



# WeKnowIt

Emerging, Collective Intelligence for Personal,  
Organisational and Social Use

FP7-215453

## D7.1

# Consumer and Emergency Response Use Case Initial Requirements

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### Abstract

This deliverable summarises the user requirements for both the consumer and emergency response case studies, on which the specifications will be based. The deliverable describes the methodology followed in T7.1.1 and T7.2.1 presented along with the prioritised requirements.

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## Executive Summary

This deliverable summarises the user requirements for WeKnowIt case studies, on which the specifications will be based. The deliverable describes the methodology followed in T7.1.1 and T7.2.1, presented along with the prioritised requirements.

WeKnowIt has two use cases to demonstrate the wide applicability of its technologies and research activities:

- An Emergency Response case study, where users can provide intelligence about large scale emergencies both empowering a more effective and informed emergency action, and receiving information on how to act.
- A Consumers Social Group case study providing enhanced publishing tools to support group activities and the ability to extract meta-information from content sources and groups discussions to leverage Collective Intelligence for private, commercial and public purposes.

User studies were undertaken to better understand the current situation in both use cases.

The chosen methodology was user-centred, based on user questionnaires and interviews, to help clarifying:

- Who the users are
- Which are the available data
- What is the environment
- Which are the main tasks
- Which are the information needs

After conducting the user studies and the State of the Art analysis, it became clear that current systems and methodologies do not exploit all the existing levels of intelligence.

Currently emergency response applications are mainly based on personal and organisational intelligence and slowly expanding towards social intelligence. Usually these applications are targeted or to the Emergency Response personnel or to the citizens; the challenge of WeKnowIt is to provide a unified system that targets both citizens and emergency response personnel, providing different functionalities according to the user role.

By exploiting all the intelligence layers, Collective intelligence can help to perfectly match the user needs (of either emergency responders or citizens) by collecting and finding the needed knowledge at the right time in the right modality

In the Consumer Group scenario, the status quo is mainly based upon personal intelligence. Social intelligence is used to analyse the user profiles and the users' travel behaviour to get to know about new trends (in interaction with mass intelligence) and recognize changes in user behaviour and needs. Mass intelligence is also developed, but still at a quite low level.

The main problem of most of the existing travel information and review pages is that information are just tagged and connected to each other manually.

In travelling business, collective intelligence can economically help to perfectly match the customer needs (of either individuals or groups) by analysing existing data with aid of semantic algorithms and to optimize the portfolio of travel agencies. Therewith, a higher degree of customer satisfaction by providing better information can be achieved, which is likely to result in higher revenues due to higher commissions of travel providers.

After the current situation was analysed, a phase of requirements gathering followed, that was conducted using the scenario methodology: different scenarios have been written for each use case, and they were validated during walk through sessions with the users.

Two scenarios were then derived, that clearly indicate the contribution that WeKnowIt is expected to provide and how this is realised through the research activity of the different work packages.

In general, WeKnowIt aims to design, implement and deliver technologies and methodologies that exploit collective intelligence to deliver the right information at the right time to the right person in the right format.

In particular, in the Emergency Response scenario citizens distributed across the region will be able to participate in the monitoring of an incident or event. This will benefit Emergency Response planners that will have real time information available on which they can base their decisions and strategies, enabling them to better react to an Emergency. Moreover, the system will automatically gather information available elsewhere on the network to aid the Emergency Response, thus making possible for an emergency planner to find exactly the needed knowledge amongst all the available information and to selectively make this knowledge available to the citizens (e.g. information about open roads, information about relatives involved, etc.) in a largely automated way. The technologies in use will therefore also encourage and enable dialogue between the Emergency Responders and individuals, groups and communities

For the Consumer Social Group case study WeKnowIt will provide the ability to extract meta-information from various content sources and user generated content within the system and will furthermore provide enhanced publishing tools to support travel activities for single persons

and groups. WeKnowIt will automatically analyze the uploaded content, user's profiles and their actions in order to improve knowledge about the community. Based on the travel behaviour of all users and an analysis of their profiles, WeKnowIt will extract information about the most preferred travel destinations and the trends and changes in user behaviour. This information will be used to make recommendations to the users and support the decision making process before (e.g. destination) and during the trip (e.g. restaurant).

## Abbreviations and Acronyms

<b>PCT</b>	Primary Care Trust
<b>ARD</b>	Association of public service broadcasters in Germany
<b>SY</b>	South Yorkshire
<b>ICP</b>	Incident Control Point
<b>SCG</b>	Strategic Coordinating Group
<b>RVP</b>	Rendezvous point
<b>RCCC</b>	Regional Civil Contingencies Committee
<b>EPT</b>	Emergency Planning Team
<b>NHS</b>	National Health Service
<b>SYP</b>	South Yorkshire Police
<b>GIS</b>	Geographic Information Systems
<b>FLO</b>	Forward Liaison Officer
<b>CYPD</b>	Children and Young People's Directorate
<b>EA</b>	Environment Agency
<b>PC</b>	Police Constable
<b>EOD</b>	Explosive Ordnance Disposal
<b>AIMS</b>	ATLAS Incident Management System
<b>SAFE</b>	Smart Applications For Emergencies

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# 1 Introduction

WeKnowIt has chosen two radically different but complementary use cases to demonstrate the wide applicability of its technologies and research activities:

- An Emergency Response case study where users can provide intelligence about large scale emergencies (e.g. the Kyrill storm which hit Europe in January), both empowering a more effective and informed emergency action, and receiving information on how to act (e.g. how to leave the city, etc.).
- A Consumers Social Group case study providing enhanced publishing tools to support group activities (e.g. organisation of team events), and the ability to extract meta-information from content sources and groups discussions to leverage Collective Intelligence for private, commercial and public purposes.

The two case studies pertain to different topics, target at a wide range of intended users and involve heterogeneous business models.

WeKnowIt will exploit existing expertise and state of the art techniques in personalisation, content processing, data analysis, social analysis and knowledge management, and at the same time, will make a significant step in researching novel methods of extracting Collective Intelligence by fusing information from different sources with emphasis on the user and social content and mass user feedback.

In order for WeKnowIt to be successful much emphasis has been put on the initial requirements analysis, undertaking user studies aiming at gathering requirements from all the user types involved in the use case and at better understanding the applicability of these requirements to the technology providers.

In this deliverable we will describe first of all the two use cases (Section 2), then user studies conducted to investigate the user requirements (Section 3).

We will then present the resulting scenarios that highlight the main technologies and research challenges for the project (Section 4).

To follow a set of user requirements (both functional and non-functional, Section 5) have been identified.

An analysis of the State of the Art for both use cases is then presented (Section 6).

## 2 Use Cases

In the following sections we will introduce the use cases of WeKnowIt: an Emergency Response and a Consumers Social Group case study.

For each use case we will introduce the motivations behind it, the objectives and the involved users.

### 2.1 Emergency Response

There are many different types of emergencies; ones brought about by forces of nature such as avalanches, floods, droughts, earthquakes or man-made emergencies, train and plane crashes, pollution, terrorist attacks. These emergencies can vary in terms of scale both in severity and affected location.

During an incident the emergency response team can potentially receive information from multifarious sources (from the Emergency Services, other local authority bodies, other government bodies, broadcast services, effected individuals, etc.). The seriousness of an incident is likely to increase as its scale and complexity increases, however in such situations it becomes more likely that the amount of information received will become over-whelming.

The Emergency Response Team's decision-making process can, literally, mean the difference between life and death. Primarily this means the allocation and coordination of resources, but also involves effective communication between the agencies involved, the decision/command chain and the effected individuals. The management of the mass of information is crucial in aiding this decision-making, ensuring, as far as possible, that the responders have full Situational Awareness to make informed decisions.

In recent years Information Technology solutions have been increasingly employed to aid in emergency management (see Section 6.1). This document examines the emergency scenario, in particular from the point of view of the Sheffield City Council Emergency Planning and Response Team, to determine how the technologies developed in the WeKnowIt project might aid Situational Awareness, Information Management and fundamentally Decision-Making in an emergency.

Although the concentration of the WeKnowIt technology is on aiding the response activities during the actual emergency incident, the effective handling of the incident should be seen in the context the pre and post incident activities. The UK Governments Dealing With Disasters

guidelines<sup>1</sup> (REF) highlight five activities fundamental to dealing with incidents:

- *Assessment*: of responsibilities and risk of potential threats or hazards.
- *Prevention*: adoption of measures that aim to eliminate, isolate or reduce those risks as far as is reasonably practicable.
- *Preparation*: involves planning, training and exercising.
- *Response*: aims to deal with the first effects where collaboration, co-ordination and communication are vital.
- *Recovery* management: encompasses the physical, social, psychological, political and financial consequences of an emergency.

The Emergency Response case study aims to develop technologies and interaction modalities to better support professional users (i.e. Emergency Response personnel) and citizens involved in an emergency, by providing means to intelligently gather and reuse available knowledge, thus empowering a more effective and informed emergency action.

The case study will be based on the research results of all Intelligence Layers, with Media, Mass and Social Intelligence analysing the user-submitted content, Personal Intelligence allowing easier upload and distribution of content to the end users and Organisational Intelligence providing all the extracted knowledge to the Emergency Responders.

The Emergency response case study can benefit from the participation to the project of the Sheffield City Council Emergency Response Team: more details on the Emergency Response process, team and on the specific examples chosen, the users and roles, the data and the vision are outlined below.

### 2.1.1 What happens during an emergency

In the following diagram (Figure 1) an abstract view of what happens during an emergency is shown.

First of all an emergency service (Police, Fire brigades, City Council) is notified that an emergency has happened so it can be decided which resources should be allocated where and which resources should be mobilised (for example the Fire Services will decide how many units they will send on the scene).

Then two types of responses are elaborated:

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<sup>1</sup> Dealing With Disaster – Revised Third Edition – Cabinet Office - 2003  
<http://security.homeoffice.gov.uk/news-publications/publication-search/guidance-business/dwdrevised1.pdf?view=Binary> [Accessed 24/09/08]

- An initial response that deals with the immediate actions necessary to rescue the situation
- A considered response, that is about planning strategies to deal with the aftermath of the emergency



Figure 1 - What happens during an emergency: a timeline

In UK the management of the response to emergencies will normally be undertaken at one of three ascending levels; operational, tactical and strategic or bronze, silver and gold respectively.

### 2.1.2 Emergency Response Organisations

Throughout the world centralised planning exists to handle emergencies with largely similar organisation: in the United Kingdom emergency response is generally conducted at the local level.

In Greece the main organisations working to prevent Emergencies are the General secretariat for civil protection (GSCP)<sup>2</sup> and the Crisis Management Team (CMT)<sup>3</sup>.

Civil Protection (CP) aims to the protection of citizen's life, health and property from natural hazards, technological accidents (including biological, chemical and nuclear threats) and other disasters, causing emergency situations during peace period. The scope involves also the protection of cultural heritage, historical buildings and monuments. In

<sup>2</sup> <http://www.civilprotection.gr>

<sup>3</sup> <http://www.odik.gr>

general, the main task of Civil Protection is the minimization of catastrophe consequences.

The General Secretary for Civil Protection leads the GSCP and he is authorized, among others, to:

- Coordinate the CP actions during disasters
- Propose to the Minister the declaration of the state of emergency in case of national scale disasters
- Declare the state of emergency at regional and local level
- Coordinate the assistance provided from abroad.

Volunteer organizations have a significant role in emergencies. Giving emphasis to the assistance that volunteers can provide during major emergency cases, GSCP set in 2001 the basis for a National System for Volunteer Organizations in the field of Civil Protection. The system aims to:

- Development of a voluntarism program throughout the country
- Creation of a Task Force coordinated from GSCP and consisting of specialized and experienced volunteers
- Creation of a volunteer organizations database. Up-to-date 84 volunteer organizations, numbering a total of 70,000 members, have been selected for the system
- Implementation of pilot programs for promoting voluntarism in specific areas.

The Crisis Management Team (CMT) deals with humanitarian crises management in accordance with UN standards in Greece and abroad. The central government organization is based in Thessaloniki where member and citizens' coordination and information is performed.

The team is composed of sensitive and special volunteers that are ready to go to any area affected by disaster at any time. The people of the team are volunteered on the assistance, prevention, treatment and restoration of mass destructions.

The web site visitor can also be informed about the weather forecast and get measurements for meteorological stations for all over the country, earthquake activity (almost in real time) and get a daily Forest Fire Danger Forecast

In Germany there are several organisations that deal with Emergency Response, amongst these:

- Federal Office of Civil Protection and Disaster Assistance (BBK)<sup>4</sup>

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<sup>4</sup>[http://www.bbk.bund.de/cln\\_027/nn\\_402322/EN/00\\_\\_Home/homepage\\_\\_node.html\\_\\_nnn=true](http://www.bbk.bund.de/cln_027/nn_402322/EN/00__Home/homepage__node.html__nnn=true)

- Federal Agency for Technical Relief (THW)<sup>5</sup>
- German Institute for Disaster Medicine and Emergency Medicine<sup>6</sup>

### 2.1.2.1 Sheffield City Council Emergency Planning and Response

In Sheffield an Emergency Planning team is operating in the Sheffield City Council to help to prevent and react to emergencies.

Please see Appendix **Error! Reference source not found.** for more details on the Emergency Response Management in Sheffield, gathered during user interviews.

In order to improve their Emergency Response the Sheffield City Council emergency planning team proposed the case study for the WeKnowIt project which will replicate the June 2007 floods in Sheffield.

On the 25-26 June 2007 Sheffield was flooded as the River Don burst its banks causing widespread damage in the city.

The 2007 floods involved a wide ranging response including three emergency services, the Environment Agency, Highways Agency, three utility companies, the health agencies, voluntary agencies and local authority. The impact of the floods was recorded by South Yorkshire Police, national and local TV, Sky News and local authority CCTV and Traffic cameras.

In addition the above organisations all kept logs of their actions and of calls made/received.

This example of an emergency involving a large number of organisations and the general public is ideal for WeKnowIt, as it allows illustrating the actions and decisions that are taken during an emergency using real data (see Section 4.1.2).

Sheffield Emergency Planning Team members involved in the project are all experienced emergency planners and have been involved in the response to many different emergencies. They all have considerable experience of working in the emergency planning role and were involved in the floods in June 2007.

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<sup>5</sup>[http://www.thw.bund.de/cln\\_035/nn\\_244766/EN/content/home/home\\_\\_en\\_\\_node.html\\_\\_nnn=true](http://www.thw.bund.de/cln_035/nn_244766/EN/content/home/home__en__node.html__nnn=true)

<sup>6</sup> <http://www.disaster-medicine.de/index.php?site=3&lang=en>

### 2.1.3 Roles and Users

A number of roles and users (actors) within the context of an emergency response situation can be identified:

Abbreviation	Actor	Tasks and Rights
ER	<b>Emergency Response Team members</b>	Experienced personnel involved in all the command structures
FLO	<b>Forward Liaison Officer</b>	Experienced personnel sent on the scene of the emergency to communicate with the ER team
SLO	<b>Specialised Liaison Officers</b>	Experienced personnel sent in particular key locations or structures (e.g. train station) to coordinate actions with the ER team
CA	<b>Contact centre</b>	A contact point for the public that will deal with information requests and advice. It is possible that a unique contact point is created, or there may be separate contact centres for services like Police, Fire, City Council, etc.
C	<b>Citizen</b>	Citizen involved in an emergency
PO	<b>Police officer</b>	Police Officer involved in an emergency
FO	<b>Fire officer</b>	Fire Officer involved in an emergency

**Table 1 - ER users and roles**

### 2.1.4 Data

A wide variety of data is collected during an emergency.

In the following we will identify the main document types, and for each document type we will briefly describe the content and the format, provide an example if available, and illustrate its role inside the emergency response process (who produces it, who consumes it).

#### **Event Log**

The Event Log is a Timeline of events with all the actions taken, who did what and any comments inserted from the authors.

They are very long documents, usually produced during the event by a number of authors that collate contributions from each user personal log. Event Logs are then re-used after the emergency during debriefing sessions for lessons learnt or for eventual later enquiries.

Event Logs are structured like a scenario, generally they contain a table with 4 columns like:

- Time
- From/To
- Message Details
- Actions

Abbreviations are used in the document but gazetteers at the beginning of other documents can be used to interpret the event logs.

#### **Police Event Log**

The South Yorkshire Police Event Log is the output of a database system used by call centre handlers to record logs of events.

In this type of document acronyms are banned and in general normal text is preferred.

The log is generally produced by one call handler, but can be produced by many authors if anything needs to be added after the first call or if the call needs transferring.

Is it used both for helping emergency but also as audit trail.

#### **Fire Services Log**

The Fire Services Log is very similar to the South Yorkshire Police Event Log as it is the output of a database system used by call centre handlers to record logs of events.

The log is generally created by the call handler, with the possible intervention of the supervisor, that has the right to intervene in the conversation and modify the log.

Is it used both for recording exactly what happens, establishing the best response, managing the units that get sent out but also as audit trail.

## Images

Images of the emergency can be collected by FLO sent to the emergency scene, by CCTV workers or by other emergency workers; other images may be collected by citizens that happen to be involved or near an emergency. Often images collected by the public are shared using websites like Flickr, Facebook, BBCNews.

During the Sheffield 2007 floods many images were collected by SCC workers (see **Error! Reference source not found.** for an example).

Images are used by the ER personnel to better understand the extent of an emergency. They are also used in debriefing sessions.

## Videos

Videos of the emergency can be recorded by CCTV cameras that are present all over the city; other videos may be recorded by news operators or citizens that happen to be involved or near an emergency.

Often videos recorded by the public are shared using websites like YouTube, Flickr, Facebook, BBCNews.

Videos are used by the ER personnel to better understand the extent of an emergency. They are also used in debriefing sessions.

## Audio

Audio files have been recorded by Fire Services, containing calls made by citizens to request help.

Audio calls are stored for 3 years after the emergency, mainly as audit trails.

### 2.1.5 Vision

With the increased use of mobile devices and digital cameras, people have become accustomed to capture events and share the information (e.g. the

BBC news website for contributing to the news by uploading pictures or comments).

Moreover, the emergence of new technology achievements in the mobile network communications has always been an essential motivation for novel commercial applications and consumer services. Breakthroughs in increasingly faster and more reliable wireless transmission of data, as well as the evolving capabilities of new mobile equipment designs have permitted the provision of online web services at an 'anywhere and anytime' availability. Modern concepts and trends on community-customised Web 2.0, social-networking and social tagging shape a new perception about network-exchanged services, which can be incorporated in portable miniature handheld devices that are becoming even more inseparable companions to most people nowadays. Many web communication portals for community services (e.g. MySpace.com, Facebook.com, Twitter.com, etc.) are enjoying an ever increasing and unprecedented popularity and also can be used from mobile phones via a WAP interface.

In addition, new mobile features of accurate enough positioning capabilities have introduced novel services which exploit information about the presence of the users, thus opening up new market opportunities. Examples of such location-based applications (LBA) are given, as follows:

Emergency	
○ E911	• Games
○ E112	• Location-Sensitive Advertising
○ Navigation	• Billing
○ Directional	○ Road Tolling
○ Assistance	• Social Networking
• Informational	○ Friends
○ "Find My Nearest"	○ Tagging
○ Location Relevant Content	• Handset Locator
▪ Weather	• Voice Replacement
▪ News	○ Call for a taxi
	• Tracking
	○ Child Locators
	○ Asset Tracking

**Table 2 - Examples of LBA**

**What is the impact of collective intelligence in emergency response?**

Currently emergency response applications are mainly based on personal and organisational intelligence and slowly expanding towards social intelligence.

Most of the resources that are available can be categorised in two types: websites for citizens caught in an emergency and resources for emergency planners.

As explained in Section 6.1 many of these available resources are simply a collection of pre-compiled documentation about emergencies (checklists, guides etc.). Recently more advanced technologies are emerging that make use of Web 2.0/social network features to empower the citizen that needs information during an emergency.

As for the emergency responders, again most resources are pre-compiled websites or specific incident management systems. Currently some systems (mainly target to ER personnel) make use of media intelligence to improve the quality of the information presented (see Section 6.1.3), while social intelligence is not yet well exploited in this area.

The challenge of WeKnowIt is to provide a unified system that targets both citizens and emergency response personnel, providing different functionalities accordingly to the user role.

WeKnowIt will make use of personal intelligence, offering functionalities for both user types for uploading content (text, images, video), tagging it and accessing it (by browsing and searching).

Moreover, WeKnowIt aims to deliver a multimodal system, that can be used in different circumstances with different devices (i.e. mobile phone, PDA).

By exploiting all the intelligence layers Collective intelligence can help to perfectly match the user needs (of either emergency responders or citizens) by collecting and finding the needed knowledge at the right time in the right format.

WeKnowIt aims to design, implement and deliver technologies and methodologies enabling citizens distributed across the region to participate in the monitoring of an incident or event. This will benefit Emergency Response planners that will have real time information available on which they can base their decisions and strategies, enabling them to better react to an Emergency. Moreover, the system will automatically gather information available elsewhere on the network to aid the Emergency Response, thus making possible for an emergency planner to find exactly the needed knowledge amongst all the available information and to selectively make this knowledge available to the citizens (e.g. information about open roads, information about relatives involved, etc.) in a largely automated way. The technologies in use will

therefore also encourage and enable dialogue between the Emergency Responders and individuals, groups and communities

## 2.2 Consumer Group Study

The aim of the Social Group case study is to employ WeKnowIt technologies to extract and manage knowledge about communities, their experiences and the content they create and share; thus, WeKnowIt moves content sharing towards a group-centric view.

The case study of the consumer social group is the implementation of a travel planner and guide.

Travel planning has become a major activity that people tend to do more and more by themselves instead of relying on the advice and experience of one travel agent.

In the recent years, with the advancement of digital services and their wide-spread adoption, there is a high amount of information available on the internet that can help planning a travel.

During holidays, people take pictures and record videos and they often share them on Flickr, YouTube etc. Moreover people tend to post reviews of the places they have been (cities, restaurants etc.) and to post narrations of their holidays on blogs.

WeKnowIt can automatically analyse the uploaded content and users profiles and actions through the Personal, Media, Mass and Social Intelligence Layers, in order to extract the available knowledge.

This application is intended as a travel advisor to be used during the whole lifecycle of a trip: from planning until the end of it (Figure 2). It will draw travel-related information from multiple sources, such as: history of previous trips (including information extracted from trip reports, like photographs, videos, or text and voice annotations), user feedbacks from blogs about visits of other people, or information available in the internet. Analysis of this information at different levels of intelligence leads to collective intelligence that can assist the service users in deciding and scheduling their future trip. This will be based on user-posed criteria, such as destination preferences, time-of-the-year suggestions, social group members with whom to travel, logistics and cost of travel and stay, special enquiries about events, attractions, museums, restaurants, shopping, nightlife, etc.

At the time of their trip, the users can ask the system for recommendations about specific locations, events, etc., also with reference to the vicinity of their current location. Besides, they can use

their mobile devices in order to capture particular moments of their trip (through photos, video footages, annotations, etc.). Once the trip comes to an end, the users can post their report about their trip experience, at the ease of their desk, for instance. This information will feed the system with new material to be processed and analysed, for future trip planning.

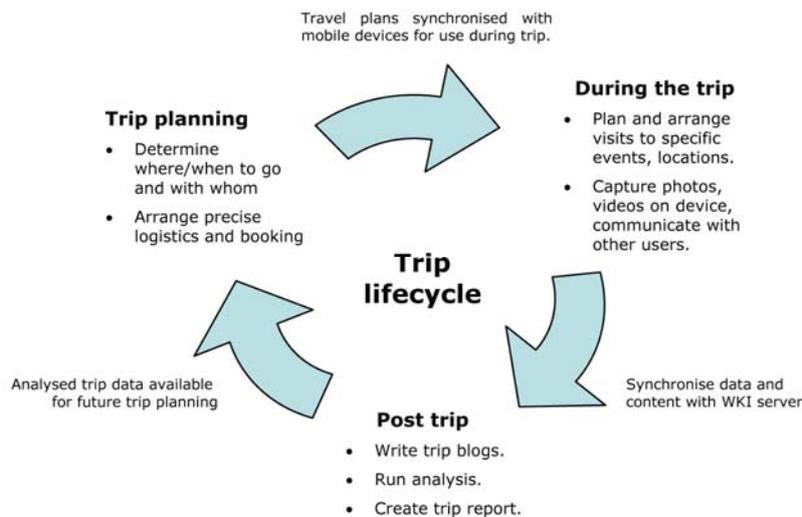


Figure 2 - Travel trip lifecycle

### 2.2.1 Market Analysis

To analyze the Online Travelling Market properly, it should be differentiated between two different types of homepages: Those which are Web 2.0 based and the commercial shop solutions. This analysis will take into account six major types of homepages, four of them are Web 2.0 based and two of them can be referred to as "traditional travel sites" with a commercial main concern.

Regarding Web 2.0 based websites, these four major types can be made out:

1. **Blogs** are focusing on sharing information with your family and friends to let them know where you are and what you are doing.
2. **Travel information and reviews** aim at creating travel guides or wikis based upon the input of their users. Travel reports, photos, videos and audio files can be uploaded and tagged. Hand in hand with reviews on hotels, restaurants and airlines, a virtual travel guide should be created in the long-run
3. The intention of **Social Networks** is twofold: On the one hand there are various websites to connect people who are planning to go on holiday, either in terms of travel partners from their origin or in

terms of a local travel guide from their destination. On the other hand there are platforms which support organizing group vacations by creating a homepage and uploading information on the latest plans. An additional benefit is keeping up with your friends

4. **Travel Information and Social Networks** is a combination of the second and third type. Information on your former travel destinations and places of interest can be published by uploading reports, photos, videos and audios files. Based upon these information, which are organized according to topics, contacts between users with the same interest can be established and users can keep in touch with their friends

Taking a closer look at the traditional, commercial sites, two major types can be found:

1. **Travel Agencies and Travel Guides** provide information on the destinations with a commercial purpose. Travel sites such as [www.expedia.de](http://www.expedia.de) or [www.travel-overland.de](http://www.travel-overland.de) offer the infrastructure to book flights, hotels and rental cars as well as get information on the different airlines and hotels, so their main purpose is the infrastructure needed when travelling. Travel guides such as Marco Polo mainly provide information on the destination itself, e.g. famous sights or things to do. Their purpose is earning money by making the user buy the “paper version” of the travel guide if they are satisfied with the content of the online version.
2. **Mobile technologies** are still at a quite rudimentary level up to date. There are already mobile travel guides which can be downloaded on your mobile device. The ADAC is even taking it a step further and makes your mobile locate your position with aid of GPS and gives suggestions on what to visit next or where to park your car.

In Appendix Section D. some examples of relevant websites are shown.

## 2.2.2 Roles and Users

The number of different user roles (actors) for the Consumer Social Group Case Study is quite similar to other web based systems. The following table shows the main types:

Abbreviation	Actor	Tasks and Rights	Additional Information
G	guest	view all public parts of the system, register	not registered, no login
U	user	login, edit personal information, personalize the system, collect material on a personal workbench, invite others	registered person that has an active login for the system
O	trip organizer	user + owns a trip workbench and can gain access to other users (assign sub tasks)	registered user that actually plans a trip with the system (special type of the "user" role)
M	moderator	user + ability to change user generated content and delete improper content	registered user with enhanced rights
A	administrator	access to the administration system, add, change and delete user profiles and all user generated content	not registration for the system required, only internal staff will have these permissions

**Table 3 - User Roles for Consumer Social Group**

A detailed description of the user roles and their specific rights and attributes will be available in the product specification document D7.2.

### 2.2.3 Data

During a holiday people collect different types of data. The most common ones are:

#### Images

Most photos are taken with analogue or digital cameras. For quick snapshots and because it is available anytime the tourists use their mobile. Images that were taken with a mobile can be GPS tagged automatically. The GPS information is stored as metadata. The image processing is done later, at home.

There are many existing image sharing platforms where tourists upload their photos. While uploading the images to such platforms like Flickr the user is asked to tag the photos and locate them if there are no geo location metadata available.

#### Videos

Larger videos are usually taken with special cameras. Short clips can be made with a mobile. The videos from the mobile camera are low quality and rather short. Digital holiday videos are mostly edited with special tools at the computer.

#### Textual Information

Some tourists write own travelogues to remember their experiences and describe what happened when to create travel diary.

#### GPS-Tracks

New mobile phones and PDA offer the possibility to record GPS tracks with special software programs.

### 2.2.4 Vision

The European Online Travel Market continuously grows each year. More and more travel information websites, hotel ratings and holiday booking agencies evolve and it becomes extremely complex for people to search, find and organize their trips without visiting numerous sites. On the other hand these people will collect lots of information during their own holiday that will be shared with others via the internet. They take photos and videos with their cameras or with their mobiles that are also able to add geo location information, record voice messages and write travelogues or diaries. Thus they participate in the growth of content and information within social networking platforms.

The Consumer Social Group case study will provide the ability to extract meta-information from various content sources and user generated content within the system and will furthermore provide enhanced publishing tools to support travel activities for single persons and groups. WeKnowIt will automatically analyze the uploaded content, user's profiles

and their actions in order to improve knowledge about the community. Based on the travel behaviour of all users and an analysis of their profiles, WeKnowIt will extract information about the most preferred travel destinations and the trends and changes in user behaviour. This information will be used to make recommendations to the users and support the decision making process before (e.g. destination) and during the trip (e.g. restaurant).

### 3 User Studies Analysis

*In order to better understand the case studies, user studies were organised and carried out.*

*This chapter reports about the user studies undertaken at the beginning of the project when it was necessary to understand how information is accessed and shared and how users perform their tasks ensuring their everyday activities.*

*In the following sections we will present first of all the methodology followed for each use case and then the results of the user studies.*

#### 3.1 User-centred design methodology

Designing with a user-centred approach requires the involvement of the user from the very beginning as it is fundamental to understand the reality of what are people doing, how, when, and why.

A user-centred design approach often works by trying to answer typical questions like who are the users, which are the user tasks and goals, what information do the users need and so on.

Therefore when starting a project aiming to adopt a user-centred design approach the first phase is to gather the necessary understanding of the users and their needs in order to formulate an initial list of requirements.

As outlined by Benyon [1] requirement analysis is particular important when dealing with intelligent systems as WeKnowIt is aiming to, as they involve a higher number of features than traditional systems. Benyon [1] highlighted five different analyses that are fundamental when designing intelligent systems: 1) functional analysis; 2) data analysis; 3) task knowledge analysis; 4) user analysis; 5) environmental analysis.

All these activities need to be carried out to be able to translate the abstract requirements into concrete descriptions that feed directly the prototype.

To perform the user analysis, the task knowledge analysis and the functional analysis the chosen methodologies were interviews and questionnaires (further detailed in the Sections related to each use case); for what regards data analysis data samples were collected and analysed with the support of expert users. The environmental analysis was achieved through direct observation during interviews and meetings.

As tool for the description of the requirements of an interactive intelligent system we have adopted faceted-scenarios [2].

As stated by Carroll [3], a scenario is a story describing a person with specific characteristics and motivations who performs a specific task by interacting with a specific system.

The basic idea of scenarios has been refined in [2] to include all the facets of a complex discussion among partners:

- **Timeline:** the activity described in the scenarios may last for many months and includes many interaction and communications; the timelines show how the interaction and communication evolves.
- **Narration:** is the description of the user and his/her interaction with the system.
- **Rational:** contains the descriptions of the technical motivations/functionalities that support the interaction as described in the narration.
- **Questions:** this column lists the questions to be passed among the X-Media teams; in particular it has been useful to communicate to Area 2 assumptions taken by Area 1 on the system's capabilities;
- **Interface:** indexed the screenshot mock-ups that complement the scenario.

### **3.1.1 Emergency Response**

#### **3.1.1.1 Users**

The first step was to identify the potential users of the Emergency Response use case:

1. Emergency Response Personnel
2. Citizens involved in an emergency

After the two main classes of users were identified the recruitment activity started. The Emergency Response Personnel were recruited through SCC, a partner in the project that helped providing expert time from SCC users and contacting expert users from other organizations (Police, Fire Services).

For what regards the second class of users, citizens involved in an emergency, the choice has been to recruit citizens that could be particularly sensitive to the issue by contacting people that were involved in the Sheffield 2007 floods (more details in Section Data Collection and analysis).

#### **3.1.1.2 Data Collection and analysis**

Detailed interviews with emergency response staff (SCC, Police, Fire Services) were conducted to understand the emergency process, their tasks and goals, and understand the environment in which they work.

An analysis of the available data was carried out to map the information flow.

In order to collect quantitative feedback about the citizens' experience during the Sheffield 2007 floods, a website was created in occasion of the first anniversary (see Figure 3).



**Figure 3 - WeKnowIt website for the anniversary of the Sheffield Floods**

A questionnaire was posted on the website: the participants were asked to fill in some personal information and to answer some questions about their experience during the floods (see Figure 4).

The questions were focused on understanding how citizens react when involved in an emergency and how do they use (if they do) information technologies in such situations.

In particular we were interested in understanding if participants

- Contacted an emergency service and if yes, how;
- Contacted friends or family and if yes, how;
- Used mobile phones or cameras to take pictures or videos of the emergency;
- Shared the content using online services.

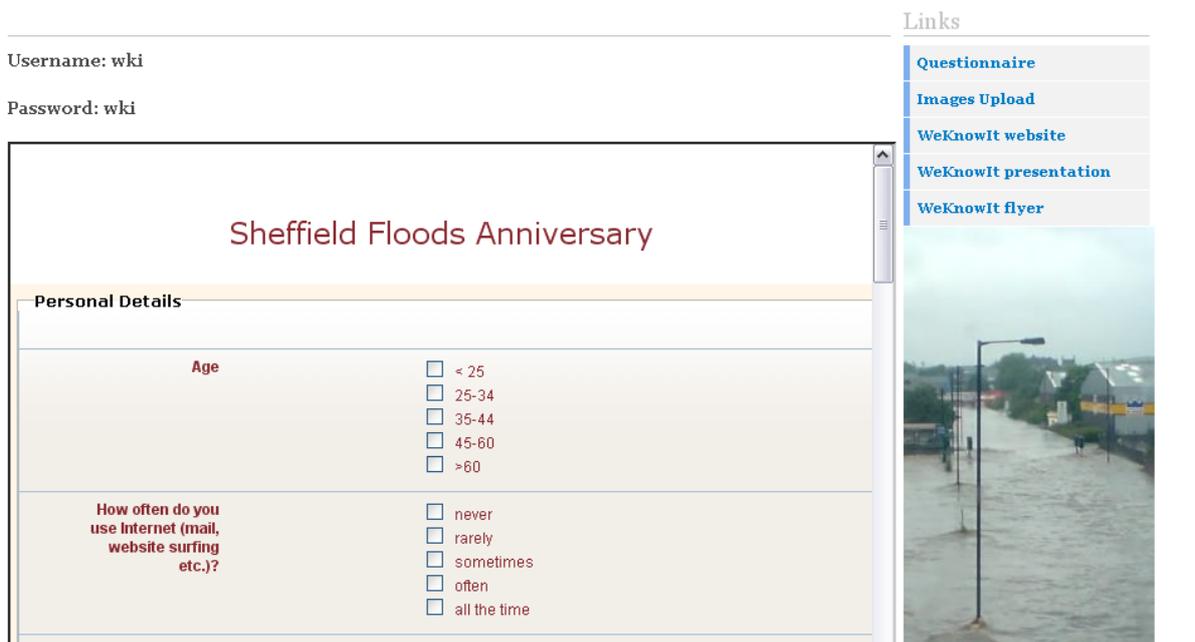
These data were correlated with personal information about the users, as

- Familiarity and use of Internet
- Use of
  - social networks (e.g. Facebook, MySpace)
  - news websites (e.g. BBCNews, SheffieldForum)
  - online sharing websites (e.g. Flickr, YouTube)

The link to the website was advertised on social networks (Facebook group), forums (Sheffield Forum) and specialized publications (E-Response Sheffield Newsletter). Questionnaires in printed form were also collected in several pubs around the city during the Sheffield Flood Anniversary Festival.

For more details on the questionnaire see Appendix, Section A.

### Sheffield Floods Anniversary



**Figure 4 - The Sheffield 2007 Floods Questionnaire**

The results of the questionnaire have been analysed and a small sub-sample of users has been chosen for more in depth interviews about their experience. This in depth interviews have been carried out as one to one interviews.

### 3.1.2 Consumer social group

#### 3.1.2.1 Users

For a proper analysis of the target group for the Consumer Social Group use case it is necessary to identify sub groups. The potential end users of the Consumer Social Group use case are people that are somehow connected with the planning or organisation of a trip, people that are currently on vacation and have an information need or people that want to archive and share their experiences and photos / videos they have gathered during a vacation. In addition to these consumer groups the organisational part of the system will also be connected with travel agencies and service providers such as travel agents should also be considered for the user studies.

The target group and the scope of the system led to the following subjects for the user interviews:

1. Trip planning and travel preferences
2. Media sharing and social networking
3. Service Provider experiences

After the identification of the main topics for the user studies the recruitment started. The users for the trip planning workflow interviews were recruited by LYC and are partly LYC employees and related friends or family members. The sample includes slightly more males (7) than females and the average age of the population is 31.5 years (24 to 45 years). About 50-60% of their annual vacation is spent on holiday and for some people (3) even 100%. The internet is used intensively at work and / or at home by the whole population. Most of the people have at least 10 years of internet experience and consider themselves as an expert in this field (9). The most frequently used services are e-mail, instant messaging, search engines, online lexicons, news sites and online banking. For more detailed results on trip planning and travel preferences interviews see Section 3.3.

The interviews focussed on the media sharing and social networking were carried out by MOT, a partner in the project which has left the consortium. For the interviews they choose experienced users that have already used social networking tools and that are also interested in travelling and plan a trip for the next months.

For the third part, the Service Provider experiences LYC has carried out an interview with four Travel Channel managers from the German, French

and UK Travel Channel. The LYCOS Travel Channel<sup>7</sup> is a service operated by LYC that offers information about travel destinations, useful services (like translation tool and route planner) and hotel ratings. Most content is exclusively written for LYC or comes from an external partner such as the hotel ratings and the translation tools. The exact feature set differs from country to country because of local differences in negotiations and content suppliers.

### 3.1.2.2 Data Collection and analysis

The interviews focussed on travel preferences and the planning workflows were conducted first. This was necessary to get a better understanding about the decision process and the different trip phases. A questionnaire was created for a qualitative analysis with a manageable group of users. The interviews were carried out in spring 2008 and the evaluation was done anonymously. At the beginning of the interview the participant was asked for some personal information about

- Gender and age;
- Marital status;
- Familiarity and internet usage;
- Average time spent on holiday of the annual leave

The majority of the questions were focused on understanding which kinds of holiday are preferred and which decisions and information sources are important for the planning process.

The following issues were of special interest for us:

- Travel preferences in general and last 3 destinations visited;
- Information sources and planning behaviour;
- Effort and efficiency of the planning phase;
- Trust in travel agencies, booking services;
- Information needs during trip phase;
- Media sharing and travel community experiences.

For detailed information on the questionnaire see Appendix (Section F).

After the analysis of the first interviews, a second round was started by MOT to find out more about the content sharing experiences and behaviour of the potential users. In particular we were interested in:

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<sup>7</sup> <http://www.LYCOS.de/reise>, <http://www.LYCOS.co.uk/travel>,  
<http://www.voyage.LYCOS.fr>

- Social networking tools and familiarity with content sharing in general;
- Usage of cameras and sharing of self-made pictures / videos;
- Interest and trust in automatic analysis and recommendations;
- Sharing content on the move.

The questionnaire is available in the Appendix, Section H.

For the service provider interviews, the questions were collected by the Work Package 7 partners and the interviews were conducted by LYC. The main topics that we have discussed are:

- Usage patterns, experience with user generated content and data analysis;
- Navigation flow and cross-selling activities;
- Mobile access, personalisation and recommendation.

For more details on the questionnaire, see Section C. in the Appendix

## 4 Scenarios

### 4.1 Emergency response

In the following sections we will first of all describe the personas used for the Emergency Response Scenario, and then we will illustrate the scenario itself, following the methodology described in Section 3.1).

#### 4.1.1 Personas

The example personas for the Emergency Response scenario cover the variety of roles involved in an emergency response exercise. Four main types of users should be considered:

				
Name	John	Lucy	Andrea	Mark
Age	48	42	29	33
Location	Sheffield, UK	Sheffield, UK	Sheffield, UK	Doncaster, UK
Social Life	He is married, has one children aged 8.	She is married and has 2 children aged 6 and 8.	Andrea is single and she lives in a flat in the city centre. She is active in several charities and spends her free time with friends.	He lives with his girlfriend and a dog in a small house in the outskirts of Doncaster.

Work Life	<p>He is a member of the Emergency Planning Team in Sheffield.</p> <p>His task is to plan the resources and strategies to best answer to emergencies on the territory.</p> <p>He also takes care of the recovery phase.</p>	<p>She is a member of the Emergency Planning Team in Sheffield.</p> <p>Her task is to plan the resources and strategies to best answer to emergencies on the territory.</p> <p>She also takes care of the recovery phase.</p>	<p>She is a Forward Liaison Office for the Sheffield City Council</p>	<p>Mark works for an IT company as web developer.</p>
Internet Knowledge	<p>His PC and internet knowledge is advanced and he uses the internet both during his work and at home. He likes to take photos in his free time and shares them with his family and friends.</p>	<p>Her PC and internet knowledge is very advanced but she uses PC and IT technologies only during her work time.</p> <p>She is a frequent user of mobile phones but mainly for work matters.</p>	<p>Andrea does not use PC or internet very frequently, apart for her job on occasions. She uses her mobile phone very often to take photos and videos.</p>	<p>Mark owns a mobile phone with a camera and Wi-Fi connection and it is a high user of Internet, email, social networks both at home and at work.</p>
Favourite Sites	<p><a href="http://www.apple.com">http://www.apple.com</a></p> <p><a href="http://theguardian.co.uk">http://theguardian.co.uk</a></p>	<p><a href="http://mail.google.com">http://mail.google.com</a>;</p> <p><a href="http://www.sheffield.gov.uk">http://www.sheffield.gov.uk</a></p>	<p><a href="http://www.ebay.co.uk">http://www.ebay.co.uk</a></p> <p><a href="http://www.savethechildren.co.uk">http://www.savethechildren.co.uk</a></p> <p><a href="http://www.vogue.co.uk">http://www.vogue.co.uk</a>;</p>	<p><a href="http://www.flickr.com">http://www.flickr.com</a></p> <p><a href="http://www.facebook.com">http://www.facebook.com</a></p> <p><a href="http://mail.google.com">http://mail.google.com</a></p>

#### 4.1.2 Scenario

The ER scenario is set in Sheffield on the 25th of June 2007.

John, Lucy and Andrea are at their workplace in the Sheffield City Council when the water starts to rise in the River Don.

Mark, a Sheffield citizen, is caught up in the floods while going back home from his workplace.

This scenario has been created following the methodology described in 3.1 with particular attention on the project cooperation, inserting a column, called WP interaction, in which is detailed which work package is involved at every step and how; the version reported here does not have a “questions” column as that was used during the scenario development and evaluation but not relevant for the final version.

The scenario has been evaluated during walk-through sessions with members of the Emergency Response Team in Sheffield and with citizens.

The detailed scenario has been removed from the public version.

## 4.2 Consumer social group

For about 80 percent of the people with access to the internet the www constitutes an important information source while planning a journey. More than 50 percent already have experiences in booking travel related products through the internet [4]. The travel affine user groups in the internet show a balanced gender proportion and well allocated age groups. More than two thirds of them are employed and about one third has a monthly income of more than 3.000 Euros. These characteristics show the attractiveness of the online travel market [5].

Around 57 percent of the people that are using the internet to find travel information mostly visit search engines to find certain offers and to get an overview of potential interesting websites. But more than 40 percent have already bookmarked a certain website they visit when searching for travel information. The top three information sources of the target group are: 83 percent internet, 75 percent own experience, 70 percent experience of fellows / relatives [5]. These users need a system that combines all three - algorithmically search results (pure information), storage for own experience (remember and share with others) and opinions and experiences from other users.

### 4.2.1 Personas

Due to the variety of the target group the example personas should be also very different and cover a wide range. Three different types of users should be considered:



Name	Albrecht Schmidt	Susan Jones	Marc Varet
Age	49	17	28
Location	Germany	UK	France

Social Life	He is married, has two children that are older than 20 and have already left the household.	She has no partner and lives with her parents in a small flat. Susan spends her free time with friends - some other trainees.	He is not married but has a girlfriend. They live together with the girlfriend's 3 year old daughter.
Work Life	He works in a public library and is responsible for including new books to the inventory. Therefore he makes heavy use of PC techniques.	She works currently as a trainee in a bank. Her main tasks are to advice customers and sell bank products.	He is a car dealer and just started his own business. His girlfriend is responsible for the accounting of the company.
Internet Knowledge	His PC and internet knowledge is advanced but he uses the internet mostly during his work. He likes to take photos of everything in his free time and shares them with his family and friends	Her PC and internet knowledge is very limited and she hates to spend much of her free time to sear for information Susan uses her mobile phone very often and takes small photos and videos of her friends.	He is very experienced with PC and internet and he has build up his own website to offer used cars. He often uses his PDA to check his emails and the latest offers from other vendors.
Favourite Sites	<a href="http://www.spiegel.de">http://www.spiegel.de</a> ; <a href="http://www.n24.de">http://www.n24.de</a> ; <a href="http://www.flickr.de">http://www.flickr.de</a>	<a href="http://www.glamourmagazine.co.uk">http://www.glamourmagazine.co.uk</a> ; <a href="http://mail.google.com">http://mail.google.com</a> ; <a href="http://www.ebay.co.uk">http://www.ebay.co.uk</a>	<a href="http://www.moniteurauto.fr">http://www.moniteurauto.fr</a> ; <a href="http://www.autojournal.fr">http://www.autojournal.fr</a> ; <a href="http://www.zdnet.fr">http://www.zdnet.fr</a>

Scenarios:

- Albrecht wants to visit a European city with his wife and some colleagues from the university in autumn. It should be not too warm and crowded but quite interesting because of the various people in the group.
- Susan wants to organize a single graduation trip for the next summer. She wants to have good weather, much fun and her budget is very limited.
- Marc wants to have a relaxing short trip to a place where the whole family can have fun and it should be not too far away for the little child.

## **4.2.2 Scenario – Reunion City Trip**

The detailed scenario has been removed from the public version.

### **4.2.2.1 Pre-trip planning**

Albrecht, Bernd, Claudia, Dieter, Erika, and Felix are a group of friends living in different cities in Europe such as Cologne, Munich, and Paris. They know each other from university and would like to meet for a reunion during a one-weekend city trip.

### **4.2.2.2 During the trip**

Albrecht, Bernd, Claudia, Dieter, Erika, Felix arrive at their destination. They use the WEKNOWIT system on their mobiles to receive recommendations for restaurants, plan a sightseeing trip. On their devices they capture images and videos, which they can tag. Key images can be shared with the group. Others are stored on the devices until they can be synchronised with a PC or STB.

### **4.2.2.3 After the trip**

The group have arrived back from the trip. They upload their photos to the WEKNOWIT server via their PCs. The photo and video metadata is also transferred. The photos are automatically organised into a trip blog, based on the trip itinerary, the annotations (manual, automatic) generated during the trip. The users can enter text and additional feedback.

This scenario shows the most parts and functionalities the final WeKnowIt system should offer to the customer. To cover a larger target group and consider also different types of travels we will apply the methodology of personas and scenarios to the specification and particularize with two other use case scenarios.

## 5 User requirements

User Requirements for the Emergency Response and the Consumer Group Study scenario have been devised, dividing them into functional and non-functional requirements.

Functional requirements are defined as outline of the functionalities of a system, in terms of behaviour, inputs and outputs.

Non-functional requirements define qualities of the system, as in how the system is supposed to be, i.e. accessibility, privacy, trust.

For every requirement identified we specify the priority.

Requirements have been removed from public version.

## 6 State of the Art

A brief analysis of the State of the Art for both use case is now presented, to help understanding the technology that already exist in the field.

### 6.1 Emergency Response

Emergency Response is a crucial topic for governments and local authorities worldwide, as it ensure resilience.

In USA a National Incident Management System (NIMS) has been set in place to coordinate emergency planning and management across federal, state, and local agencies.

In UK the Civil Contingencies Act 2004<sup>8</sup> has placed a statutory duty on Local Authorities to “ensure that the organisation can perform its functions so as to reduce, control or mitigate the effects of an emergency”.

Advanced Information Technology Solutions have been adopted in the past years to help effectively manage emergencies.

In the following we will analyse some of the existing solutions, dividing them into broad categories.

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<sup>8</sup> [www.ukresilience.info/preparedness/ccact.aspx](http://www.ukresilience.info/preparedness/ccact.aspx)

### 6.1.1 Pre-Compiled Emergency Guides

Most of the existing work in the emergency response field has been focused on producing structured feeds and repositories such as list of potential mortuary facilities or definition of marshalling zones. All these structured feeds are usually pre-compiled, trying to get an overview of possible relevant information in order for the emergency forces to be prepared. As an example londonprepared<sup>9</sup> is a website that contains publications about various emergency measures and planning.

Other similar websites that contain information about Emergency measures and planning in UK are:

- UK Resilience<sup>10</sup> (see Figure 5) a website that collects Government Guidelines and Risk alerts for UK

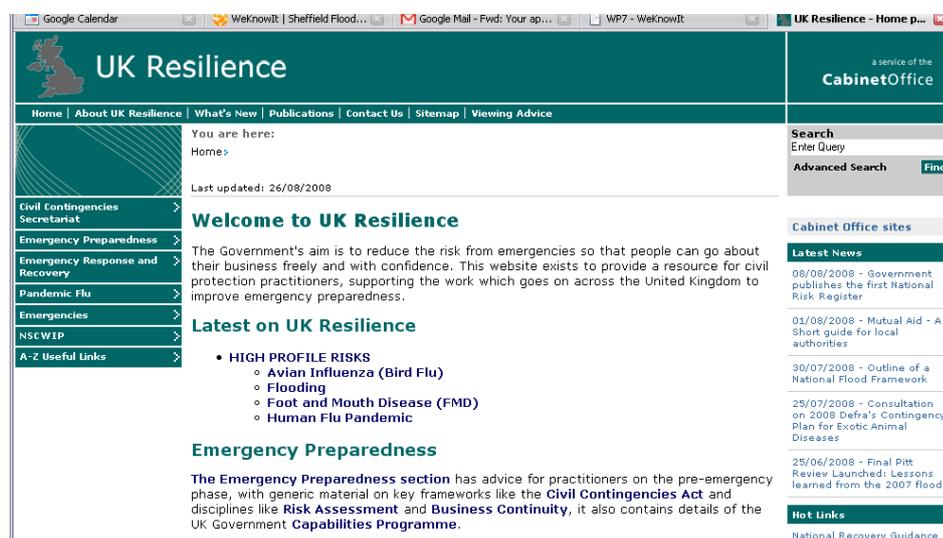


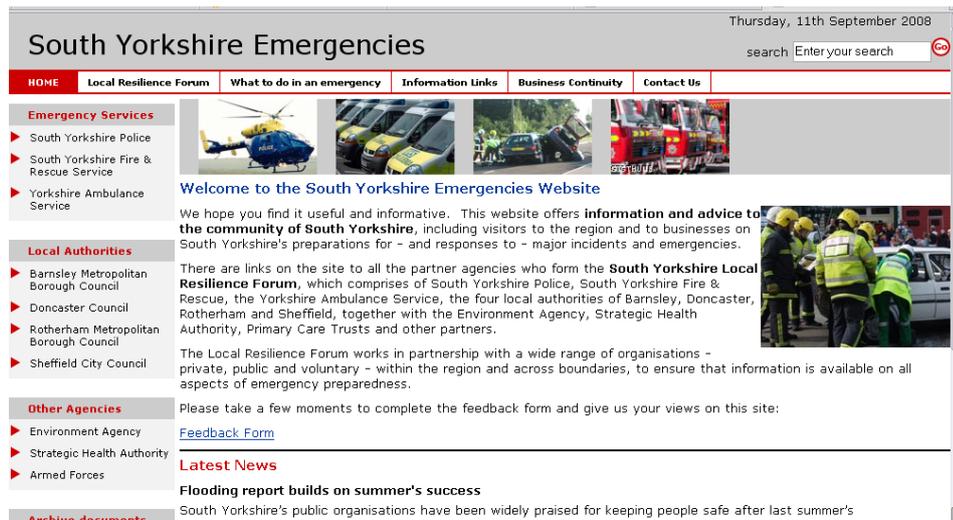
Figure 5 - UK resilience website

- South Yorkshire Emergencies<sup>11</sup> (see Figure 6), a website that collects information and advice about Emergencies to the community of South Yorkshire.

<sup>9</sup> <http://www.londonprepared.gov.uk>

<sup>10</sup> <http://www.ukresilience.gov.uk>

<sup>11</sup> <http://www.southyorkshireemergencies.co.uk/>



**Figure 6 - South Yorkshire Emergency Website**

These resources can be useful if they exactly match the disaster that may happen, but in case of an unplanned emergency, as most of them are, they cannot provide adequate information. Moreover the cost of manually gathering such information and keeping it up to date is very high.

### 6.1.2 GIS-based systems

The South Yorkshire Police and Sheffield University have developed an intranet mapping service that uses GIS to display the geographic location of incidents, analyse patterns and deliver intelligence products<sup>12</sup>.

In Bradford a new GIS system<sup>13</sup> will enable NHS Managers to plot the position of an incident and utilise local resources to manage resources following an incident. NHS Managers will be able to map people's locations and visually see the impact that an incident might have on the surrounding area (particularly useful for the creation of triage centres).

Dorset Explorer<sup>14</sup> is a Web-based GIS for the Dorset area. As part of its development the intention is to provide layers for information on the map

<sup>12</sup> For more details: <http://www.publictechnology.net/modules.php?op=modload&name=News&file=article&sid=14765>

<sup>13</sup> <http://www.emergencyplanning.bradford.nhs.uk/Current+Project/Emergency+Planning+GIS.htm>

<sup>14</sup> <http://195.49.180.76/dorsetexplorer/>

related to Emergency Response and allow ER personnel to upload information to the GIS using a web-based interface, thus providing a unified information source.

### 6.1.3 Automatic location-based systems

When considering building automatic systems for aiding the emergency response sector, it is important to take into account previous work and research conducted in similar or complementary areas, such as automatic systems that use NLP technologies to generate maps extracting content from news feeds [6].

Other systems focus on associating text indexing with spatial indexing methods to categorise web documents with respect to the geographic location [7]: although this is a sophisticated approach is very time consuming and focuses on the disambiguation problem more than on collecting quickly information about a disaster area.

When a disaster occurs, it is usually in a limited geographical area, where the problems of disambiguation are less a concern. Automated methods have been previously investigated to construct structured data, such as UK Ordnance Survey that uses photographs to automatically extract information about buildings [8]. This system relies upon satellite telemetry and on the availability of postcode data. The structured data produced is limited and highly focused, but is not integrated with information available from the web.

The Armadillo e-response research project was part of a larger consortium (AKT) that aimed to develop a set of tools for providing timely and relevant information for improving disaster management [9, 10, 11, 12].

SemGov [13] attempts to bring together existing structured knowledge and geographical visualisations to aid emergency event handling using agent based technology. This work uses agents to visually display geographically bounded structured knowledge from a number of sources<sup>15</sup>. The aim behind this work was to bring together needed information from a variety of sources into a singular map based system<sup>16</sup> to aid the handling of an emergency. Although being a good demonstrator of the concept of combining relevant information into a visual system, SemGov has a strong reliance on remote and distributed technologies leaving it vulnerable to disruption during an emergency. Also the system prototype relied on limited existing structured information only without

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<sup>15</sup> ( 1) Essex County Council Emergency Planning Department knowledge base on locally relevant buildings, schools, supermarkets, hospitals etc, 2) meteorological knowledge 3) a jabber based chat system)

<sup>16</sup> using Google Maps API

any acquisition strategy for new information, a reliance on only existing information is problematic as this is frequently in short supply in emergency situations.

#### 6.1.4 Management Systems

ATLAS Incident Management System<sup>17</sup> (AIMS) is a software system for managing and coordinating resources during an emergency. It allows recording every action (with timestamp) and assigning and checking tasks. The main aim of AIMS is to coordinate the Local Authority emergency operations facilitating their actions. The system output is a complete chronological event / incident log.

Amongst the system features:

- Logging of all incoming/outgoing messages
- Allocation of "tasks" to individuals or departments
- Logging of any actions taken in response to tasks received
- Generation of "Situation Reports"
- Management of multiple incidents
- Access to contacts database
- Pre-defined auto-generated actions
- Access to on-line emergency plans

Purvis Incident Management System<sup>18</sup> is another example of software system for managing emergencies in USA. It provides the ability to determine priorities, assign tasks, manage resources, develop on-site organizational structures and help keeping track of costs.

Emergency Pre-Plan Services (EPS)<sup>19</sup> is another USA company that offers Emergency Management software, GIS-enabled to provide local information about utility layers roads identification, dimension and construction, historical disaster information such as flood levels.

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<sup>17</sup> <http://www.atlasops.com/AIMS%20overview.htm>

<sup>18</sup> [http://www.purvis.com/prod\\_pub\\_incident\\_management.asp](http://www.purvis.com/prod_pub_incident_management.asp)

<sup>19</sup> <http://www.emergencypreplans.com/index.htm>

Vector Command Support System<sup>20</sup> attempts to provide uniform access to information at various levels of organisation. Providing commanders access a range of information sources – database information (such as risks, standard operating procedures, parking and hydrants) streamed video imagery from helicopters, traffic cameras or incident cameras, template or ad hoc organisational asset information, GIS mapping and electronic whiteboard sketch maps (known as ‘mudmaps’) – to create a clear, accurate picture of an incident showing threats, resources and proposed actions. Commanders can then share that information as a common operational picture across an incident ground (on tablet PCs), throughout the incident command structure as well as back to headquarters and to other interested multi agency organisations on scene or at their own headquarters.

Note that the system does not use web-based access to information as the developers believe that the web does not provide the necessary resilience.

### 6.1.5 Web2.0/Social Applications

Social Networks and Web Applications are starting to be used to help managing emergencies and communicating with citizens.

Recently a new location-based emergency system won the Google Android Developer Challenge. Life360<sup>21</sup> uses a multi-channel messaging system and neighbourhood-centric social network to keep the user up-to-date and in contact with family and local community, with customised emergency alerts.

Life360 can access the user medical information and emergency profile so to be able to find needed assistance. The system is all location-based, and facilitates asking for help or to offer help to people in an emergency.

CommunitySafe<sup>22</sup> is a web-based information source for the London community relating to ER issues. CommunitySafe is a central point of real-time advice and information on counter-terrorism and crime reduction provided by the police and local councils.

The US Federal Emergency Management Agency (FEMA) has teamed up with MySpace to distribute a tool for hurricane management<sup>23</sup>. This tool (available in Spanish and English) has information on how to get help, helps users to locate victims using FEMA's National Emergency Family

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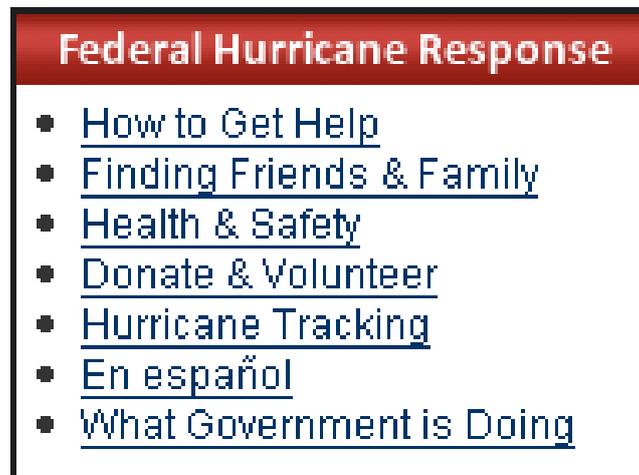
<sup>20</sup> <http://www.emergencycommandsystem.com>

<sup>21</sup> <http://www.life360.com>

<sup>22</sup> <http://www.communitysafe.gov.uk/>

<sup>23</sup> [http://www.dhs.gov/xprepresp/programs/gc\\_1220128923561.shtm](http://www.dhs.gov/xprepresp/programs/gc_1220128923561.shtm)

Registry and Locator System, facilitating donations, volunteer registers and tracks the approach of the hurricane (see Figure 7).



**Figure 7 - MySpace FEMA tool for hurricane response**

Smart Applications For Emergencies<sup>24</sup> (SAFE) is an Australian lead development of new technologies to aid emergency scenarios within Australia. The project investigates four main research areas,

1. Information Management: Looks at the investigation of crisis information management systems (CIMS) as they deal with critical information flows within emergency systems. This work focuses upon notification and resource management. One example of this work is the open source "Cairns" project<sup>25</sup> an application capable of orchestrating communication in an emergency using CAP and EDXL standards.
2. Sensors Understanding: Concerning the use of cameras and pattern recognition software to recognise and follow a face in the crowd and unusual behaviour in an area.
3. Agents: simulation of emergency resources to best model appropriate usage of emergency resources in emergency situations.
4. Networks: the research is aimed at creating wireless networks that are able to heal themselves if a node in a network stops working to maintain data connectivity.

The research outcome of SAFE's information management highlights the need to empower effective communications under emergency situations in WeKnowIt. It also highlights the need to use existing standards where

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<sup>24</sup> SAFE - [http://nicta.com.au/research/projects/smart\\_applications\\_for\\_emergencies](http://nicta.com.au/research/projects/smart_applications_for_emergencies)

<sup>25</sup> Cairns project - <http://sourceforge.net/projects/cairns/>

they maybe used (but as said previously adoption in the European Union is so far not visible). SAFE's information management software Cairns, simply reuses existing communication standards previously explained, it offers little new technology to the state of the art regarding WeKnowIt's aims.

The open source system Sahana<sup>26</sup> is a Web 2.0 platform for connecting organizational emergency response with volunteers. Initially, it was developed by a Sri Lanka government organization to support coordination and knowledge management during the emergency after the earthquake in the Indian Ocean in 2004 that resulted in a Tsunami hitting the coastline of several countries. Sahana has a number of built-in domain specific functionality like lists of missing persons, camps, and volunteers.

Furthermore, it has the ability to manage profiles of users and to establish collaborations among them for certain tasks.

The project 911.gov [14] aims at developing a Web 2.0 platform supporting the collaboration of organizational entities for emergency response and citizens. One goal is to shift communication from phone centres to the web platform. Since this work is in an early stage, no further results are given.

To summarize the different platforms and projects for knowledge management in emergency response, it has been shown so far that Web 2.0 can indeed be reasonably used in the emergency response domain. Especially the openness and easy usability facilitate the involvement of a very broad range of people, from regular citizens to professional and organized emergency response personnel.

### **6.1.6 Wikis as an information mediator in emergency situations**

The work of White et al. [15] investigates the potential of wikis for knowledge management in emergency response. The authors come to the conclusion that available wiki platforms are a suitable means to share knowledge about an emergency case. But they also state that due to the special nature of the emergency domain further research and development is needed. On likely criticism of such approaches is the completely open nature of the technology allowing anyone to adjust content could be very detrimental in particular emergency situations.

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<sup>26</sup> Sahana - <http://www.sahana.lk/>

### 6.1.7 Mobile Localisation techniques

The non-delayed communication of trustful information about the geographical location of an emergency incident is of utmost importance to the public safety agencies, so that assistance can rapidly be delivered to the scene of reported emergency. The requirement that wireless callers to emergency numbers support location-enabled technologies, so that their physical presence can be identified for their safety, is something already legislated in the United States and scheduled for in parts of Europe and Asia. In the US, the Federal Communication Commission (FCC) issued, in 1996, a mandate requesting specific levels of location performance to support their emergency call system (E-911). Likewise, the European equivalent emergency call system (E-112) is initiated by the Coordination Group on Access to Location Information by Emergency Services (CGALIES) and is likely to follow the FCC approach.

These recommendations play a significant role in promoting and establishing technologies on the detection of the location of mobile devices. Many diverse mobile positioning techniques have already been used, each having a distinct performing accuracy. Generally, these are categorised in four main groups, depending on the technology in use:

1. Handset-based: Satellite-enabled, where the device has an integrated receiver of satellite signals (e.g. GPS)
2. Network-based: Enabled by the normal operation of mobiles in the cellular network; these may require adjustments on software or hardware, on mobile devices or network infrastructure (e.g. Cell-ID, E-CID, CID+TA, E-OTD, U-TDOA, A-GPS etc.)
3. WiFi-based: These are based on the WiFi signal strengths that get received by the mobile devices (e.g. commercial products of Navizon, Place Lab, Google Maps Mobile, etc.)
4. Hybrid ones: Techniques based on the hybridisation of the above (e.g. A-GPS + U-TDOA etc.)

Mobile localization technologies, despite their rapid advancements over the last decade, still are at an initial stage of development. Reliability aspects such as stability, accuracy, uninterrupted accessibility and reactivity, as well as the need for specialised electronic maps of high precision are still user requirements which are still to be satisfied.

## 6.2 Standards for emergency response

A number of standards have recently been developed to aid handling of emergencies and disseminating emergency information.

### 6.2.1 Specific Area Message Encoding (SAME)

Specific Area Message Encoding or SAME<sup>27</sup> is a protocol originally created to provide and coordinate weather alerts to citizens in the US via radio, this approach was later adapted by the United States Federal Communications Commission for regular broadcast on radio, television, and cable, although this is still used in the United States and Canada this system is largely being superseded by CAP (see below).

### 6.2.2 CAP Common Alerting Protocol

The Common Alerting Protocol (CAP)<sup>28</sup> is an international OASIS agreed standard for emergency message exchange. It is an XML-based format designed for broadcasting and exchange of emergency warnings and information between underlying alerting technologies. The idea behind CAP is to allow standardised dissemination and sharing of emergency information to enable spotting of trends and larger emerging situations from a series of singular alerts. Although this standard was first proposed in 2001 between 120 international emergency managers it was not approved, after repeated trials, until April 2004.

CAP is used in a number of (mostly United States focused) organisations<sup>29</sup> but has still to gain mass adoption, however the USA's Department of Homeland Security's Federal Emergency Management Agency plans to alter all alerting protocols to the CAP standard during the first quarter of calendar year 2009 as the standard for the Integrated Public Alert and Warnings System (IPAWS<sup>30</sup>) [as for FEMA News Release, July 30, 2008<sup>31</sup>].

The CAP data structure is designed to be backward-compatible with earlier existing alert formats (SAME and EAS, see above), while adding new capabilities including:

- Geographic region coding using latitude/longitude "boxes" in three dimensions (i.e. also including heights above sea level where relevant).

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<sup>27</sup> Full SAME specification document  
<http://www.nws.noaa.gov/directives/010/pd01017012b.pdf>

<sup>28</sup> CAP full specification document [http://www.oasis-open.org/committees/download.php/15135/emergency-CAPv1.1-Corrected\\_DOM.pdf](http://www.oasis-open.org/committees/download.php/15135/emergency-CAPv1.1-Corrected_DOM.pdf) (link valid sept2008)

<sup>29</sup> A full list of organisations using CAP can be obtained at the following URL [http://www.incident.com/cookbook/index.php/Who\\_Is\\_Using\\_CAP%3F](http://www.incident.com/cookbook/index.php/Who_Is_Using_CAP%3F) (link valid sept2008)

<sup>30</sup> IPAWS - <http://www.fema.gov/emergency/ipaws/> (link valid sept 2008)

<sup>31</sup> <http://www.fema.gov/news/newsrelease.fema?id=45424>

- Phased and delayed effective times and expirations, to detail the timing and expected expiry of a warning.
- The ability to update, amend and cancel prior alerts with new alerts. Thus allowing situational updates.
- Digital encryption and signature capability; to allow certification of message sender and encrypt secure messages (this approach is used to convey secure encrypted alerts between US embassies worldwide).
- Facility for embedding digital images, audio and video. Although it is possible to embed media there is no standard to add metadata concerning these “attachments”. Also the encoding of these data attachments is embedded into the XML making it costly to extract.
- Multilingual and multi-audience messaging;

The main usage of CAP is to provide alerting mechanisms on a high bandwidth broadcast network aiming towards dissemination at a high strategic level and not between low level agents. The mechanism of the standard is not designed to be either bandwidth or processor efficient so is not appropriate in many emergency situations.

### 6.2.3 Emergency Data Exchange Language (EDXL)

The emergency data exchange standard means to transport information between relevant parties during and concerning emergency situations. EDXL was first proposed as a standard in 2005 but is still under development. EDXL is made up of a series of related standards such as EDXL-DE<sup>32</sup> for distributing routing to recipients and EDXL-HAVE<sup>33</sup> which standardises a means to disseminate information concerning hospital readiness i.e. bed capacity, availability of units, emergency department status and so on. These standards aim to create an integrated framework for a wide range of emergency data exchange mechanisms to support operations, logistics, planning as well as finance of emergency situations. However despite this range of integrated standards they are again based upon XML based messages which are typically delivered (with even greater bandwidth concerns) embedded within CAP messages. Adoption of

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<sup>32</sup> EDXL-DE distributable element - full specification - [http://docs.oasis-open.org/emergency/edxl-de/v1.0/EDXL-DE\\_Spec\\_v1.0.pdf](http://docs.oasis-open.org/emergency/edxl-de/v1.0/EDXL-DE_Spec_v1.0.pdf)

<sup>33</sup>EDXL-HAVE full specification [http://docs.oasis-open.org/emergency/edxl-have/pr05/emergency\\_edxl\\_have-1.0-spec-pr05.pdf](http://docs.oasis-open.org/emergency/edxl-have/pr05/emergency_edxl_have-1.0-spec-pr05.pdf)

these new standards is still uncertain beyond the United States department for homeland security and has no known usage outside of the United States.

#### **6.2.4 W3C - Emergency Information Interoperability Framework (EIIIF)**

In Early 2008 the internet standards body W3C formed the Emergency Information Interoperability Framework Incubator Group<sup>34</sup>, to propose a worldwide interoperability framework for emergency information. As this group and its resulting standards are still in their infancy it is expected to be potentially relevant during the life of the WeKnowIt project.

#### **6.2.5 Cyclone Warning Markup Language (CWML)**

This highly specialised language is a structured means to share information concerning Cyclone events in draft production by the Australian ICT centre of Excellence<sup>35</sup>. This mark-up language allows the encoding of specialised information relating to cyclones allowing warning dissemination and study of cyclone events. This standard although of interest is considered too specialised for further study within WeKnowIt.

#### **6.2.6 Tsunami Warning Markup Language (TWML)**

Like the CWML the Tsunami warning mark-up language provides a standard means to disseminate and discuss the nature of Tsunamis. This although of interest is very specialised so is not considered further regarding standardisation approaches.

### **6.3 Consumer Group Study**

Then application proposed in [16], called 'reality', addresses in particular the challenge of modelling customers' personal preferences and providing solutions that are tailored to just those preferences. In contrast to existing technologies which allow the optimization of only a small and predefined set of preferences, this tool allows a wide variety that can accurately model the preferences of different customers. The use case presented in

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<sup>34</sup> W3C EIIIF Incubator Group - <http://www.w3.org/2005/Incubator/eiif/>

<sup>35</sup> CWML standard specification - [http://nicta.com.au/\\_data/assets/pdf\\_file/0005/8645/CWML-10.pdf](http://nicta.com.au/_data/assets/pdf_file/0005/8645/CWML-10.pdf)

this paper is the planning of the best itinerary between two cities based on several user preferences.

The idea underlying 'reality' is to replace the travel agent while keeping the same interaction model, i.e., keeping a kind of dialog between the customer and the system. Most of existing online booking engines use a sequential model: the user enters the search criteria, clicks on a search button and waits until the results are displayed in a list format. The disadvantages of such a model, making the planning process a very tedious process, are the following:

- The user may not be able to state all her/his criteria at the beginning of the search process. It is likely that some will be discovered as she/he browses the results. In such a case, the user has to restart the search process from the beginning.
- If the user gives many different criteria, it is likely that the system will return no solution. We are in the case of an over constrained problem. She/he has then to restart the search with a subset of criteria until the system returns some solutions.

The proposed approach is significantly different: instead of this sequential model, a conversational one is used, i.e., a mixed initiative system [17] similar to the one described in [18]. This means that a kind of dialog is established between the user and the system. Actually, the user reacts positively or negatively to the suggestions made by the system until she/he finds something fitting her/his needs. As indicated in [19], if there is nothing to critique, the user has already found what she/he was looking for. The system always makes suggestions even if no one satisfies completely the user's criteria. This is called partial (or soft constraint) satisfaction. Of course, this interaction model is user-friendly only if the response time is very short. The constraint-based technology used behind our user interface fits well this requirement.

In [20], an approach for integrating context-aware computing to a mobile travel assistant is described. Current mobile devices (such as PDAs) enable advanced software development for such purpose. However, some challenges must be faced in order to truly offer a real support for the traveller. These challenges are related to context-awareness and usability issues. The proposed approach to overcome such difficulties is based on data structures, called User Task Models, providing an explicit record of user activities and intentions that serves as a basis for: a) filling in context in user-initiated actions, and b) activating relevant proactive services. Thus, User Task Models include travel plan information while providing context-awareness in a succinct way. Travel plans, generated using 'reality' application [16], are enriched within compact and powerful

structures, called User Task Models. These structures are transferred to a mobile device enabling the support for the traveller during his trip.

In [21] the development and evaluation of an intelligent electronic tourist guide is presented. This system is called GUIDE and it has been built to overcome many of the limitations of the traditional information and navigation tools available to city visitors. The paper authors gathered an initial set of requirements for GUIDE from a series of semi-structured, one-to-one interviews. The tourist guide should provide sufficient flexibility to enable visitors to explore and learn about, a city in their own way. Also the information presented to the visitors should be tailored to their context. For example, the presented context should be related to the visitor's interests, e.g. history or architecture. The information should be presented in a way that is suitable given the age and technical background of the visitor and their preferred reading language. The system also supports Dynamic Information that changes over time. Finally, the system is required to support Interactive services (e.g. some form of electronic messaging service connected with Tourist information centres).

One other important feature is the ability of providing geographic information. The authors also propose another characteristic that is the automatic creation of a tour of the city. It should be based on several factors such as, the opening and closing times of the requested attractions, the best time to visit an attraction, e.g. avoiding opening time if there is often a queue and the distance between attractions and the most aesthetic route between them.

Finally, the proposed system evaluation is presented by measuring the quality of the experience of experts as well as end-users.

Another important issue is the information presentation in textual and graphical form in the PCs as well as in mobile devices. In [22] and [23] an Interactive Visualisation of a Travel Itinerary is presented. It can be seen that there were efforts for information visualization when the mobile phones were supporting only WAP technologies and the devices visualization capabilities were very limited.

In [24] results from studies of backpacker culture and gaps identification where future technologies could assist backpackers in existing situations are presented. The research includes contextual interviews with backpackers, tours of hostel accommodation, and reviews of online discussion and blogging sites. The results indicate the need for mobile devices which can help a social, distributed community to connect and

coordinate. To address this, the paper authors developed methods of depicting community interaction and context of use, and prototype mobile travel assistants.

A unified user interface in which a single form can be used for planning all aspects of a trip is presented in [25]. This interface design clearly marks the (human or system) origin of the fields' content, and lets them fix information snippets so that they can make steady progress on the form and are assured the system will not override content that they provided.

## 7 Conclusions

This deliverable has presented the work done for analysing the two use cases of WeKnowIt:

- Emergency Response, where users can provide intelligence about large scale emergencies both empowering a more effective and informed emergency action, and receiving information on how to act.
- Consumer Group Study, providing enhanced publishing tools to support group activities and the ability to extract meta-information from content sources and groups discussions to leverage Collective Intelligence for private, commercial and public purposes.

In order to analyse the use cases, user studies have been undertaken using similar methodologies and techniques.

The chosen methodology was user-centred, based on user questionnaires and interviews and on an analysis of the State of the Art, including both Academic and Commercial solutions.

After conducting the user studies and the State of the Art analysis, it became clear that current systems and methodologies do not exploit all the existing levels of intelligence.

Currently emergency response applications are mainly based on personal and organisational intelligence and slowly expanding towards social intelligence. Usually these applications are targeted or to the Emergency Response personnel or to the citizens; the challenge of WeKnowIt is to provide a unified system that targets both citizens and emergency response personnel, providing different functionalities accordingly to the user role and exploiting all the intelligence to collect and find the needed knowledge at the right time in the right format.

In the Consumer Group scenario, the status quo is mainly based upon personal intelligence. Social intelligence is used to analyse the user profiles and the users' travel behaviour; Mass intelligence is also developed, but still at a quite low level.

The main problem of most of the existing travel information and review pages is that information are just tagged and connected to each other manually.

In travelling business, collective intelligence can economically help to perfectly match the customer needs (of either individuals or groups) by analysing existing data with aid of semantic algorithms and to optimize the portfolio of travel agencies. Therewith, a higher degree of customer satisfaction by providing better information can be achieved, which is

likely to result in higher revenues due to higher commissions of travel providers.

Two scenarios were then derived, that clearly indicate the contribution that WeKnowIt is expected to provide and how this is realised through the research activity of the different work packages.

In general, WeKnowIt aims to design, implement and deliver technologies and methodologies that exploit collective intelligence to deliver the right information at the right time to the right person in the right format.

In particular, in the Emergency Response scenario citizens distributed across the region will be able to participate in the monitoring of an incident or event. This will benefit Emergency Response planners that will have real time information available on which they can base their decisions and strategies, enabling them to better react to an Emergency. Moreover, the system will automatically gather information available elsewhere on the network to aid the Emergency Response, thus making possible for an emergency planner to find exactly the needed knowledge amongst all the available information and to selectively make this knowledge available to the citizens (e.g. information about open roads, information about relatives involved, etc.) in a largely automated way. The technologies in use will therefore also encourage and enable dialogue between the Emergency Responders and individuals, groups and communities

For the Consumer Social Group case study WeKnowIt will provide the ability to extract meta-information from various content sources and user generated content within the system and will furthermore provide enhanced publishing tools to support travel activities for single persons and groups. WeKnowIt will automatically analyze the uploaded content, user's profiles and their actions in order to improve knowledge about the community. Based on the travel behaviour of all users and an analysis of their profiles, WeKnowIt will extract information about the most preferred travel destinations and the trends and changes in user behaviour. This information will be used to make recommendations to the users and support the decision making process before (e.g. destination) and during the trip (e.g. restaurant).

A scenario has been designed and evaluated with real users for each use case, and requirements have been gathered during the process.

The choice of the two use cases proved to be very insightful as from the user studies many similarities have emerged that dealt to the definition of similar user and system requirements.

Following work will see the definition of common requirements and implementation strategies.

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## Appendix

### A. Sheffield Questionnaire

### Floods

### Anniversary

#### Personal Details

Age

- < 25
- 25-34
- 35-44
- 45-60
- >60

Age

How often do you use Internet (mail, website surfing etc.)?

- never
- rarely
- sometimes
- often
- all the time

Internet usage

Do you use social networks (e.g. facebook, myspace)?

- never
- rarely
- sometimes
- often
- all the time

Social network usage

Do you contribute to public forums or blogs (e.g. sheffieldforum or bbc news)?

- never
- rarely
- sometimes
- often
- all the time

Do you contribute to public forums or blogs?

Do you share content online (e.g. upload pictures to flickr)?

- never
- rarely
- sometimes
- often
- all the time

Content sharing

### Your experience

Were you directly involved in the Sheffield floods?

- yes
- no

How did you get to know about the emergency in the first place?



During the floods, you were

- at home
- at work
- travelling
- other

In which district of Sheffield were you located?

How were you affected by the floods?

Who did you first contact during the floods

- family
  - friend
  - emergency service
  - other
- first contact

Did you contact any of the following emergency services?

- 999
  - 101
  - Fire services
  - Ambulance
  - Police
  - Local authority
  - other
- emergency service contacted

How did you contact the chosen emergency service?

- phone
- email
- text message
- other  
contact modality

Did you get connected with the service you wanted?

- yes
- no

Did you get connected with the service you wanted?

Did you use any of the following to communicate with your family or friends during the floods?

- phone call
- text message
- email
- MMS
- instant messaging (e.g. MSN)
- twitter
- public forum (e.g. sheffieldforum)
- social network (e.g. facebook)
- other

Did you use any of the following to communicate with anyone else during the floods?

- phone call
- text message

- email
- MMS
- instant messaging (e.g. MSN)
- twitter
- public forum (e.g. sheffieldforum)
- social network (e.g. facebook)
- radio
- other

Did you use any of the following to communicate with everyone else during the floods?

If you used a mobile phone, did it have?

- Camera
- Bluetooth
- WI-FI
- Video recorder
- Voice recorder
- GPS

mobile phone features

Did you take pictures using

- camera
- mobile phone

pictures device

### **Content Sharing**

Did you try to send/upload any photos to any of the following?

- Public forum (e.g. sheffieldforum)
- Social network (e.g. facebook)
- News website (e.g. bbc news)

- Instant messaging (e.g. msn)
  - Photos website (e.g. flickr)
  - emergency services (e.g. email to the police)
  - other
- photos sent or uploaded

Did you try to send/upload at any video to any of the following?

- Public forum (e.g. sheffieldforum)
  - Social network (e.g. facebook)
  - News website (e.g. bbc news)
  - Instant messaging (e.g. msn)
  - Videos website (e.g. youtube)
  - emergency services (e.g. email to the police)
  - other
- video sent or uploaded

How many photos did you send/upload?

- <20
  - 20-50
  - >50
- average number of photos sent

How many videos did you send/upload?

- <5
  - 5-10
  - >10
- average number of uploaded videos

Did you follow the floods using any of the following?

- Public forum (e.g. sheffieldforum)
  - Social network (e.g. facebook)
  - News website (e.g. bbc news)
  - Instant messaging (e.g. msn)
  - Photos or Videos website (e.g. flickr or youtube)
  - other
- Did you follow the floods using any of the following?

Did you receive any of the following?

- Photos
  - Videos
  - Text
  - Audio
- most used content

With whom did you try to communicate most?

- family
- friends
- others

Who did you try to share the content most with?

### Contact details

If you are interested in participating further in this study (e.g. being interviewed) please leave your email address

## B. Service Provider Interviews – Questionnaire

### User generated content

1. What value does adding user generated content bring to the travel site?
2. How many users currently contribute content, compared to those who book/retrieve information on the site?
3. What is the popularity of user generated content compared to professionally generated content (e.g. travel guides)?
4. Are there mechanisms to search the user-generated content?
5. In what ways do you think it would be useful for users to search the user-generated content?
6. How do you currently screen and remove unsuitable content?
7. Are there particular data protection laws that are followed in managing user data and content generated by users?

### Usage patterns

1. What proportion of users return to the site for repeated travel bookings?
2. Does the usage of the site provide any insights into the user workflow for planning and booking travel (i.e. are there particular patterns of usage of specific pages)?

### Data analysis

1. What types of analysis is done on data collected from the site?
  - a. Hotel ratings.
  - b. Photos taken (locations visited etc.)
  - c. Trip reports.
  - d. Question answering.
2. How do you think automated analysis could be used to generate improved services to users?
3. How could the results of data analysis be used to generate additional revenues (e.g. hotels, tourist information services etc.)?
4. Would you consider having a professional user portal that could be available to travel partners to provide information on statistics and trends?

### Navigation and cross-selling

1. Currently the site is divided into distinct areas. Did you also consider a system where users can view a destination and book an itinerary without having to navigate to a different area?
2. What are the current methods for cross-selling?

3. What do you think are potential opportunities for cross-selling products and services (give examples)?
  - a. Cross-selling of travel products.
  - b. Cross-selling of related product.
4. What are current (types of) partners for cross-selling?
5. What are possible (types of) partners for cross-selling?
6. What are opportunities for for cross-selling services and products consisting of a combination of services or products provided by more than one partner (give examples)?

### **Personalisation and recommendation**

1. What user authentication features are currently provided? What information is requested from users in order to create an account?
2. From the total number of visitors, what proportion of these create an account?
3. Is logging of user transactions is carried out? If so, is this information currently used in any way?
4. Is there currently any form of recommendation made to users?
5. How do you think recommendation systems could be used to provide information and services more targeted to individual users?

### **Mobile access**

1. What features on the site should be provided to mobile users?
2. Are there additional features that could be provided to mobile users that are not currently available?
3. How would the site generate revenue from mobile users?

## C. Consumer Group Interview Guidelines

### Part 0: Introduction

„Thanks for taking your time to take part in this interview. In the course of the EU-founded project Weknowit we are dealing with the issue to optimally support people when planning and conduction vacations. In a first step, we want to collect information on the general behaviour when seraching for information and planning vacations. This can help us to perfectly support these approaches in future.

Your statements will be analyzed and used anonymously. We do not want to validate your approach and your behaviour, we want to get to know about how knowledge is collected and forwarded. Please complete our questions whenever it makes sense in your opinion. If something is not clear to you or a question is mistakable, do not hesitate to ask.

Do you have any questions in advance?

If everything is clarified, I would like to start with the interview.”

## Part 1: Guideline for the conduction of interviews

### Part 1.a: General questions, semi-structured knowledge

Identification of the person		
General Question	I1	Which kind of holiday do you like best? <ul style="list-style-type: none"> <li>○ City trips</li> <li>○ Beach holiday</li> <li>○ Package tours</li> <li>○ Adventure tours</li> <li>○ Group vacations</li> <li>○ Sport vacations</li> <li>○ Family holiday</li> <li>○ _____</li> </ul>
General Question	I2	Why do you prefer this kind of holiday?
General Question	I3	How many times do you travel annually?
General Question	I3.1	What were your last three travel destinations, which kind of holiday did you spend there and how long was your stay? 1. _____ 2. _____ 3. _____
General Question	I3.2	Do you travel within Germany? Are national destinations of general interest to you, if so which destinations?
General Question	I4	Do you prefer travelling on your own or together with others? <i>If alone go on with I5</i>
General Question	I4.1	With whom do you travel? <ul style="list-style-type: none"> <li>○ Life partner</li> <li>○ Family</li> <li>○ Group</li> <li>○ Friends</li> <li>○ _____</li> </ul>

General Question	15	<p>What do you expect of a good vacation?</p> <ul style="list-style-type: none"> <li>○ Recreation / Sun</li> <li>○ Get to know new cultures / Education</li> <li>○ Sports / Action</li> <li>○ Get to know new people</li> <li>○ Party</li> <li>○ _____</li> </ul>
General Question	16	<p>What should definitely not happen during your holiday?</p>

Information Procurement		
General Question	B1	<p>Which information are most important to you when planning your vacations?</p> <ul style="list-style-type: none"> <li>○ Prices</li> <li>○ Weather</li> <li>○ Information on the destination (Culture, Sights, ...)</li> <li>○ Potential Activities / Sports offers</li> <li>○ Infrastructure</li> <li>○ Hotel data</li> <li>○ Flight data</li> <li>○ _____</li> </ul>
General Question, Mass Intelligence, Social Intelligence	B2	<p>Where do you get your information from?</p> <ul style="list-style-type: none"> <li>○ Family and Friends</li> <li>○ Colleagues</li> <li>○ Travel agency</li> <li>○ Travel Catalogue</li> <li>○ Travel guides, Atlases</li> <li>○ Magazines, Newspapers</li> <li>○ TV / Radio</li> <li>○ Internet – universal Search, special portals</li> </ul> <p>Which _____ pages:</p> <p>○ _____</p>
General Question	B2.1	<p>Which information do you get from which source?</p>
Gen., Media	B2.2	<p>In which fields are you able to find enough information, which additional information would you like to get?</p>
General Question	B3	<p>Which sources of information do you know, but not use?</p>
General Question	B3.1	<p>Why don't you use them?</p>

General, Media		B3.2	What has to be changed so that you use these sources of information?
Mass Intelligence, Social Intelligence, Organisational	B4		<p>By means of which criteria do you decide on a specific type of holiday or a specific destination?</p> <ul style="list-style-type: none"> <li>○ Recommendation of family and friends</li> <li>○ User ratings on the internet</li> <li>○ Price</li> <li>○ Cultural Offer</li> <li>○ Sports offers</li> <li>○ Family friendliness</li> <li>○ _____</li> </ul>
General, Organisatio	B5		<p>Where do you book your travel?</p> <ul style="list-style-type: none"> <li>○ Travel agency</li> <li>○ Internet, which platform?</li> <li>○ _____</li> </ul>
General, Personal	B6		In how far do you plan your activities when travelling in advance and in how far do you inform yourself on site?
Personal Intelligence		B6.1	<p>Which information do you need on site?</p> <ul style="list-style-type: none"> <li>○ Events</li> <li>○ Opening hours</li> <li>○ Weather</li> <li>○ Traffic information</li> <li>○ Directions</li> <li>○ Interpreter</li> <li>○ Sights</li> <li>○ _____</li> </ul>
Personal Intelligence,		B6.2	<p>Where do you get these information from? Would you like further information? If so, concerning which topics?</p> <ul style="list-style-type: none"> <li>○ Trends</li> <li>○ Events</li> <li>○ _____</li> </ul>



Personal Intelligence	A3	Have you ever written and/or published your own articles or comments concerning travelling? <i>If „no“ go on with A3.4</i>
Personal Intelligence	A3.1	Where did you publish your articles? <ul style="list-style-type: none"> <li>○ Internet (Forum or the like)</li> <li>○ School magazine/Uni magazine</li> <li>○ Specialist journal/report</li> <li>○ _____</li> </ul>
Personal Intelligence, Mass	A3.2	What is your the motivation to publish information? <ul style="list-style-type: none"> <li>○ It is fun to help others</li> <li>○ I am learning from the reactions and ratings myself</li> <li>○ I am happy when my competencies are accepted</li> <li>○ I want to return the favour of hints from others</li> <li>○ _____</li> </ul>
Media Intelligence	A3.3	Did you have any difficulties publishing your article? Did you wish for further possibilities? <i>Go on to A4</i> <ul style="list-style-type: none"> <li>○ Technical Problems</li> <li>○ Difficulties in understanding the functionalities</li> <li>○ Long-winded processes</li> <li>○ _____</li> </ul>
Personal Intelligence,	A3.4	Why did you not publish anything up to now? <ul style="list-style-type: none"> <li>○ Expenditure of time is too high</li> <li>○ Not interested</li> <li>○ Technical problems in general, problems with tagging</li> <li>○ _____</li> </ul>
Personal, Media	A4	Do you take a lot of photos or tape videos during your holidays? Digital or analogue? <ul style="list-style-type: none"> <li>○ Photos</li> <li>○ Videos</li> <li>○ _____</li> </ul>
Personal , Media	A4.1	Do you edit your photos/videos digitally? Which computer programmes do you use?

Personal Intelligence	A5	<p>To whom do you report on your vacations?</p> <ul style="list-style-type: none"> <li>○ Family</li> <li>○ Friends</li> <li>○ Public through articles, blogs, slide shows...             <ul style="list-style-type: none"> <li>→ If on the internet: Which platform? Why did you choose this platform?</li> </ul> </li> <li>○ _____</li> </ul>
Personal Intelligence, Social Intelligence	A5.1	<p>In which way do you communicate with others to report on your vacations?</p> <ul style="list-style-type: none"> <li>○ Photos</li> <li>○ Videos</li> <li>○ Blogs or Websites; if so, which?</li> <li>○ Telephone</li> <li>○ E-Mails</li> <li>○ _____</li> </ul>

**Part 1.b: Demographical Questions and User Behaviour**

Interviewpartner No: \_\_\_\_

- male
- female

1. How old are you?

\_\_\_\_\_

2. Which part of your annual leave of work do you spent on travelling?

\_\_\_\_\_

3. How often do you use the internet?

	Usage per month				
	never	1-2	3-10	almost daily	daily
intensively					
professional	<input type="radio"/>				
private	<input type="radio"/>				

4. Since when do you have access to the internet?

- Less than 1 year
- 1-2 years
- 2-5 years
- 5-10 years
- >10 years

5. How familiar are you with using the internet?

Beginner					Expert
	<input type="radio"/>				

6. What for do you mainly use the internet?

a. Communication:

	never	scarcely	casually	often	very often
Email	<input type="radio"/>				
Instant Messenger	<input type="radio"/>				
Forums	<input type="radio"/>				
Chat	<input type="radio"/>				
_____	<input type="radio"/>				

b. Information Research

	never	scarcely	casually	often
very often				
Search engines	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Online-Lexicons	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Newssites	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Forums	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Online-Shops	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
_____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

c. Further Activities:

	never	scarcely	casually	often
very often				
Films	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Musics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lotteries	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Online-Banking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
_____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
_____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## D. Social Networking and Media Sharing for Travel Planning

### Desired User Sample

At least 3-4 people who use at least one social network tool and share content with a community, and preferably have used their social network in relation to some travel planning activity

### Questions

#### Social Networking Tools

1. Which social networking tools do you use?
2. How often do you use the tools?
3. What activities do you do? E.g. chat, post content
4. When do you use the tools
5. Who do you contact? E.g. close friends

#### Sharing Media

1. Do you share content socially via digital tools e.g. photos, documents, small video clips?
2. Which tools?
3. Do you use your social networking tools to share content?/ which do you use?
4. How often do you share content?
5. What type of content e.g. just a photo, set of photos ?
6. Who do you share content with?
7. What devices do you use most frequently to create content?
8. What devices do you use most frequently to share content?
9. What is the reason for the choice of device?

#### Planning a trip and user generated content

1. Do you find other people's generated content useful (personal rather than commercial)?

2. Do you like to use user generated content from the web when planning your trip?
3. Have you ever used other people's content when planning a holiday?
4. How has it inspired you or helped you?
5. Have you ever asked questions to a social forum about a place you plan to travel to?
6. Have you ever provided answers to questions in a social forum about a place you plan to travel to?
7. How much do you trust the content from other people?
8. What are the deciding factors you would use when deciding to use this information to make a decision? E.g. hotel recommendations

#### User generated and service generated content

1. what content do you use most frequently?
2. How do you think the content could be improved?
3. Do you use any recommendation services e.g. like Amazon?
4. what do you like to about such services/dislike about such services?
5. Do you use a service manually e.g. weather/climate in certain countries, exchange rates,
6. How do you feel about using any automatic facts being generated for you? E.g. listing the top 5 trendy bars, films in the area
7. What kind of facts automatically collected and sent to you or made available would you like to have as a service?
8. what recommendation topics you find more useful and necessary for your activities?
9. would you mind if your content is used in order to generate such facts, trends and recommendations?
10. Would you like to have content to be automatically analysed so that specific objects could be identified?
11. What kind of events or objects would you like to be automatically identified?

12. Are you interested in receiving recommendations generated by analyzing the behavior of user communities and users in general?
13. Which community, group would you trust more for generating trends, content information (e.g. close friends, groups-communities, the whole Web or relevant site)?

#### Sharing content when on the move

1. When you are traveling do you share content with people back home or people you know?
2. How much/how often?
3. What type of device do you use? Why?
4. When you are traveling do you share content with people you are on holiday with and/or people you meet?
5. Do you like to receive travel updates from friends who are traveling?
6. Would you like other people to use your content and information?

#### Things you would like to be able to do when social networking, sharing content and travelling

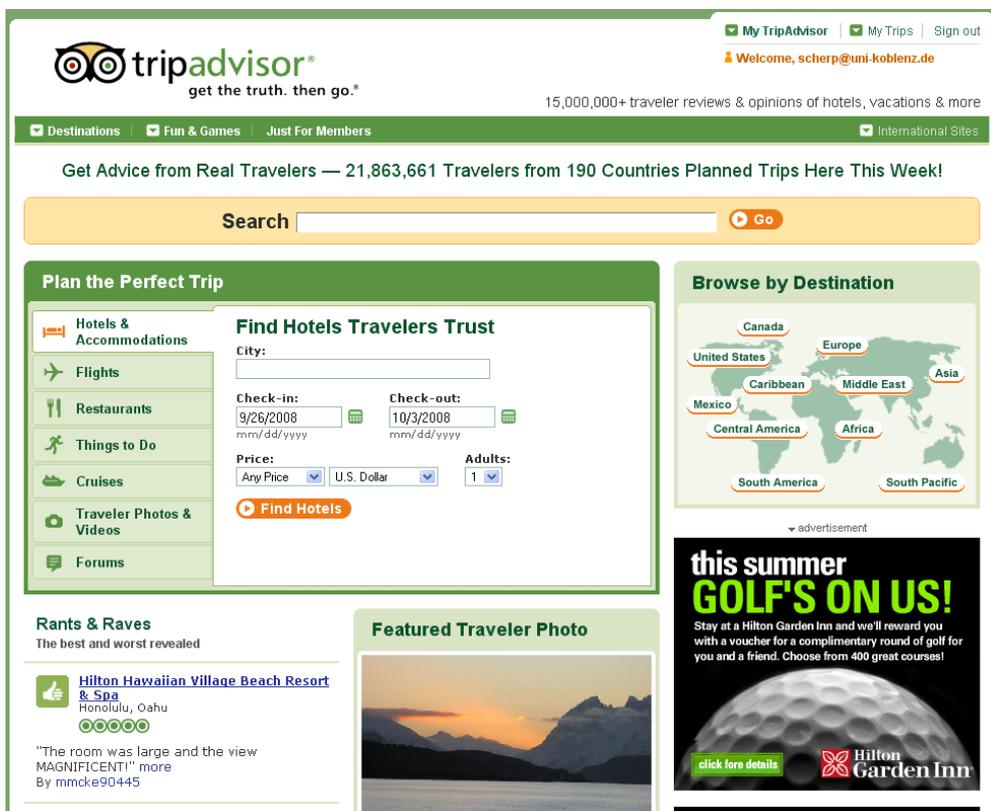
1. What aspects do you find difficult/easy in content sharing?
2. What aspects, if any do you find difficult/easy in social networking?
3. What kind of things would you like to be able to do with the tools you use that you can't at the moment?

## E. Useful features and business models

As already mentioned in the discussion before, there is no website consolidating all features and functions needed for the first WKI use case yet. For that reason, some “good practice” examples of good features and interesting business models of existing homepages are introduced shortly.

**Screenshot:** [www.tripadvisor.com](http://www.tripadvisor.com)

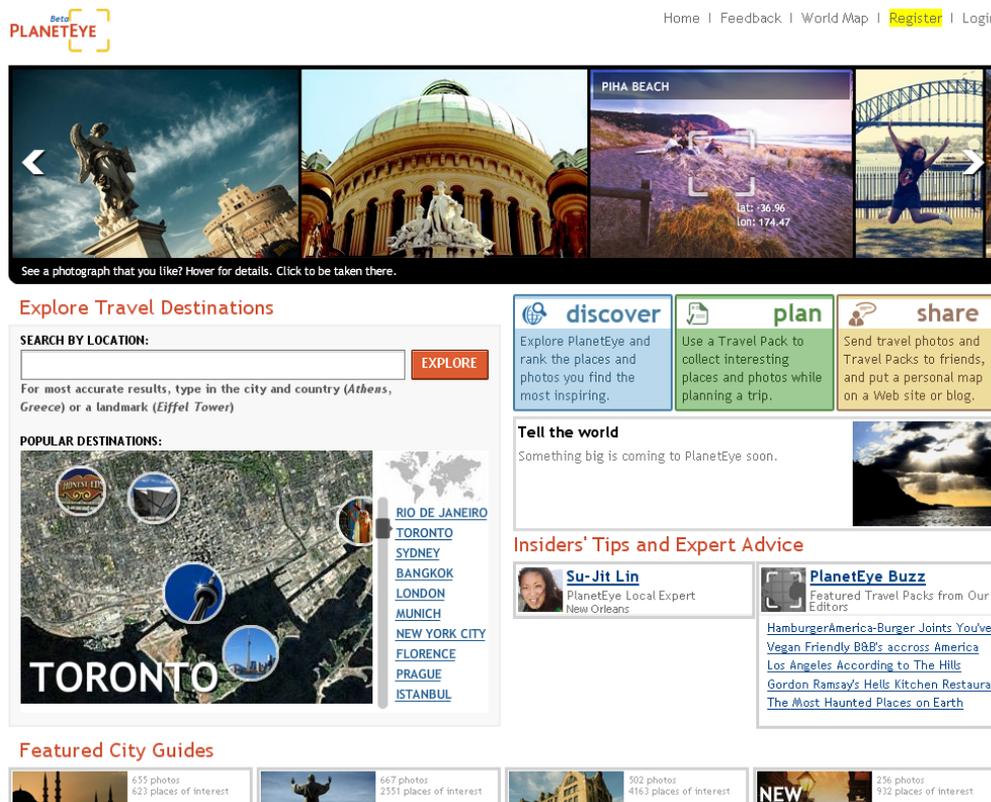
Tripadvisor.com is a traditional recommender website for traveling related questions. It allows one to search for hotels, flights, things to do, photos, and others. Tripadvisor bases on reviews provided by other user. It also has discussion forums about the different destinations. The trip planning tools at Tripadvisor.com allow to create and plan one owns trip. A trip plan is a collection of different material from the Tripadvisor website such as hotels, attractions, and restaurants. In addition, also custom information can be added like information about flights, dining, shopping, and others. However, unlike in WeKnowIt, the trip planned can only be printed or mailed via email. Thus, there is a media disruption when finishing the trip planning and actually going on the trip. WeKnowIt aims at extending this by providing support for the entire trip cycle from trip planning, during the trip, and post trip phase.



The screenshot shows the TripAdvisor homepage. At the top, there's a navigation bar with 'My TripAdvisor', 'My Trips', and 'Sign out'. Below that, a search bar is prominently displayed. The main content area is divided into several sections: 'Plan the Perfect Trip' with a sidebar for filtering (Hotels & Accommodations, Flights, Restaurants, Things to Do, Cruises, Traveler Photos & Videos, Forums) and a central search form for hotels with fields for City, Check-in, Check-out, Price, and Adults; 'Browse by Destination' featuring a world map with regional labels; 'Rants & Raves' with a featured review for Hilton Hawaiian Village Beach Resort & Spa; and 'Featured Traveler Photo' showing a sunset over a lake. An advertisement for Hilton Garden Inn is also visible.

**Screenshot:** [www.planeteye.com](http://www.planeteye.com)

Planeteye.com is an online community for discovering places, planning trips, and sharing media content. When planning a trip, the web site allows for searching restaurants, hotels, sights, and other interesting attractions nearby. The user can also browse through photographs provided by the community. The information gathered can be stored into a so called travel pack. Travel packs can be private or shared with the internet community. It can be viewed as a list or on a map. Finally, Travel packs can be sent to others via email. For photo sharing, only community photos are available (no content from flickr or other providers). However, abstracts from Wikipedia<sup>36</sup> or the New York Times<sup>37</sup> are integrated (mashed up). Further content comes from WCities Destination Guides<sup>38</sup> and Concierge<sup>39</sup>. Thus, Planeteye can be considered a true Web 2.0 application with content mashed up from other sides. It provides support for trip planning and sharing of information. However, unlike Tripadvisor.com it does not support the full trip cycle as envisioned with WeKnowIt.



Screenshot: [www.goabroad.net](http://www.goabroad.net)

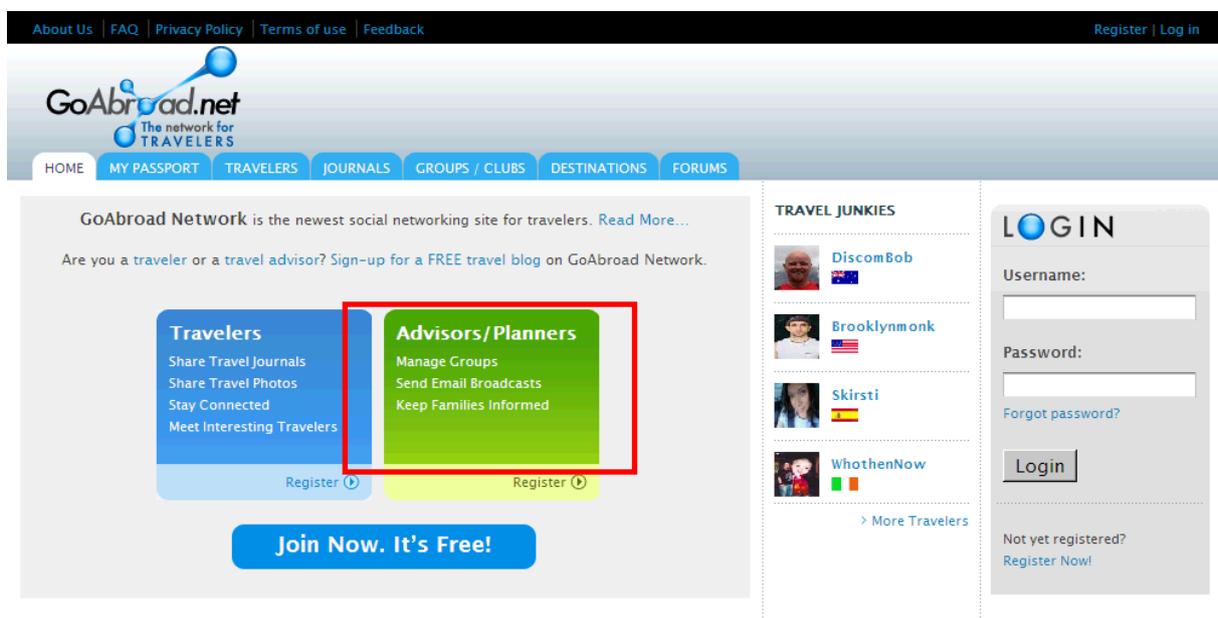
<sup>36</sup> <http://wikipedia.org/>

<sup>37</sup> [http://travel.nytimes.com /](http://travel.nytimes.com/)

<sup>38</sup> <http://www.wcities.com/>

<sup>39</sup> <http://www.concierge.com/>

The Homepage [www.goabroad.net](http://www.goabroad.net) belongs to the websites of type four and therewith already makes use of personal intelligence, mass intelligence and social intelligence. Furthermore, this page provides an interesting business model to generate further revenues. The Login for advisors/planners stressed in the screenshot below offers a feature to manage groups (which does not mean travel plans of groups), send email broadcasts and keep families informed. This feature aims at commercial partners who offer their travel-related services via [www.goabroad.net](http://www.goabroad.net), e.g. language courses or studies abroad. Even a feature for comparing different kinds of programs with respect to your specific interests is offered. For every new client, the commercial partner has to pay an agency fee to [www.goabroad.net](http://www.goabroad.net).



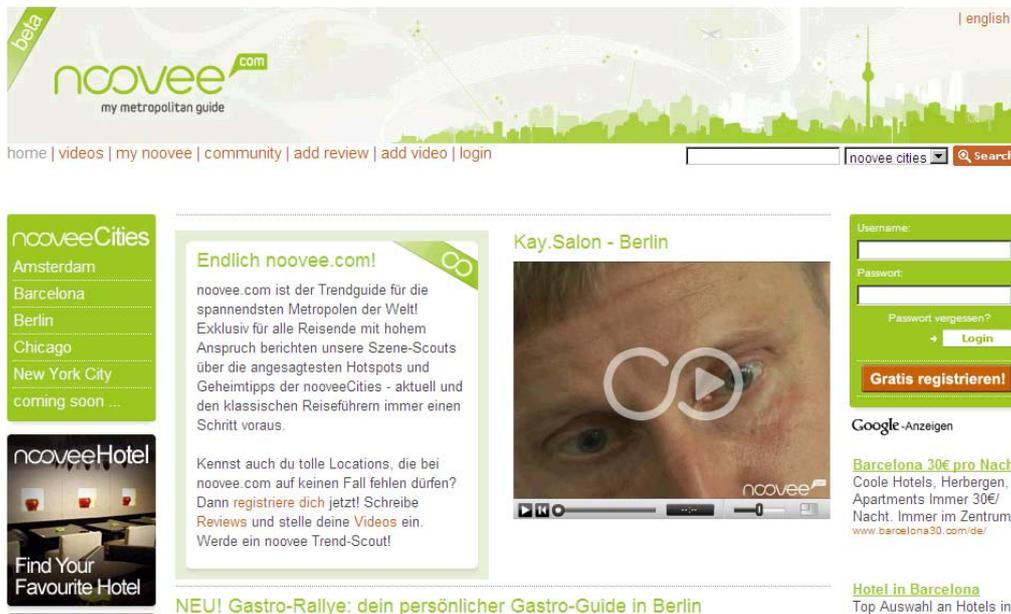
### Screenshot: Usage of maps on [www.mymapblog.com](http://www.mymapblog.com)

By the usage of interactive maps, it will be easier for individuals as well as for groups to plan vacations. New spots can be appended easily by simply clicking on the spot to be marked and adding a comment (which can be seen here at the right border of the screenshot). If now another member of the group clicks on the single spots marked, he can read the information connected to it (e.g. "I have found some nice beaches here, shall we include this spot in our planning"). Hand in hand with a validation system, this will be an easy and intuitive way to plan a group vacation.



### Screenshot: Trendguide on [www.noovee.com](http://www.noovee.com)

Noovee is one of the first platforms already dealing with the issues of trend detection. But in contrast to the aims focused on in WKI, their trend detection is mainly based on the number of good reviews and hints given by members of the community, supplemented by a few trend guides which operate on site. However, this system is quite weak and easy to manipulate as e.g. bartenders who want their bar to be seen as the new hotspot just need to write an appropriate amount of good reviews.



beta

noovee.com  
my metropolitan guide

home | videos | my noovee | community | add review | add video | login

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Find Your Favourite Hotel

Endlich noovee.com!

noovee.com ist der Trendguide für die spannendsten Metropolen der Welt! Exklusiv für alle Reisende mit hohem Anspruch berichten unsere Szene-Scouts über die angesagtesten Hotspots und Geheimtipps der nooveeCities - aktuell und den klassischen Reiseführern immer einen Schritt voraus.

Kennst auch du tolle Locations, die bei noovee.com auf keinen Fall fehlen dürfen? Dann registriere dich jetzt! Schreibe Reviews und stelle deine Videos ein. Werde ein noovee Trend-Scout!

Kay.Salon - Berlin

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Passwort:  
Passwort vergessen?  
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Screenshot: Split-up of commission on [www.trivago.com](http://www.trivago.com)

In order to animate users to publish content, trivago splits up the commission earned by forwarding to travelling agencies and dispenses half of it to the users. The amount each user will get strongly depends on the number of reviews published and its validation by other users, so it is not just quantity which counts, but also quality. As can be seen in the example calculation, there is a huge amount of money to be scattered every period, in a test run with a short copied text from another homepage already 0,25€ have been earned.

But before implementing a split up of commission like this, the motivation of users to publish content has to be taken into account. As it seems to be a good motivation at first sight, there are studies revealing that there can be a loss of quality going hand in hand with paying the users as intrinsic incentives are destroyed by extrinsic ones.

### Wie funktioniert das trivago Anteilsprogramm?

Im Anteilsprogramm von trivago ist festgelegt, wieviel Community-Anteile Du mit Deinen Aktivitäten auf trivago verdienen kannst. Es gibt zwei Arten von Community-Anteilen: **Statusanteile**, welche Deine Mitgliedsstufe auf trivago beeinflussen (siehe hierzu auch unsere FAQ zum Thema [Mitgliedsstufen](#)) und **Bonusanteile**, welche lediglich einen Einfluss auf Deine Ausschüttung haben.

Zusammen ergeben sie **Deinen persönlichen Anteil an der Entwicklung der Community** und damit auch **Deinen Anteil am Erfolg von trivago**. Darüberhinaus kannst du für Sonderaufgaben (z.B. Kategorisierung neuer Länder etc.) Community-Anteile sammeln. Diese werden in deinem Mitgliedskonto gesondert angezeigt.

Die Community-Anteile werden kontinuierlich gesammelt und aufsummiert. In einer Abrechnungsperiode, die zur Zeit zwei Monate einnimmt, wird dazu immer das Geld, das trivago ausschüttet, gesammelt und ausgewiesen. Die **Höhe des gesamten Ausschüttungsbetrags** hängt davon ab, wieviel Umsatz trivago in einer Periode mit Reiseprovisionen gemacht hat.

**50% der Reiseprovisionen werden unter den trivago-Mitgliedern verteilt!**

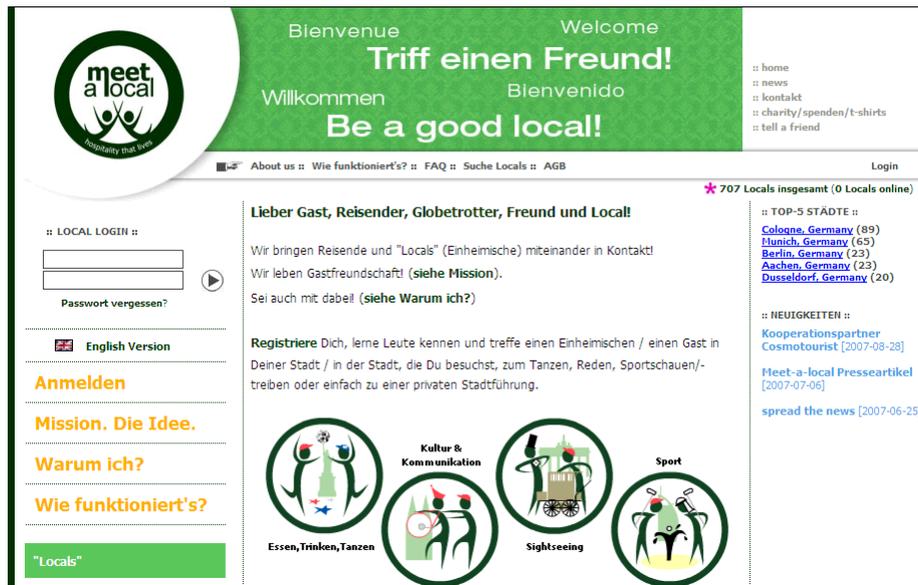
Zum Ende einer Abrechnungsperiode wird der gesamte Ausschüttungsbetrag den **Mitgliedskonten** anteilig zugeschrieben (erst dann entsteht auch ein Anspruch auf Auszahlung). In Deinem Mitgliedskonto siehst Du, wie viele Community-Anteile so schon umgewandelt und den Konten gutgeschrieben wurden. Am Ende der nächsten Periode werden Deine aktuellen Community-Anteile minus den bereits umgewandelten aus Vorperioden wieder in einen Geldbetrag umgewandelt und Deinem Mitgliedskonto gutgeschrieben etc. etc.

**Wie ergibt sich Dein Ausschüttungsbetrag?** (siehe Tabelle unten)

Erst wird Dein Anteil an den gesamten noch nicht ausgeschütteten Community Anteilen berechnet, hier 2,826%. Und dann mit der aktuellen Gesamtausschüttung multipliziert, hier 11.323 €. Insgesamt bekommst Du also einen Betrag in Höhe von 319,99 € ausgezahlt.

### Screenshot: Matching-Concept on [www.meet-a-local.com](http://www.meet-a-local.com)

A new trend of Web 2.0-based travel platforms is matching of people, either as travel partner from the same country or as local travel guide at the destination. The optimal "match" can be found by the interests and facts which can be seen in the user profile on the one hand, on the other hand, additional information on what the partner is needed for can be entered (as can be seen on the screenshot e.g. eating/drinking/dancing, culture/communication, sightseeing or sports). If this network starts working, a high user loyalty will be generated because of feeling as part of the community.



**Screenshot: Implementation of mobile devices on [www.plazes.com](http://www.plazes.com)**

www.plazes.com is the only homepage which is actively integrating mobile devices at the moment, but not yet by locating people with aid of GPS. The main idea behind this side is the connection of business partners as well as friends. Your timetable connected with the places where you will be can be entered (manually) and plazes.com will send you a message on your mobile if another person you are connected to is in the same town. As this concept is still quite new and in its infancy, no prediction on its potential can be made yet.



**Screenshot: Trend recognition and matching on [www.townster.de](http://www.townster.de)**

Townster.de is a German homepage already operating in the field of trend detection. But similar to www.noovee.com no semantic techniques are

used yet and the user has to rely on the subjective judgement of other users. But a new feature of this homepage is that it is also aiming at connecting people by “matching” due to e.g. the same favourite places to be and the same hometown.



**Screenshot: GPS-Tagging on [www.tiary.de](http://www.tiary.de)**

www.tiary.de is already using GPS-Tagging to mark places on a virtual map. This could be the first base to implement GPS-Tagging in combination with cell phones, so that people on holiday can be located and connected to the content uploaded which is tagged to their current location.



## F. The German Travel Market

Several websites found in the analysis deal with the German market only, but some of them are already planning to expand to other countries if their concept turns out to work. With respect to a further use case for Alexandria within the Theseus project, these homepages are introduced shortly in the following.

### [de.germaniki.org](http://de.germaniki.org)

germaniki is a travel guide for Germany created by the community, containing several inside information. Everybody who possesses a login can upload reports and photos on any German town or region and review content already posted. It is not possible to create a user profile. The homepage provides a German and an English version and a search function, furthermore guidelines for a corporate design are provided which can be filled in.

Unless the concept seems to be quite promising, the content uploaded is still sparse. The biggest and best known cities and towns in Germany are arranged, but hardly filled with content yet.

### [maps.myl2y.com/](http://maps.myl2y.com/)

maps.myl2y.com provides a virtual map on which spots containing sights can be marked and described. Originally, the focus is not laid only on Germany, but hardly any marks outside Germany can be found up to now.

It is possible for any visitor to view all content posted and to make use of the search function, the login is just needed to post something new.

### [www.pointoo.de/](http://www.pointoo.de/)

Pointoo offers a virtual map on which locations can be marked and descriptions can be uploaded. This content is gathered in an online travel guide which already is rich of content and convincingly well structured.

A Registration is needed to post new content, but all content can be viewed by any visitor. Two search functions are provided (What are you looking for? In which are you searching?). This homepage is striking due to its intuitive menu and the good structured editing of data uploaded. Pointoo is part of the Holtzbrinck group.

### [www.townster.de](http://www.townster.de)

Townster is the only German website in this analysis dealing with trend identification. A registered user can submit his actual location and his favourite places to be in the whole world. Due to these facts, matching

persons with the same preferences will be suggested. Furthermore, trend detection is taking place due to the number of posts for one place, the usage of some trend scouts at site and a validation function.

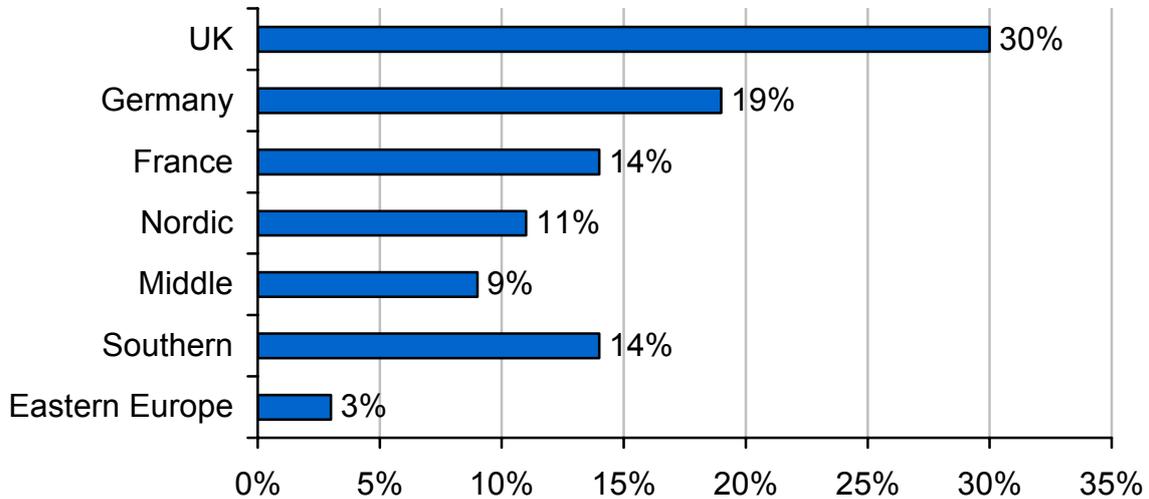
This page contains functions to register, validate, search for persons and upload, edit and search for locations, events and lists. Furthermore, groups can be founded, searched for and joined.

## G. Segmentations and shares in the European online travel market

Trends in online travel market size in Europe 1998-2007 with projections to 2009

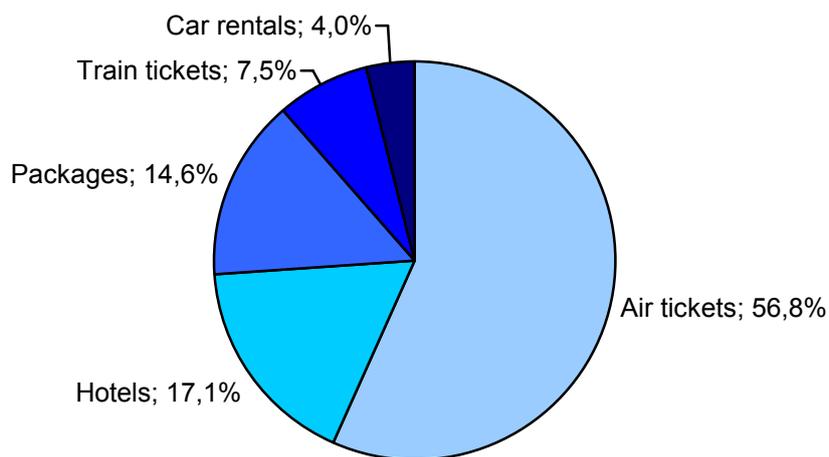
Year	Market (billion €)	Internet sales (billion €)	Internet sales in % of market	Internet sales increase in %
1998	200	0.2	0.1%	N.A.
1999	212	0.8	0.4%	257%
2000	227	2.5	1.1%	216%
2001	223	5.0	2.3%	99%
2002	221	8.9	4.0%	77%
2003	215	13.9	6.5%	56%
2004	220	20.8	9.5%	50%
2005	235	30.2	12.9%	45%
2006	247	39.7	16.1%	31%
2007	254	49.4	19.4%	24%
2008e	260	58.4	22.5%	18%
2009e	266	69.9	25.2%	15%

### Geographic status for the European online travel market 2007 (49.4 billion €)



Source: Carl H. Marcussen, Centre for Regional and Tourism Research, [www.crt.dk/trends](http://www.crt.dk/trends), 28. Jan. 2008

### The European online travel market by type of service in 2007



Source: Carl H. Marcussen, Centre for Regional and Tourism Research, [www.crt.dk/trends](http://www.crt.dk/trends), 28. Jan. 2008