do walkthroughs of design concepts
- Begin design with paper and pencil
- Create low-fidelity prototypes
- Conduct usability testing on low-fidelity prototypes
- Create high-fidelity detailed design
- Do usability testing again
- Document standards and guidelines
- Create a design specification

#### Implementation Phase

- Do ongoing heuristic evaluations
- Work closely with delivery team as design is implemented
- Conduct usability testing as soon as possible

#### Deployment Phase

- Use surveys to get user feedback
- Conduct field studies to get info about actual use
- Check objectives using usability testing

### **7.3 Standards Resume**

From an accessibility perspective we should work towards ISO standard and WAI recommendations. They cover the design and selection of equipment and services for people with a wide range of sensory, physical and cognitive abilities, including those temporarily disabled. Go-myLife should aim at ISO 9241-20 and ISO 9241-171

As Go-myLife requires a web interface design, in addition to the ISO standards, it must be WCAG2.0-compliant.

From a usability perspective Go-myLife must be compliant with usability standard ISO 9241.

<b>Accessibility</b>	ISO standard and WAI recommendations	The system must be compliant with accessibility standards. They cover the design and selection of equipment and services for all the people even those with a wide range of sensory, physical and cognitive abilities, including those of us who could be temporarily disabled, and the elderly people.	Go-myLife must follow ISO 9241-20 and ISO 9241-171  As Go-myLife requires a web interface design, in addition to the ISO standards, it must be WCAG2.0-compliant
<b>Usability</b>	ISO standard	The system must be compliant with usability standard ISO 9241	Go-myLife must follow ISO 9241

#### ***7.4 Accessibility and usability aspects related to elderly people***

The end users of Go-myLife will be older people, who may suffer losses in some or all of the following areas: sensory, mobility, manual skills, motor and cognitive. These changes, that may be present in a person with different degrees of severity, require the development and design of systems and interfaces that eliminate the barriers associated with these physical constraints.

When people get older, they usually retain their intellectual abilities but find it difficult to focus on a particular task. Moreover, they usually need more time to undertake tasks and have less memory available for the storage of new information. Changes in cognitive functions affect the speed with which information is processed, so these problems may arise in the interaction with applications if the speed of response demanded is too quick for this aging group.

These guidelines we have specified in this document are intended to achieve a suitable level of accessibility through simplicity of design, multimodal contents, the avoidance of stress and physical fatigue and easy-to-understand contents. One of the strategies to achieve a high degree of accessibility would be the use of multimodal interfaces that present information through various channels, making it redundant and ensuring the users understand one or another format depending on their capacity. For example, for users with severe visual impairment or blindness, text versions of web sites are essential for the use of speech synthesizers. Despite problems with vision representing the most significant disabilities because they affect the largest number of users we cannot forget that using a keyboard or mouse can become a serious limitation. Certain physical disabilities may even render the use of a keyboard or mouse impossible.

## 7.4.1 General Guidelines

Most international standards on accessibility and usability focus on the following when designing digital tools that will be used by adults:

1. Provide a wide variety of interaction options (multimodal) to ensure that differences in physical abilities, such as visual and auditory deficits, do not limit the accessibility of products and services.
2. Create dimensions, designs and controls to minimize stress and physical fatigue taking into account the physical differences of the various users, such as body type, strength, motor and postural control.
3. Display information in a way that is easy to understand for users of different backgrounds, experiences, cultures and languages.
4. Make interface design exceptionally easy to use: this also improves the confidence, efficiency and satisfaction for all people.

Taking into account the changes in vision, hearing, manual skills and cognitive aspects that appear with aging, it is essential to promote interfaces with:

- Use of redundant contents
- Error tolerance
- Perceptible information:
  - Font sizes, sounds, icons (with a bigger size than usual), colour contrast (enough contrast between the foreground colour and the background colour selected).
- Avoid technical language.
- Avoid significant physical effort (eliminate scroll bars if possible)
- Minimalist design
- Attractive and pleasant design, to make the technology attractive
- Limited Functionality: reduce the number of steps to perform any action to avoid users feeling they are lost.
- Personalization: for those with accessibility needs related to visual, hearing and motor disabilities (W3C guidelines)

### 7.4.1.1 Easy-to-Read

Older people may suffer changes in cognitive functions that affect the speed with which information is processed. An important recommendation presented in the guidelines previously is to show the material in an easy-to-understand way, for example by the so-called procedure of Easy-to-Read

Easy-to-Read is a form of writing to make the reading easier for everyone. It is based on simple text and clear messages. Easy-to-Read are contents that have been summarized and made using plain language, so that they can be understood by people with cognitive or intellectual disabilities. The main goal is that people with intellectual disorders or comprehension limitations can access all current information. Easy-to-Read also

improves access to information for seniors, immigrants, children with brain damage, people who are deaf and hard of hearing, people who are dyslexic for example.

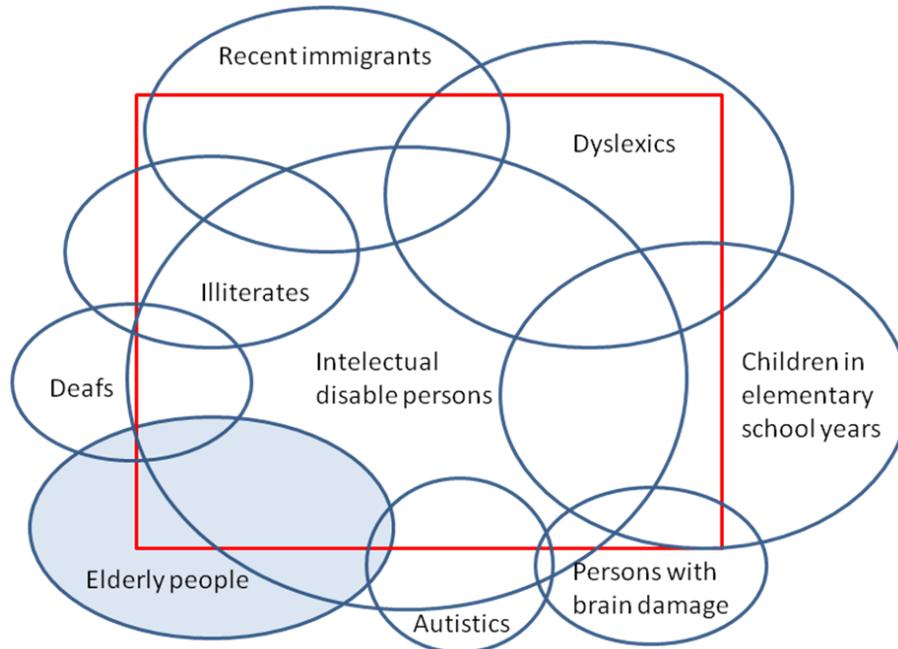


Figure 34. Users groups that may benefit with Easy-to-Read contents

The essential guidelines for writing Easy-to-Read contents are:

- Use short sentences and simple language
- Avoid negative phrases
- Avoid using too many numbers and mathematical descriptions. If a number has to be inserted it is better to write it in letters.
- Do not use metaphors or comparisons that can be confusing.
- Insert a single message for each sentence.
- Be clear, concise and direct.

The use of plain language should not be confused with the use of children's or too colloquial language. The essential feature when developing content Easy-to-Read is that the information should be clear and well structured. Is important to consider:

- Avoid saturated contents, complex applications, inadequate support elements, distractions and waiting times.
- Assure the clarity and a correct structure of the contents.

### ***7.5 Issues for the evaluation exercises with users in the pilots***

We need to consider the issues of usability and accessibility, not simply with relationship to the Go-myLife platform itself, but also in relation to the way the pilots are designed, in order to ensure that participants are able to provide effective feedback regarding product design.

This issue has been dealt with in-depth by deliverable D6.1 Methodology of pilot testing and evaluation. However, for the sake of completeness, some of the key issues which have to be kept in mind are sketched out here.

Some aspects to consider when evaluations are made with older people are:

- When older people are asked to evaluate systems (software or hardware) they usually blame themselves and their own incompetence for any malfunction of the system. They also tend to be very positive about the prototype presented to them instead of offering a more critical and objective view of the system. To achieve a more useful assessment:
  - It is important to assure them that they are not being judged.
  - It is also important to explain that their real opinion is very important in order to obtain accurate results for the research and development and make the highest quality product.
- When evaluation sessions are being planned, it is important to accommodate the schedules to the different rhythms of the participants. When trials that may involve several sessions are being planned, it is necessary to schedule them with enough advance notice. In this way, setbacks such as medical emergencies, family or social commitments can be taken into account.
- When the device used for evaluation of software is a mobile device it is highly recommended that people use their own mobile phone in the usability testing sessions, so the test can focus on the interface design and not on the way the handheld device works.

## 7.6 Devices in Go-myLife

The Go-myLife project is designed for the use of mobile devices to access the platform. However, on occasions a PC may be used instead. Therefore, the Go-myLife developers need to take into account both kinds of devices. In this chapter general aspects of the devices on which the digital application will be displayed are described.

### 7.6.1 PC usability

ISO 9241 presents detailed design principles for designing usable web sites. The standard covers five areas and provides relevant questions for designers to answer<sup>11</sup>:

1. **High-level design decisions and design strategy:** What is the purpose of the site and how is this made clear to its users? Who are the users and what are their goals?
2. **Content design:** What is the site's conceptual model? How is content organized and how should the site deal with issues such as privacy and personalization?
3. **Navigation and search:** How should the content be organized so that users can

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<sup>11</sup> [http://www.userfocus.co.uk/articles/ISO9241\\_update.html](http://www.userfocus.co.uk/articles/ISO9241_update.html)

- navigate the site easily? How will users search the content of the site?
4. **Content presentation:** How should individual pages be designed so that people can make use of the information? How should links be designed?
  5. **General design aspects:** how should you design for an international audience? How should you provide help? What download times are acceptable?

Some practical recommendations about website usability are:

- Your website must be consistent and easy to navigate
- Test your website under different operating systems, browsers (and browser versions) and scroll resolutions
- Add ALT and TITLE to your images if they need it.
- Use the correct spelling in your content
- Verify that your links work. Use appropriate texts to define your links
- Be careful with the contrast between fonts and background
- Give alternatives to your JavaScript effects
- Don't underestimate the importance of conventions: Users have gradually become accustomed to particular layouts and phrases on the Internet. Some examples:
  - The logo is in the top-left corner and links back to the homepage
  - The term 'About us' is used for organization information
  - Navigation is in the same place on each page and adjacent to the content
  - Anything flashing or placed above the top logo is often an advertisement
- Pages must download quickly
  - Do not use images to display text
  - Use CSS and not tables to lay out your web page
  - Use CSS and not images to create fancy navigation items
  - Put CSS and JavaScript in external files
  - Remove unnecessary meta content
- Make information easy to retrieve. In texts consider using
  - Headings
  - Link text
  - Bold text
  - Bulleted lists

### 7.6.2 Mobile & handheld usability

As the design of Go-myLife is oriented to be used in handheld devices via the web, it is smart to build a dedicated mobile site. While the recommendations given above in ISO 9241:2008 apply to a wide range of available front-end technologies, the design of mobile Web interfaces or smart devices could require additional guidance.

One issue is that people generally have less experience using their mobile devices for Internet browsing than they have of doing the same with a PC. Another challenge is that computer-based site visitors generally only differ from one another in their browser and operating system and it is therefore comparatively easy to provide a consistent user experience across these. However, mobile phones and tablet computers can differ from one another dramatically, and this variation will radically affect the user's experience and use of web applications.

Therefore, from the HCI point of view, mobile and handheld usability testing could be even more important than computer-based usability testing.

### Mobile phones and PDAs to consider

Because the mobile phone that someone is using will have an effect on his/her experience of your site, we should test mobile phones against the following criteria.

- Certain users prefer a particular types of phone e.g. phones with big screens that are designed to support online access vs. small-screen models that are not.
- There are 'phone families' that offer a very similar user experience (and will not need to be tested individually). To organize this families, consider devices with a number of different characteristics attending to:
  - Screen size (small vs. large)

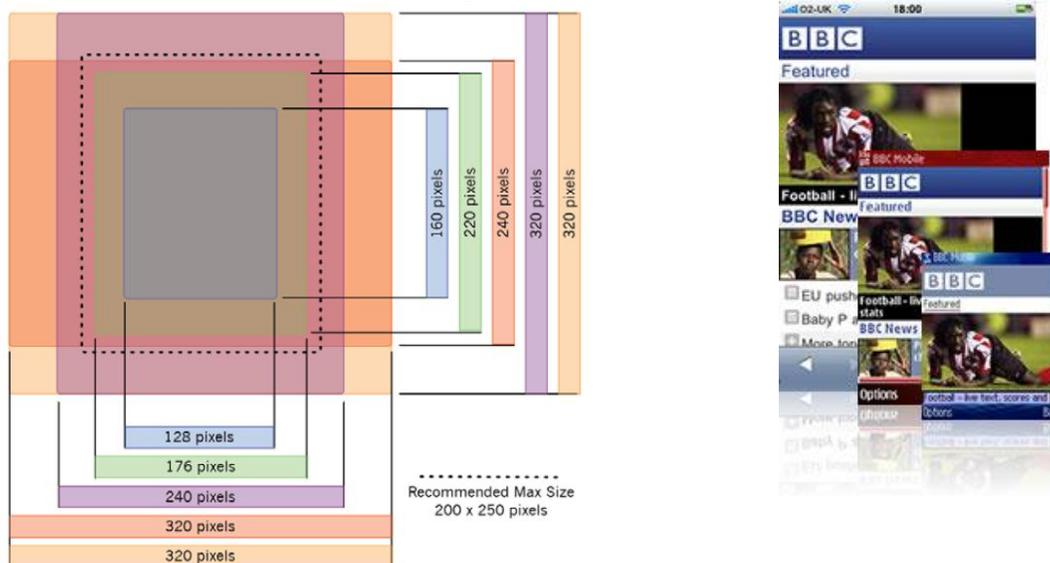


Figure 35. Screen sizes in mobile phones.

- Screen layout (portrait vs. landscape)
- Input device (stylus, numeric keypad, dial-wheel, QWERTY keypad)



Figure 36. Different input devices

o Operating System

**Top Smartphone Platforms in EU5 by Share of Smartphone Users\* 3 Month Average Ending July 2011 vs. July 2010**  
 Total EU5 (DE, FR, IT, ES and UK) Mobile Subscribers, Age 13+  
 Source: [comScore MobiLens](#)

Smartphone Platform	Share (%) of EU5 Smartphone Users		
	Jul-10	Jul-11	Point Change
Total Smartphone Users	100.00%	100.0%	0.0
Symbian	53.9%	37.8%	-16.1
Google	6.0%	22.3%	16.2
Apple	19.0%	20.3%	1.2
RIM	8.0%	9.4%	1.5
Microsoft	11.5%	6.7%	-4.8

Figure 37. Main mobile platforms.

- You may only want to test with the most popular mobile phones in Europe or the most popular models that are being used to access your site.

**Best practices for designing mobile applications**

- Simple navigation structures
- Useful and simplified content on every page - not just navigation
- Optimize for degradation



Figure 38. Optimization for degradation - normal view vs view without CSS

- Simplify forms (with clear buttons)
- Provide shortcuts
- Mobile usability testing methodology: the most popular methods include:
  - Lab-based (using a camera to record the session)
  - Diary-studies (asking people to keep a diary of how they have used their mobile phone and any problems they encounter)
  - Paper prototypes (running usability testing on a paper-based version of the site, using mobile phone screen-sized pieces of paper)

## 8 Conclusion - architectural specifications of Go-myLife platform

After considering the different possible architectural approaches, analyzed its pros and cons, Go-myLife will offer a client-server architecture that give us the flexibility that Go-myLife project needs. With this approach, it will be easy to develop multi-system and multi-platform clients independently of the technology of the server, rather than a standalone architecture where it is not possible to decouple both parts and development is subject to one specific technology or solution.

The success of Go-myLife will be based on the quantity of users it has. It is necessary to provide a client solution accessible from any place any time. In order to satisfy this requirement, a web application approach has been selected to guarantee the independence of device being used and to allow the access to Go-myLife wherever the user is.

For these reasons, we can summarize that Go-myLife architecture consists of 3 main parts:

- **Social Network Engine:** Once user requirements have been identified, the social network engine that best satisfies them will be selected. Inside this core, connectors to the other selected social networks will be implemented as well as the integration with external services.
- **Web Services:** The different functionalities of Go-myLife will be offered through web services. The client applications will make use of them to offer the desired functionality.
- **Web client application:** On the client side, two different web applications will be designed: one for desktop and another one for mobile phones with styles and interfaces adapted to the specific device to provide a

Taking into account the previous mentioned design considerations, the following figure depicts the basic architecture of the Go-myLife platform.

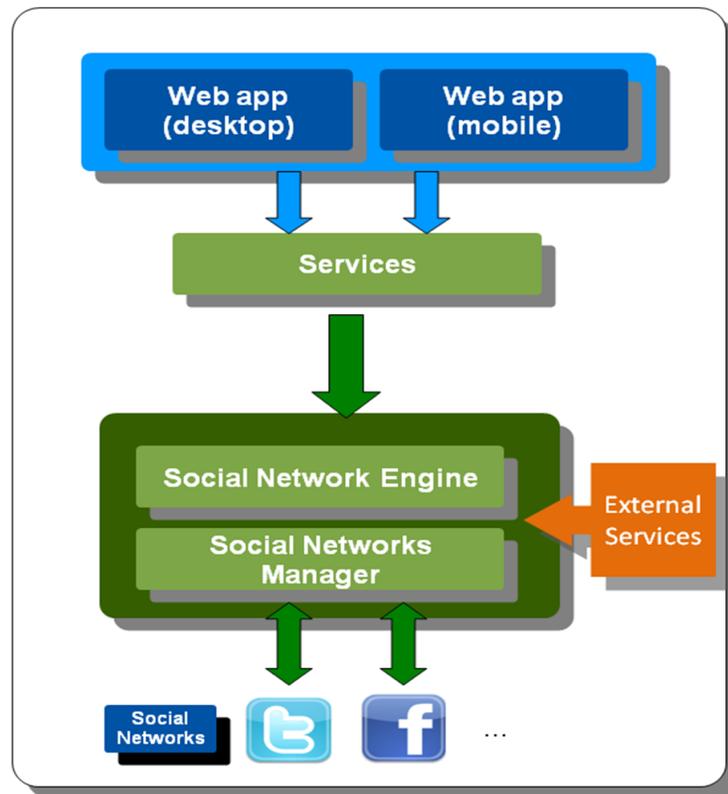


Figure 39. Architectural specifications

Although a web application guarantees interoperability, we need to select one platform to perform the pilot-testing and evaluation workshops (within WP6). The use of the smart phone will require some kind of training for elderly people, so selecting a single model of phone will facilitate this task. We have also chosen Android as the operating system because of the wide range of smartphones at affordable prices that use it.

For more information about the architecture of Go-myLife, please refer to D3.1 Initial Platform Architecture and Design

## 9 Summary

This document discusses the common functionalities of social networks today. These existing social networks perform many different types of functions and are aimed at fulfilling different roles in the lives of their users. Considering all of these, we analysed what are the most typical and useful functionalities needed by the type of people that will use Go-myLife: the elderly. Creating a profile, sharing content, writing messages, etc. are expected functions for the Go-myLife platform that will help the elderly to maintain a more active social life.

We have also analysed what extra functionalities will be added to give Go-myLife an extra value:

- Connections with other social networks: we will build connections between Go-myLife and Facebook and Twitter as they are two of the most successful social networks nowadays. There are other senior social platforms that we have also analyzed and probably relevant for the target group. However, these platforms don't offer a public API to integrate in Go-myLife. By the way, we will build an architecture and structure where it will be easy to include new social networks in the future.
- In this second version of this deliverable, we have also analysed the findings of the user-involvement workshops with older people carried out in the WP2. These workshops pointed out some requirements that we'll need to include in the Go-myLife architecture to fulfil end users' needs. Apart from usability and design guidelines and recommendations, these workshops revealed the importance for local community where users would like to participate and have an active role. Go-myLife will become the access for the local community where elderly could share content and be in contact with other members in an easy way.
- Geolocation will be another extra functionality, not usual in today's social networks. The Go-myLife platform will be used on mobile devices, which currently include various ways of location, either by GPS or Wi-Fi, that will provides contextual awareness regarding who and what is around the user.
- Mainstream social networks are often not user-friendly for older people. A user-friendly interface will be designed taken into account the possible physical and cognitive disabilities of the elderly. Standards for accessibility and usability and a user-centred design methodology will be followed.

This deliverable will be the basis for the D3.3 Final Platform Architecture and Design.

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## List of abbreviations

FLOSS	Free Open Source Software
API	Application Programming Interface
REST	Representational state transfer style of software architecture
GPS	Global Positioning system
WiFi	Wireless Fidelity
IP	Internet Protocol
QR Code	Quick Response Barcode
CMS	Content Management System
AJAX	Asynchronous JavaScript and XML
URL	Uniform Resource Locator
RSS	Really Simple Syndication
WYSIWYG	What you see is what you get
HTML	HyperText Markup Language
IMAP	Internet message access protocol
IM	Instant Message
SMS	Short Message Service
WCM	Web content management system
CSS	Cascading Style Sheets
MVC	Model View Controller
UCD	User centred Design
ISO	International Organization for Standardization
WAI	Web Accessibility Initiative
W3C	World Wide Web Consortium
PC	Personal Computer
WP	Work Package
UI	User Interface
ICT	information/communication technology
JSR	Java Specification Requests
PHP	Personal Home Page / Hypertext PreProcessor
PDA	personal digital assistant
HCI	Human-computer Interaction