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The Semantic People Information Network

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Work programme topics addressed

ICT-2007.4.2: Intelligent Content and Semantics

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Proposal abstract

SPIN's mission is to set the framework in which people will create, share and access multimedia information in a much easier, more intuitive and successful way that they can do now. In order to achieve it, the core research objective is to bridge the worlds of media semantics research and social media. These two areas have already achieved success, in different scopes, but their combination will really enable full use of machines and networks to interconnect people.

The work in SPIN will be directed towards the creation of a system that can be defined with the project name: *Semantic People Information Network*, and described by the following four elements:

- *Semantic*: the area of social tagging will be developed against a solid theoretical background rooted in knowledge management. Process modelling, creation and population of semantic structures, reasoning, semantic linking and semantic coding will ensure that the system acts intelligently in order to maximize the exploitation of available data.
- *People*: individual citizens, groups and communities, and professional users will be at the centre of the project. SPIN will analyse their cognitive interactions with social media, establish human-centred requirements, develop access interfaces and assess usability. Fine-grained personalization will further help interactivity.
- *Information*: SPIN will concentrate on audiovisual informational content, i.e. a superset of news media referring to any type of factual information preferably in A/V format.
- *Network*: the infrastructure will work as a collection of interconnected cooperating nodes. It will enable efficient media access and delivery, and link user-provided information to mainstream media, interconnecting both worlds.

The project results will affect the way social media networks are constructed and maintained, and push further the limits of managing an ever increasing amount and a growing degree of complexity of information resources.

SPIN is backed by a strong consortium of 12 companies, research institutions and user organizations.

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1.1 Concept and objectives

1.1.1 Background Motivation

User-generated content is flowing steadily into the mainstream, through personal blogs, community spaces (*MySpace*) or specialised areas created within mainstream media sites (*http://blogs.guardian.co.uk/news/*). Some of it gets also finally delivered through traditional broadcast channels, either after having achieved popularity in the emerging channels (such as *YouTube*) or by means of programs specifically constructed to tap into user content. A closely related realm is that of "grassroots journalism", in which people interested in what is going on around their area of influence get together and collaborate to create lively local news and discussion forums.

Some of the biggest Internet success stories of the latest times are directly related with the overall phenomena of social media (*YouTube*, *Flickr*, *De.licio.us*, *MySpace*, *Wikipedia*, *Digg*, etc), through its different variants (blogs, content communities, social networks, wikis). These and other instances exemplify some common features of social media[1]:

a) Participation: contributions and feedback from everyone is encouraged. Voting, feedback, comments and sharing of information is welcome.
b) Openness: There are rarely any barriers or controls to accessing and making use of content.
c) Conversation: instead of traditional "broadcast" content (one to many), social media is often seen as conversational (two way communication).
d) Community: social media allows communities to form quickly and communicate effectively around common interests.
e) Connectedness: ubiquitous access and seamless links between places are sought. Aggregated content is one typical feature..

As bottom line, social media blurs the line between the concept of media and audience, and between producer and consumer (creating a new "prosumer" category). It can also be assumed that most prominent content sharing portals owe much of their success to the simplicity of participation.

The problem is, however, that achieving selective access to content of interest is far too difficult. In view of the enormous volume of data that is already available and of the fact that it is scattered across many sources simple browsing has become largely infeasible, and queries are delivering less than satisfying results. This drawback is partly due to the above mentioned simplicity, which limits the quality of the metadata added to content, and partly to the ineffective use that is made of available data during retrieval. The problem is particularly pressing for audio-visual content, since it is very difficult to structure and characterize; community tagging systems help to locate and manage content with generic requirements, but they break apart when more specific information is sought, or when there is simply too much data available. Personalization aspects (either for individuals of for interest groups) in social media systems are still too primitive, and rely mostly on explicit user settings.

[1] http://www.spannerworks.com/fileadmin/uploads/eBooks/What_is_Social_Media.pdf.

The following example can serve as an illustration. Searching for text based information using the keywords “Hurricane Katrina” through Google resulted in a Wikipedia article of the respective name on rank one, which provides a well structured overview of all facets of the catastrophe from meteorology to politics (lacking AV information though). Compared to that the internal search facility of *YouTube* also delivered a large number of hits (7490) for the same two keywords. Those hits, however, were presented in an order that appeared to be completely random. Even guided by the available preview images, headlines, descriptions and further tags it remained a virtually impossible task to decide about the most relevant of the found files.

Given that no single video production covers the whole story in the way the Wikipedia article does, an orderly arranged presentation of the many results distinguishing e.g. between descriptions, reactions and pleas, between physical and societal impacts, and also indicating temporal or causal relations would be highly desirable. Such an accomplishment, however, could only be based on the availability of formal semantics for data management and query processing.

On the other hand, a lot of research interest and effort is continuously flowing into the area of semantic structuring of media content (the so-called semantic gap); however, despite remarkable progress, many of the practical problems of annotating media are yet to be solved.

In particular, the power of the collective intelligence of a massive amount of users and contributors is yet to be exploited. It is clear by now that the extraction of meaning from media is an extremely hard problem, for which no complete solution is envisioned in the medium term, even though it would open up a whole new world of applications, services and products. In particular, exploiting the potential contribution of social computing, similar to Wikipedia, is a promising ways of overcoming the meta-data bottleneck. Any complementary information that can be gathered around media content is therefore a firm candidate for improving the process.

In summary, although social media systems offer new solutions and approaches to the problem of content structuring and access, they have problems on their own, while “traditional” approaches to media semantics have not achieved definitive results yet. SPIN is positioned to effectively merge the best of the two worlds. Through a “semantic butterfly effect”, what some people produce online can reach and influence other people, both known and unknown, and empower them with new tools to use for their work and their leisure.

1.1.2 Project Objectives

The fundamental core research objective of the SPIN Project is to bridge the worlds of social media and media semantics research. Work will be directed towards a system (SPIN, the Semantic People Information Network) that facilitates multimedia sharing of current content through the use of knowledge and semantics.

We can further decompose this goal into a number of more concrete objectives, which are mentioned in the following paragraphs.

Modelling of cognitive processes in social media systems

While it seems obvious that people are communicating with each other through the process of media sharing, it is less obvious what the basic elements (intention, message and effect) of such communicative acts are in a given case. After retrieval the human receiver is usually able to both perceive the message and to infer the sender intention from the content s/he sees or hears. Before that, however, the information often remains incomplete, and the decision to

download something can therefore prove wrong. For example a video clip tagged “funny” or “lol” expresses the sender’s amusement and probably his intention to amuse the receiver but not the content itself. On the other hand a clip tagged with “sailing” might explain what sailing is, or that someone is sailing, or that the viewer should go sailing etc.

Therefore in the project we will research what people are trying to communicate, how they are trying to encode this with the existing annotation tools, and how successful they are in achieving the desired effect. From that we will draw conclusions concerning the required metadata and their presentation for an effective communication in social media system.

Merging formal and social semantics for media content description

Knowledge expressed using formal semantics (ontologies, crisp metadata) can enable very rich and powerful representations of content, amenable to operations such as reasoning, query expansion, relevance ranking, fuzzy matching, etc, which can greatly improve media retrieval and management. However it is hard to produce and rigid (updating the model is a tedious process), and not suitable for end users.

Conversely, social tagging is an easy process (it has been proposed that it fits better cognitive processes than strict classification) and quite intuitive. Although in theory it is highly imprecise, in reality scales up well, in fact most of its power stems from a scale factor, so that the benefit that can be obtained is generated by having a critical mass of people within the social network collaborating into it. However, it is plagued from limitations derived from its informal generation. As such, synonyms, case, morphological variants, polysemic words and insufficient definition capabilities of single-word tags all cause shortcomings in matching and search.

A key advance of SPIN will be to make possible creation of formal knowledge by data mining into social tags, mapping to knowledge structures and use of users’ and media contexts to improve discriminating capabilities. So tags will be enriched with information about the source users, context domains and related tags to be able to infer true semantic relationships and interact with the semantics extracted directly from media.

Dynamic multi-level personalization

Though some configuration of social media systems is nowadays available, it is mostly limited to user interfaces, moreover it is static and needs to be explicitly made by the user. SPIN will enable dynamic personalization by means of automatic creation of user profiles, based on their past usage history. Personalization will be pervasive across SPIN, and it will influence how users search and retrieve content, how they tag it, and also how the system uses the annotations that people have contributed.

Moreover, to enable different degrees of adaptation to users, the personalization subsystem will be built at different scales, considering profiles adapted to single users as well as profiles created and managed for user clusters (grouped according to expressed interests or labels). Default profiles (built e.g. using stereotypes) will also be enabled to allow personalization even in the absence of specific characterization of users. More than one level of profiles can be active at the same time, and composition of the overall effect of those levels will be used in those cases.

Intelligent automatic sharing of media content

An ultimate goal is that distributed pieces of knowledge contained in multimedia files will be automatically combined into higher units and thus provide ready-made information for users.

A key advance is expected to come from the behaviour of people in online social networks and their influence in information management. The structures that tie people together in online communities and their interactions can be used to harvest additional knowledge about the information they interchange, and foster new possibilities to make use of media and create services.

To a great extent, content will not need to be explicitly published. Instead, content intelligence will enable automatic arrangement of items into publication structures. Sharing of content will be done through a hierarchical communities arrangement, in which items get distributed based on dialogue between the items and the network nodes (a sort of "semantic communities system" to distribute news items).

The system will be transport-agnostic, so that the semantic foundations can be built on top of already existing community networks. The use of semantic coding will improve efficiency in the propagation of content.

Local clusters will transfer content of local interest, as defined by communities. Items that "resonate" within a local chapter due to higher attention received will get propagated beyond, to reach a wider audience.

Content pieces will be able to be reused at any place across the chain. Commenting on information will produce modifications in the content itself. A properly set metadata layer will ensure that all originating sources keep full credit for their content.

Linking user-generated content to mainstream media

People create media to satisfy a number of different needs. The purpose is not necessarily to get maximum coverage or reach audience, and this is one key distinction with regular news content. Nevertheless, some of this personal content does have value for others and potentially a wide audience, and as such it will be appreciated by standard players in information production (news agencies, broadcast media, communication companies). Therefore, it is expected that the flow of information within the SPIN network will be monitored by professional users; conversely, media organizations can feed the network with items and background information on selected topics for further elaboration by the community.

To that aim, "super-nodes" located within the SPIN network will gather selected content and structure it to get integrated into professional environments. Media professionals will work at these 'super-nodes' to help the transition between local content and mainstream media, and a number of semantic tools adapted to professionals will be available to them.

A number of mechanisms tailored to the metadata will make possible that users get full information on the usage of their content, and participate adequately in any final revenues obtained from it.

Summary of objectives

The following table summarizes the most important SPIN innovative objectives, together with the envisioned means of verifying their achievement.

Objective	Means of verification
To bridge the worlds of social media and media semantics research	Final SPIN system and framework and technical verification (see WP6)
Creation of formal semantics from annotation clouds provided by social tagging	Validation of automatic semantic structuring system (see WP5)

Research on what people are trying to communicate, how they encode this with the existing annotation tools, and how successful they are in achieving the desired effect	Output of the psychological analysis of user generated content descriptions (WP2)
Personalisation and automatic adaptation to users and groups	User validation (WP2), monitoring of the automatic creation and update of profiles (WP4) and system demonstration (WP7)
Audiovisual content propagation based on user interests	Availability of media propagation and delivery platform (WP4) and system demonstrations (WP7)
Provide interfaces and systems for social media management (tagging, linking, searching, accessing)	Tools and applications for media management available (WP4), and user validation of them (WP2)
Improved search performance on audiovisual content	Validation of media search engines (WP5)
Creation of tools for information professionals to interact with social online communities	Expert validation by SPIN user organizations (WP6)
Extract semantics from audiovisual media and characterise content through multi-modal learning and reasoning tools.	Technical validation of metadata extraction and characterisation (WP3)

Figure 1 illustrates the targeted interaction between people, technology and the SPIN network.

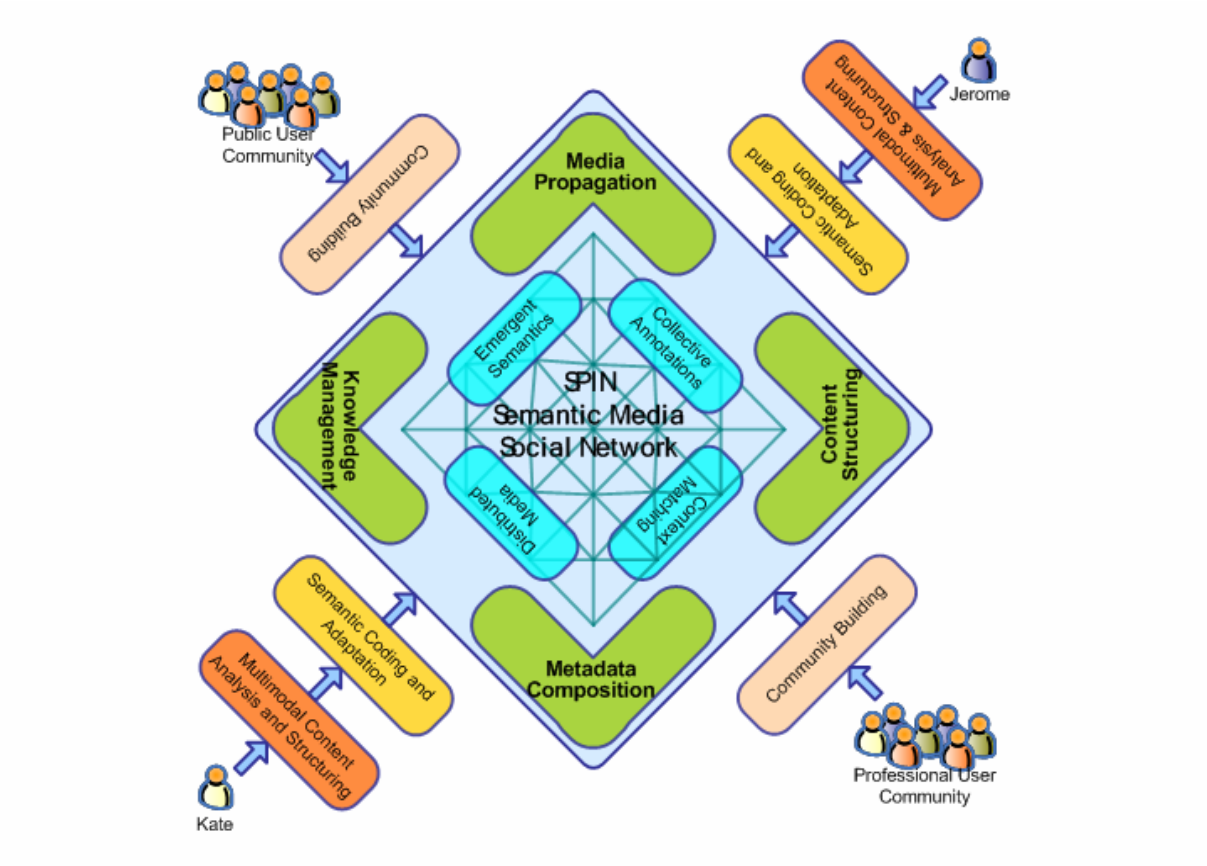

Figure 1: The Semantic People Information Network.

Imagining the future: a SPIN-enabled scenario

Kate is a young architect who loves long walks, capturing whatever catches her attention, using her 4G high-resolution mobile handset. Last weekend she was wandering in the streets of Oxford when she noticed a Gothic church which had been under restoration for months, but had finally had the scaffolding removed. She immediately used her MPEG camera to record a long take of the church, panning across all the sides of the building, also taking a few snapshots of interesting details. When she got back home, she used the *SPIN home-suite* to upload that content (video & snapshots), tag it as the "new look of the restored St. Paul Abbey", created a new content piece and shared it with her friends and fellow architects.

When creating the content, Kate used the semi-automatic *SPIN creation* system, which analysed the media pieces and helped her to create the content in an adequate way, mixing content and snapshots according to her tastes. It also generated properly adapted versions for delivery, using semantic coding to ensure that the really relevant aspects are preserved even for limited resolution versions.

Making use of the tags that Kate had included (and also of past history of Kate's annotations, which helped to infer relevant knowledge) the key concepts in Kate's new piece were set. Those concepts were immediately propagated through the SPIN network and compared with what other people had been creating. As it turns out, two months ago there was an accident during the restoration works and a section of a tower window fell down (luckily no one was hurt). Kevin was passing by, and happened to catch the incident with his handset; later on he uploaded it to the SPIN network. The system is now able to use knowledge from the media to match corresponding elements in both clips, and therefore can now automatically offer a view of the accident followed by the aspect it has after being restored.

A third element comes now into the picture: the original historical aspect of the church, supposedly the one that has been guiding the restoration. This was provided by the town council within a book containing a series of photographs taken at the beginning of the twentieth century. Since they were released to the public domain a number of people have uploaded them to the network, in different subsets and at different times; adequate reasoning and content management has enabled SPIN to gather the full set of photographs from the available subsets, correctly labelling them, and removing duplicates (preserving the highest resolution and quality). Therefore, it is now possible to browse the complete album of photographs online, adequately ordered and classified, and to compare it with the restored church.

A section of the tower was so badly damaged that even in those old photographs it was already absent. In fact, the restorers also used SPIN to locate pictures and drawings of similar towers, built around the same period and in the same style, to help assess the aspect that section should have in order to keep style consistency.

Jerome, a reporter of the national news agency, used later the knowledge fed and created within the SPIN network for a different purpose. When looking through the media piece created by Kate he noticed some architectural elements laying aside that did not seem to belong there. A further search and navigation through SPIN helped him to uncover the source: they came from a different church that coincidentally was being modified by the same contractor. Further investigation confirmed the suspicion: the company had been involved in irregular practices, re-using elements from other places to cut costs.

1.1.3 Relevance to the Objectives of the ICT Priority

Creation, access and sharing of audiovisual content is a business that has accounted for a significant percentage of world GDP over the last few decades and is growing continuously. The more recent phenomenon of social media underpinning the SPIN project is rooted in classic multimedia and Internet business models. This new trend is vastly impacting conventional business models and originating some of the most successful enterprises in the

sector as *YouTube*, *Flickr*, *De.licio.us*, *MySpace*, *Wikipedia*, *Digg*, to mention just a few of them. As stated before these enterprises are based on the principle of social media which includes participation, openness, community building and sharing of prosumer generated content in a fast growing business area that is generating substantial revenue every year.

This emerging industry is based on three concepts: content creation and processing, access and sharing. Content creation and processing tend to merge into a single area while access and sharing depend on both creation of metadata and content structuring or indexing. The latter is an area in which Europe has taken a strong lead with main European players pushing forward standards and developing groundbreaking technology. This, together with the heavy support given by the ICT work programme to projects in the Intelligent Content and Semantics area, aims to bring Europe to a world leading position in the production and delivery of semantic foundations for audiovisual content. This in turn is also the basis for technologies related to social media as targeted in SPIN. The underlying emerging models making up the social media concept are becoming a significant part of a modern economy. As a consequence, it is critical that Europe maintains its ambition to become a world leader in related business providing novel added value to smart social oriented services.

This ambition is challenged by few important factors: the exponential growth of prosumer generated content; its distributed and heterogeneous nature which makes it extremely difficult to manage; and the lack of metadata to support an efficient end-to-end content flow in the business environment. Since SPIN target solutions for these challenges, aiming at improving the performance of European multimedia providers and to facilitate customised access for European citizens to digital video databases, its impact in the growing multimedia sector can not be ignored. SPIN will provide solutions to central ICT issues such as personalized access to distributed audiovisual content and contribute to enhance the position of European industry in the area of efficient, customised and dynamic media. It will also define requirements that we expect will influence world-wide multimedia standardisation processes currently led by Europeans.

SPIN media focus

The type of content that flows through social media channels can have many different flavours, according to subject, intention, mode of creation, genre, etc. Although many characteristics can be shared regardless of the content type, in order to be able to focus the project and achieve results within its timeframe, we will mostly concentrate in one type of genre – that of ***audiovisual informational content***. This can be thought of as a superset over the concept of multimedia news (which has a *mainstream/broadcast* flavour we want to avoid), and therefore concerns any type of factual data, with typically an associated temporal and spatial frame (i.e. it is "something that happens somewhere at some time").

Therefore, for the sake of project practical purposes we are excluding to deal with such content types as fiction media, or purely artistic productions, although we envision that SPIN results will eventually be also applicable in those contexts.

Relevance to Objective ICT-2007.4.2 Intelligent Content and Semantics

The Intelligent Content and Semantics objective is framed within Challenge 4, one of whose main aims is to be able to link content and knowledge, and to make them pervasive and usable by both people and machines. Collaborative services and user communities for content production and distribution are a key target. Therefore SPIN fits neatly within this overall frame. SPIN will enable mechanisms for the realisation of this strategic objective allowing

Europe to become a leader in important applied technologies central to audiovisual management. The successful implementation and validation of the SPIN ideas and its overall vision will result in clear scientific advances in the field and will provide the foundations for increased industrial competitiveness in this sector. The project will demonstrate how these benefits will accrue to future users of the technology developed. The work of SPIN offers a proof of concept for more advanced and efficient networked systems while enabling secure services for new appealing business models. This proof of concept will support Intelligent Content and Semantics' vision of high added value multimedia content and services.

A parallel between SPIN objectives, key objectives of the ICT-2007.4.2 Intelligent Content and Semantics area and specific topics addressed in this call is elaborated in Section 3 of this document.

1.2 Progress beyond the State-of-the-Art

As mentioned, social media systems have already been deployed very successfully, and they have proven to be scalable in terms of capability to handle and delivery high volumes of content. However their outcome in the field of content structuring and location of media remains incomplete (it is nevertheless more than enough for many applications, and that is one reason for its success). A challenge that SPIN will address is to keep simplicity in user processes but achieve much more powerful results by mean of further exploitation of generated metadata.

Some of SPIN fields in which advances over the current situation is envisioned are mentioned below.

Modelling of user behaviour

A fundamental theoretical framework suitable to describe human communication is that of speech act theory. Speech act theory has revealed that communication events can be sorted into a limited number of categories differing in the kind of message they encode (states of mind, states of external reality) and their desired effects (beliefs, actions). While speech act theory has been developed through analyzing language behaviour, it is by no means limited to communication based on linguistic signs. Applying speech act theory to other types of signs has nevertheless always been difficult, because any speech act comprises a message in the form of a proposition, and images (still or moving) for example are often thought of as containing only concepts.

A number of publications including David Novitz's book titled "Pictures and their Use in Communication" (1977) have been able to clarify the matter somewhat. It is now known, that even, if an image is only meant to represent a concept, the context in which it occurs, will determine, whether that image-concept functions as an argument or as a predicate, and also provide the missing part of the proposition. For example a photograph on Mary's homepage showing Peter and annotated with "Peter" is equivalent to the assertive speech act "I herewith inform you, that Peter *looks like this*", in which the part in italics (the predicate of the proposition "Peter looks like this") is present in the form of a picture, whereas the tag is its argument.

The exact rules of composing such speech acts and of disambiguating image meanings through contexts in order to understand the speech acts are as yet unknown. We will advance the state of the art by studying those questions in the limited context of social media systems.

Semantic extraction from multimedia

The problem of automatic annotation for search and retrieval of audiovisual content is very difficult to solve and will remain open for years to come (the semantic gap, yet again). Early attempts to address these issues concentrated on visual similarity assessment via definition of appropriate quantitative low-level descriptions as in EU-funded projects FP5 NoE SCHEMA (multimodal analysis for metadata extraction) and STREP BUSMAN (low-level analysis for access and retrieval).

While attempting to move from low-level perceptual features to high-level semantic that simulate human cognition, research focus shifted to the exploitation of implicit and/or prior knowledge. The explanation of domain specific knowledge is usually utilized for effective semantic higher-level descriptor derivation, symbolic inference, and annotation propagation as in IP aceMedia (adaptation and autonomy of still images) and NoE K-Space (automatic semantic inference from multimedia content).

The semantic gap problem can be alleviated by using the well-known "annotation propagation" approach as in IP MESH (metadata creation for summarization and aggregation in the news domain) and STREP RUSHES (semantic inference and analysis of rushes content). The approach is simple: given a corpus of audiovisual content, a representative subset is manually annotated and then low-level similarities between content items are used to propagate the annotations through the whole corpus/database. This approached is underpinned by well-established clustering and learning techniques. Two types of approaches can be easily identified for this purpose: implicit approach realized by machine learning methods, and explicit one realized by model-based approaches. The usage of machine learning techniques has proven to be a robust methodology for discovering complex interdependencies between content and perceptual higher-level concepts, as well as a way to further propagate these relations. On the other hand, model-based content analysis approaches make use of prior knowledge in the form of explicitly defined facts, models and rules, i.e., by providing coherent semantic domain models to support semantic inference in the specified context.

To the best of our knowledge the process of annotation propagation has been used either on the basis of classification results with doubtful confidence values introducing the danger of propagating erroneous information, or on the basis of dedicated human annotators producing the propagation seed on a selected "training set".

SPIN brings in a novel aspect by proposing the propagation approach for automatic annotation of distributed community generated content. Within a community some individuals are keener to annotate their own content than others. SPIN does not force any one to do annotations neither impose annotation standards on a community of content producers. It rather proposes to allow users (prosumers) to do what they wish to do anyway, without interfering (it is well known that one can not impose formats, template or standards to the user, and specially formal metadata specifications such as MPEG-7 are impossible to use by non-experts).

The SPIN system learns from the networked community and applies the propagation approach in the background. It maps the bulk of community tags into predefined knowledge formalism enabling relational and organized representation of variety of results. If you are a user of SPIN your content will get automatically annotated by the system using annotations from other users in the community and you will be given a chance to contribute and define new annotations.

This is a novel annotation model requiring research on social aspects of community building as well as conventional propagation technology within a generalized environment. The learning approaches required to realize such functionality need generalization to cope with the

social and network aspects involved. Such social aspects will be used to deal with the critical problem originated from the heterogeneous nature of community generated content.

Interaction processes in social networks

Content delivery through networks is traditionally divided into push (distribution) and pull (retrieval) models, depending mostly on the role the user plays in the transfer of media. The availability of full semantic metadata about content, and of explicit or implicit information on users interests, stored in user profiles and continuously updated through user actions and behaviour, makes possible a mixture of models. In it users request media (pull) but based on generic interest or through context operations, while the final content is chosen by the system and delivered (push) after proper filtering, ranking or semantic reasoning, either physically (i.e. file transfer) or logically (through link populations, alert messages, etc).

Furthermore, the environment enabled by social networks allows continuous interaction between users, so that some users or group of users may push content to others as recommendations, either addressing then explicitly or through semantic matching of interests within the SPIN network. So a perhaps not that novel but still valuable side effect of the SPIN concept is its use in recommender systems. Clearly, SPIN will also generate great recommendations and add value to existing recommending systems.

Social media is an important trend that extends the role of users from content consumers to producers not only in media but in other areas as well. In the future, web-based services are increasingly seen not as ready-made solutions but as a platform that provides users with tools for creating their own kinds of services. Even though most of the current applications still concentrate on entertainment, social media has great potential for everyday applications in which people interact with information, with content and with each other, and also for use in companies both internally and externally for interacting with their customers.

From the content or media object point of view, the most important change is the lengthened life cycle of media objects. In the traditional publishing models, the content selection at media object level was made by professionals who compiled the aggregations that then were offered to consumers as packages. As content has become digital and it has become easy to refer to and discuss single media objects, the life of a media object may be lengthened considerably. Media is also more and more consumed as smaller fragments - video clips instead of whole shows, single songs instead of whole albums[2].

The successful services give both immediate and longer term reward to the users and utilise content to connect people and build social networks. For example the Flickr service gives its users an easy way to share photos with friends, and by supporting public sharing Flickr has become a huge pool of photos – pictures from almost any town in the world can be found there. In similar way Del.icio.us offers immediate benefit by offering access to ones bookmarks from any computer and longer term benefits by linking to additional resources and other users with similar interests. YouTube has just launched a new feature that lets users viewing a video at same time to chat with each other. Users not only act as content creators but social interaction between users has become possible and visible in the applications. For examples users may create a new group for some topic and open it to other people to join it.

[2] Bäck, Asta; Vainikainen, Sari. Enhancing traditional media services utilising lessons learnt from successful social media applications – Case studies and framework. ELPUB 2007, the 11th International Conference on Electronic Publishing, 13-15 June 2007, Vienna, Austria.

These groups can become important for collecting and rating content relating to some specific topic[3].

In social applications the user experience is influenced by many factors: user interacts with other users, community, content from many sources, metadata and semantics. This can be studied both with traditional user study methods or the social media tools and processes themselves can be utilised in user studies[4].

Deriving semantics from social media

The most important feature of social tagging systems is that they do work, at least in most cases, assuming there is enough critical mass of users contributing to them. However they function on an ad hoc fashion, and while there have been attempts to formalize the knowledge processes going on in a network, the field is still in its early stages, and much less mature than other, more established areas such as formal semantics and ontologies, and statistical approaches to semantic extraction.

Capturing and producing content is cheap and easy nowadays. Everybody has a video camera or at least a handset with capturing capabilities. The immediate consequence is that digital content produced by "communities of users" can reach very quickly a critical mass of "raw knowledge". Such critical mass cannot be reached otherwise since it is the network of users and distributed nature of the process what enables it. A single company or large corporation like the BBC would need to invest too much money and time to acquire the same body of content and knowledge. The social network and community based production of content is like a swarm of mosquitoes. A single mosquito does not make any difference, few mosquitoes will go unnoticed, the whole swarm together makes a big difference. The knowledge embedded in such swarm of distributed information can be very valuable.

SPIN proposes to exploit such "community" knowledge. It proposes R&D to enable automatic extraction of information/knowledge/intelligence from distributed loosely networked community built content. ***This is a fundamental and novel aspect of SPIN; there have been initiatives to formalize the process of building knowledge out of personal annotations but they cannot generalize to different contexts or platforms***.

Another new contribution of SPIN will be in the use of user-provided tags to improve models and systems for automatic knowledge extraction. Relevance feedback provided by the user has been used extensively to improve result of content-processing systems. But it remained mostly as a tool to enhance retrieval, improving the match between the system results and the user query. In SPIN we plan to also use it to improve semantic extraction, making it go further down in the chain, so as to update analysis models and re-training of modules. This feedback will not need to be provided explicitly by users, but through exploitation of community tagging. Here the biggest benefit can again be mined out of the volume of informal annotations contributed, as exemplified by ongoing experiments such as the Google Image labeller (http://images.google.com/imagelabeler/).

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[3] Bäck, Asta; Vainikainen, Sari; Näkki, Pirjo; Reti, Tommo; Sarvas, Risto; Seppälä, Lassi; Hietanen, Herkko; Turpeinen, Marko. Semantically supported media services with user participation. Report on the RISE-project. http://www.vtt.fi/inf/pdf/publications/2006/P612.pdf 2006. VTT, Espoo. 99 pages.

[4] Näkki Pirjo; Virtanen Tytti. Utilising social media tools in user-centred design. CHI2007 workshop: "Supporting non-professional users in the new media landscape". 29 April 2007, San Jose, California. USA.

What's in a logo

The red butterfly in the SPIN logo is the well-known Lorenz attractor. It can be linked to some of the SPIN ideas:

- the continuously looping trajectories suggest the continuous flow of content within the SPIN network,
- the attractor is an example of a structure (meaning) appearing out of seemingly non-structured (chaotic) data, and it never repeats itself, and
- this attractor derives from atmospheric equations, and therefore has been linked to the "butterfly effect" (also because of its shape), in which a seemingly small event may get amplified and create much bigger results.

1.3 S/T Methodology and associated Work Plan

1.3.1 Overall Strategy

The SPIN vision is to bridge the worlds of social media and media semantics by instantiating related research into a system (SPIN) that facilitates multimedia sharing of audiovisual content through the use of knowledge and semantics.

To realize this vision, the work has been structured into meaningful units: work packages (WPs) and tasks. Some of these WPs are general, in the sense that they affect the complete system, such as the WP2 (the user work package), the “edge” WP, that works at both ends of the chain: at the very beginning (market analysis, user requirements) and at the end (usability validation), and WP6 that takes care of overall system architecture and integration. Others are specialised activities that address a component of the system; in that sense WP3-WP5 are planned in roughly chronological order from the point of view of system processing: first metadata extraction, then content production, then content sharing tools, then building of social sharing systems. Finally there are two non-research oriented WPs: WP7 on demonstration and WP8 on dissemination on exploitation. Figure 2 outlines the project structure and WP interrelations.

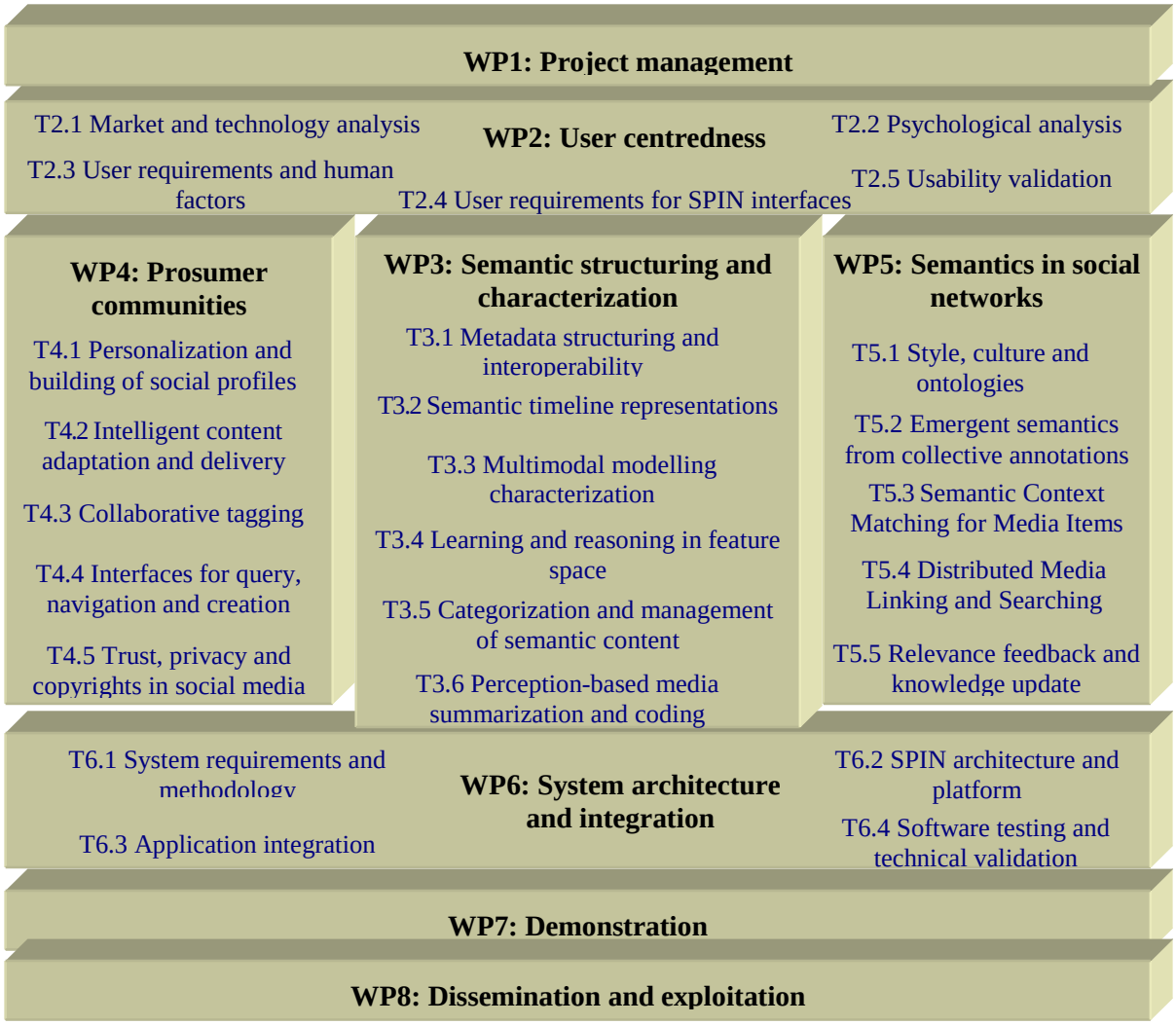

Figure 2: Project structure and interrelation between WPs.

The SPIN network will be a complete system for the processing of media generated, tagged and retrieved within user communities. Figure 3 shows our vision of the process workflow for such a system.

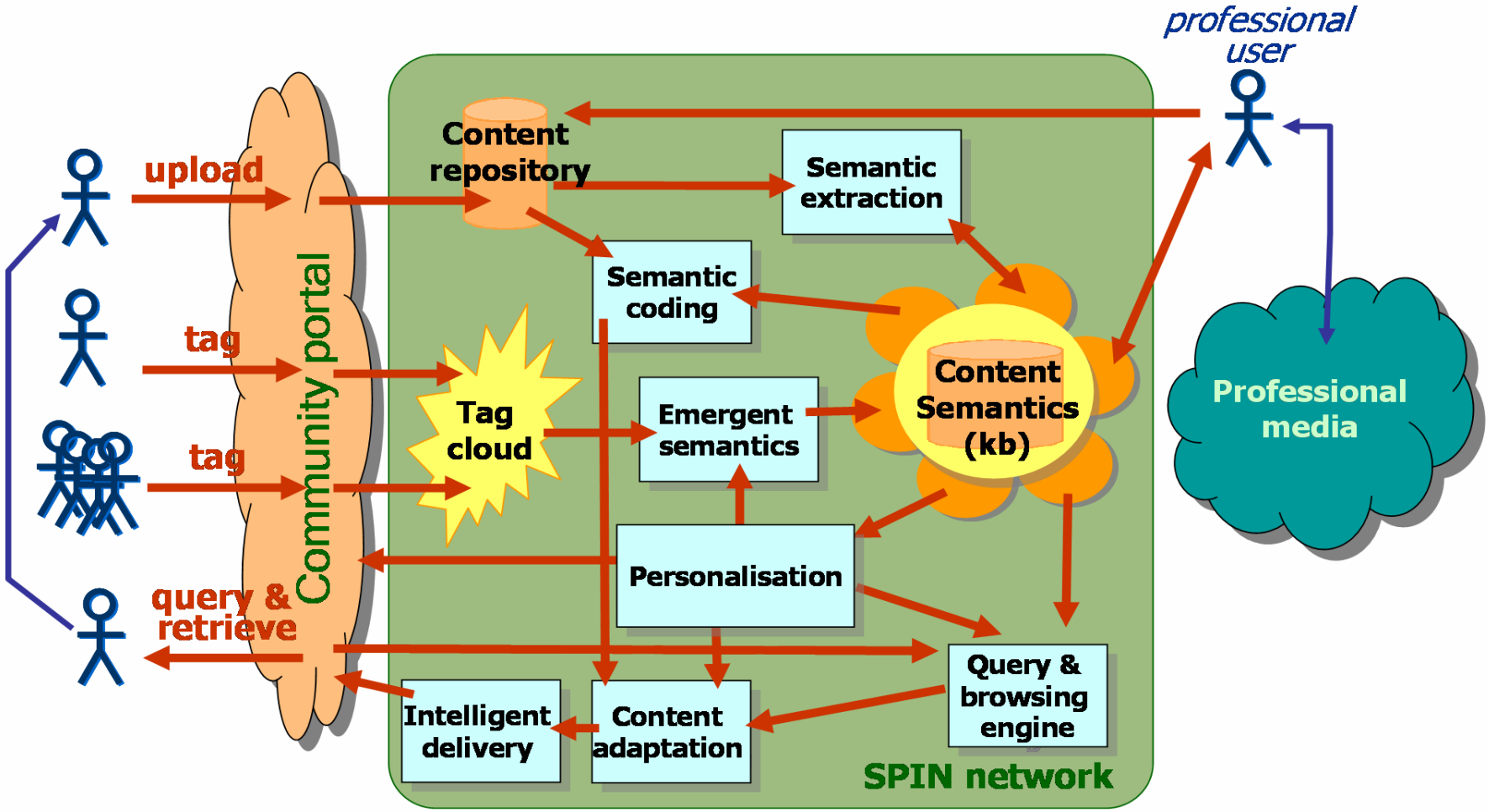

Figure 3: SPIN workflow

1.3.2 Workpackage Descriptions

The following paragraphs describe the objectives and main work items (segmented by task) for all technical work packages in SPIN. For each task also the task leader and task timing is shown in brackets[5].

WP1 Project Management *(HHI, M1-36)*

The project management activities and procedures are described in detail in the respective Section 2.1.

WP2 User-Centredness *(HHI, M1-36)*

This work package takes care of the human-centred design approach in the project. In the beginning of the project the work package identifies user requirements and studies market needs. The studies are focused on user acceptance of concepts to produce and utilize metadata in social media systems. Usage scenarios will be defined which concretely illustrate the kinds of solutions that the project is targeting. Throughout the project, WP2 carries out different user evaluation activities to study user acceptance of the proposed solutions.

As the project is focused on social media, social media is utilized in the user evaluations as well. The project utilises and further develops an Open Web Lab (Owela), originally created by VTT. Owela is an innovative research environment that extends the role of users from passive research objects by taking them as co-designers that discuss online with technology developers as well as other users about design decisions. Owela offers a flexible, efficient and innovative research environment where users can meet regardless geographical or time limitations. In addition to the Open Web Lab, traditional user evaluation methods such as laboratory trials and interviews will be also conducted. Towards the project end, the focus will shift to field trials where the SPIN solutions will be evaluated in actual long-term use.

Task 2.1: Market and technology analysis (ATC, M1-36)

This task will provide a survey of the existing trends and solutions for social media, compare their features, and identify potential user needs. The results will be used to create questionnaire items and discussion topics for the requirements process and also to assist in the development of exploitation strategies.

Task 2.2: Psychological analysis of user generated content descriptions (HHI, M1-18)

In this task the influence of user intentions for content sharing on annotations and their consequences for later retrieval will be studied. Sharing content has a pragmatic meaning, i.e. users want to inform or amuse others, to express themselves and so on. Those intentions are likely to influence the tagging process, and empirical data will be sought, which make that influence visible. From that we will draw conclusions concerning the required metadata and their presentation for an effective communication in social media systems.

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[5] For a full list of partners working in the task, as well as complete timing of activities, and lists of deliverables and milestones, see the detailed tables in Section 1.3.2.

Task 2.3: User requirements and human factors in SPIN technology (HHI, M1-18)

In this task the system features requested by different stakeholders will be investigated. The requirements process starts with defining a set of usage scenarios in cooperation with users, technology developers and service providers in the Open Web Lab (Owela). The scenarios will be further analyzed into use cases, which can be directly utilized in the technical work packages. From those use cases the system features will be derived.

Task 2.4: User-centred requirements for SPIN interfaces (VTT, M6-18)

In this task the special requirements for an optimal interaction with the social media system, with the media itself, or with other users will be captured. It is anticipated that those requirements can only to a limited extent be directly inquired from the users. Therefore a major part of the work will consist in inferring requirements, e.g. for presenting alternative choices for relevance feedback from cognitive hypotheses.

Task 2.5: Usability validation (VTT, M20-36)

In this task the usability of individual system components will be evaluated in the laboratory employing the use cases derived in T2.3, and towards the end of the project a field trial for the whole social media system will take place. In the field trial the conductors and the users will also communicate through social media, again using VTT's Open Web Lab (Owela) as a tool in user evaluations.

WP3 Semantic Structuring and Characterization *(QMUL, M1-M36)*

This WP develops technologies for metadata structuring supporting semantic coherence and data interoperability. It also defines reliable extraction of metadata in a multi feature space, using approaches for content-based low-level metadata extraction, including image and audio features motion primitives and available textual annotations. It further aims at devising a metric in a multi-feature space operating on content structures. Precise temporal analysis of the source video taking into account the specific nature of the content will lead to development of abstract time-line semantic models. Furthermore, an approach for shot characterisation will be devised based on advanced models for represent types of emotions and moods. The task for categorisation and management of semantic content aims at developing suitable approaches for semantic context aware analysis of the content, as well as a set of inference rules. Based on visual attention models, semantically meaningful areas of the video will be used for event detection. Video summarisation will produce summaries of long audio-visual content based on the available semantically structured metadata. The last task in this WP will use perception theories and attentional models for media summarization and coding according to what we call "semantic entropy" as opposed to conventional low-level information entropy. This WP is divided into five interrelated tasks:

Task 3.1 Metadata structuring analysis and interoperability (EFE, M1-18)

This task will specify syntax and semantics for metadata structuring that will support interoperability and functionality needed for the project. The metadata structures will include low- and mid-level media descriptors for searching and characterization, as well as high- level metadata and semantic tags for knowledge-based processing. Multimodal techniques will be used to infer the content structure. Task will also focus on reliable extraction of low- and high level metadata from images and audio-visual semantic units of a video. A multi feature space fusing together a numbers of low-, mid- and high- level feature design spaces for both audio and visual information will be modelled. Since content structures and appropriate

feature signature contain different "atomic feature" or features capturing content representations at different levels, from low-level to high level semantic, specific metrics have to be defined. In each of the different feature spaces, various similarity measures modelled to capture as much as possible human induced similarities, will be investigated and designed. At *QMUL* multi-objective optimization technique for discovering an optimal metric combining of several description schemas has already been devised. A generalisation of this method will be developed so that it can deal with any kind of descriptor mixture. Furthermore a set of commonly applied rules will be developed to express content coherence. The emphasis will be on structuring higher –level semantic tags in a way that allows complex interoperability relations among semantic metadata of different granularity. In this context advanced inference rules will be used to structure content and make it suitable for further analysis

Task 3.2 AV semantic timeline representations (QMUL, M1-30)

This task will deal with development of abstract time-line semantic models for audio-visual content. Different annotation modalities will be combined in a timeline representation using a number of audio, motion and visual features. The developed models will be rich enough to describe a variety of complex time-line relations at the same time enabling multimedia synchronization. They will enable representation and evolution of events in time while dealing with dynamic content. The goal is to enable efficient means for indexing for temporal and spatial relations of media streams and semantic objects.

Task 3.3 Multimodal modelling and content characterization (HHI, M1-30)

Temporal analysis of audio-visual content will be investigated and raw non-edited shots will be dynamically modelled in multi-feature space for high-level characterization and recognition. Temporal activity (high camera motion activity, background scene, object motion) will be used to improve recognition precision. The result of this analysis will lead to semantic structure metadata containing words from a well-defined taxonomy describing emotions and moods. In combination with suitable classification scheme for mood and emotion estimation, an approach for shot characterisation will be devised based on advanced models for representing types of emotions and moods. Further it will be explored how shots with strongly varying and diverse audio-visual content can be efficiently represented by multi-feature sets derived from sub-shots, where sub-shots are audio-visual decomposition units inside of shots. Using units smaller than shots can improve annotation quality and matching performance.

Task 3.4 Learning and reasoning in feature space (QMUL, M6-30)

This task will deal with the idea of extracting knowledge in large data sets using novel techniques for making sense out of multiple concept representations. This task will derive semantic using automatic classification based on content structured metadata for audio-visual content from T3.1. These technologies will be developed for identification of common situations with similar semantic meaning. This knowledge will be extracted through classification of identified content, using novel processing algorithms based upon multi-modal analysis. The obtained annotations will be used for extension of the knowledge base and for T3.5. Automatic indexed data resulting from different classifications will be cross-referenced for a combined result leading to a more effective learning strategy. This task will also define a number of reasoning approaches and use external reasoning logics that are defined in the community, to develop an efficient fused reasoner that will enable efficient reasoning over knowledge databases.

Task 3.5 Categorization and management of semantic content (QMUL, M12-36)

This task will derive semantic and automatic annotation based on modelled metadata for audio-visual content. It will also exploit the results of T3.1-T3.4 to define rules for mid-level semantic metadata. Technologies for semantic inference and classification will be developed for identification of scenes and extraction of high-level events. In combination with a set of context aware reasoning rules, higher level semantic features will be further generated. Within this task advanced algorithms for motion classification, genre classification, and text extraction from video will be investigated. Based on visual attention models, semantically meaningful areas of the video will be used for highlight detection. Video summarisation will take advantage of the low-level features and indexes extracted in previous tasks, as well as results from classifiers and inference models. This content management tool will produce summaries of long audio-visual content and combine similar video-clips from a number of videos into summaries based on the available semantically structured metadata from pervious tasks.

Task 3.6 Perception-based media summarisation and coding (QMUL, M1-36)

The task focus on the development of a new model that integrates conventional summarization and coding theories with knowledge-based semantic content interpretation. The basic difference with conventional models is that “perceptual entropy” is used to derive decisions on content redundancy, rather than conventional low-level information entropy. Knowing what is important in an image is the vital first step in semantic coding, and identifying the eye catching subject matter is central to this task. We will identify regions of interest using a novel methods derived from concepts of surround suppression of comparing neighbourhoods of content samples to discover areas that do, and do not match strongly with other areas in the same content. This provides a rank ordered set of regions that indicates which parts of the content can be summarized whilst still maintaining the same perceptual quality. Psychology of human perception and attention will be used to define the models that will drive the final ranking of content items according to their perceptual entropy.

WP4 Prosumer Communities *(VTT, M1-36)*

WP4 addresses metadata creation and collection and develops the necessary personalisation infrastructure needed to support metadata creation and displaying content in an interesting and interactive way. Particularly when dealing with user generated content, it is crucial that users are supported in generating metadata. This makes it easier to provide the metadata and also the metadata quality improves when users may easily utilise suggested tags. However, user generated metadata will always remain partly unreliable. Personalisation based on both user and community profiles will provide valuable support to improving the value of the user generated metadata and the user experience with the system. This also makes it possible to make user-adapted presentations of the available content. Personalisation needs to take into consideration also privacy of the users. WP 4 will create this personalisation infrastructure to support utilisation of personal and community profiles for metadata creation including the trust and privacy management.

Task 4.1 Multi-level personalization and building of social profiles (VTT, M1-24)

This task will develop concepts and tools for personalisation and building of social profiles for managing personal and social identities. Personalisation is required to let people access or utilise only the content and annotations that they feel relevant. This feature is growing in importance with the high amounts of content becoming available. Personalisation can be

made by utilising social profiles that contain information about users' interests, contacts, activities and demographics. The burden of making a profile can be made smaller if users are able to re-use profile elements when appropriate, and tailor the profile to different services. Also, by making the profile manager able to learn from user activities and user's interest groups and communities, the profile will become more useful. Social profiles also help in assessing metadata created by others when the metadata creator profile information can be utilised there.

Task 4.2 Intelligent content adaptation and delivery (STM, M6-30)

The user experience will be largely enhanced the more the content presentation takes into consideration the restrictions and abilities of the user, as well as the current device, environment and context. User abilities include visual acuity (e.g. large fonts needed, colour combination inappropriate), time available to the user; devices may have large or small screens, bandwidth limitations; the environment make be noisy or demand that the user make no noise.

These constraints will be taken into account when selecting and organising media assets into a presentation for the user. Selection and combination of media assets can also depend on the role of the media asset in the presentation as a whole. Also some refinements may be possible to make the content better suited to certain devices or environments. An example approach is to create a document structure, which contains a prototypical presentation to be communicated to an end-user.

Descriptions of the context and strategies for content adaptation will be developed. The process for making the decisions as to what to send to the device will be modelled and implemented.

Task 4.3 Collaborative multimedia metadata tagging systems (CWI, M1-36)

The task will define and implement concepts and tools which users can utilise to collaborate as a community to enrich information together rather than acting just as individuals. Creating tags becomes easier if users may utilise tags created by others to related resources. This also promotes adding semantic information to user-created tags. Existing tags and metadata may be utilised, when we can identify resources that are related to new resources being imported into the system. Related items may be recognised automatically with the help of the already existing metadata - for example timestamps and location information - or users may be offered resources from which the metadata may be copied. An example of the latter is a news item or event information that has been provided with relevant metadata by utilising microformats or RDFa. Hints as to what could be relevant can be acquired from the user: inferences can be made based on the tags that the user creates, or user may indicate other users or groups with related material, or users may place their resources on a map to give location information. Tag visualisations will also be utilised to help in metadata creation. Underlying ontologies play an important role in providing suggestions as to the relevant metadata. For audio-visual resources, annotations may be added utilising temporal/spatial decompositions.

The task starts with defining the use cases for this contagious tagging approach. The system will be implemented in a stepwise manner: first supporting free-from tagging will be implemented, and after that, semantic structure will be added to offer additional support for metadata creation.

Task 4.4 Interfaces and tools for media query, navigation and creation (CWI, M6-30)

The role of this task is to create interfaces where users can commit content to a repository and add their own descriptive tags (annotations) as well as query and explore content and annotations of their own as well as that of other content providers. The interfaces will offer personalised navigation and clustering. Interfaces depend on the user's information need, example interface types are explorative, information gathering or presentation generation. The system needs to be able to handle content and annotations appropriately and features for managing queries and results of the queries are developed in this task.

Explorative interfaces allow users to explore the types of information in one or more repositories. Interface style could be, but should not be restricted to, an extension of faceted browsing. Information gathering interfaces support the user in looking for different pieces of content about a particular topic. The user will carry out multiple searches and collect operations. The system will supply tools for allowing the user to organise the material during and after they are collecting it.

Presentation generation interface presents the requested information in a "ready-to-publish" way. That is, an attractive looking presentation containing salient information. This requires the system to support the organisation of the material that has been found. It also requires more knowledge of the user in order to achieve it.

T4.5 Trust, privacy and copyrights in social media(VTT, M6-30)

This task looks at the trust, security and privacy related issues within the social media. User requirements related to managing trust, privacy and copyright will be gathered in the WP2 and utilised here as a starting point. Key issues are such as how users assess the security and reliability the information that they get from social media applications, and what can be done to improve the reliability. The outcome will specify trust levels for annotations and users and the metadata layer for handling content usage information in order to ensure that all originating sources keep full credit for their content. The solution will respect privacy and anonymity preferences from users.

WP5 Semantics in Social Networks *(TID, M1-30)*

WP5 is concerned with the creation of the link between the semantic structures defined and populated in WP3 and the social network system enabled by WP3. As such, it will work both ways, to make available semantic information to user communities through optimized flows of metadata, and to enrich the knowledge structures by analyzing the information provided by users of the system.

Task 5.1: Style, culture and ontologies (UIBK, M1-24)

This task will perform a formal modelling of the process of interacting with social media, especially including tagging and annotation of content. The work will consider user contexts (as developed by WP) and the mental models in different (sub)cultures and groups used to conceptualize reality[6], to account for cultural and social particularities that influence social media processes, as well as differences in creation and annotation styles. Adequate use will be made of the metadata models developed in WP3 for semantic characterization, so that WP3

[6] E.g. a body piercing may be conceptualized as a means of self-expression in the Gothic scene, but as a wound in a medically oriented community, and corresponding photographs will be annotated completely differently by the respective members.

and WP5 processes will be linked together. The outcome will be metadata knowledge structures to be populated and used in the rest of WP5.

Task 5.2: Emergent semantics from collective annotations (TID, M6-30)

People interacting with the network will the collaborative tagging system developed in T4.3 to add annotations as free-form tags. The purpose of this task is to be able to extract well-formed semantics from those tags, and therefore make the transition between user input and formal knowledge management. In order to do so, the following inputs will be considered:

- The user-provided tag cloud
- Context information about those annotations: users making them (and their confidence levels as taggers computed by T4.5), time and context of annotations, concurrent annotations from other users and groups, past relevance feedback provided by users, etc
- Automatic semantic extraction on the annotated content, as provided by WP3
- The metadata model for media semantics produced in T5.1
- Adequate inferencing rules within reasoning components and trained statistical models.

The outcome will enrich the contents of the metadata systems in SPIN, increase the discriminating power of the available metadata and later help map available knowledge to free-form queries. It will also be fed back to the rest of the tasks using semantic information, including the collaborative tagging system itself (in the form of tagging recommendations for new users). WP3 will also use that information to help further semantic extraction, so the whole process can be considered iterative, and process workflows will ensure that each task reinforces the others.

Task 5.3: Semantic Context Matching for Media Items (TID, M6-24)

Once the knowledge database has been populated with all semantic information related to media content available in the SPIN network, this task will put it to use by computing degrees of similarity and relationships between the contents of that available media. All generated semantics, both automatically created (from WP3) as well as inferred from social annotations (in T5.3) will be used establish relationships at different semantic degrees between content elements in the network. Links will be created not only between media pieces, but also between metadata elements (e.g. how different tags created by users relate to each other).

Note that the context referred to in this task is the media context, that is, how content items relate to each other, and as such is independent from the user context (which is deal with in T4.1) and from the device context (considered in T4.2).

Task 5.4: Distributed Media Linking and Searching (AUT, M12-30)

Once T5.3 has created the semantic contexts between content elements, this task will develop application software interfaces that enable to seamless access media residing in different nodes of the social network, as well as build search modules that enable location of media based on semantic properties. This will enable to navigate across content sets, find related items and create links between media and media pieces that enable the building of intelligent applications, and will be used in WP4 to build the community access portals. Two main modules will be developed for end-users:

- A semantic search engine, with an available query API that can be used to specify semantic queries.
- A browsing engine, which is able to return suitable arrangements of related media elements for navigation across thematic lines.

The task will also develop API interfaces specially adapted for the needs of professional users accessing the SPIN networks, which will incorporate additional capabilities (at the expense of added complexity).

Task 5.5: Relevance feedback and knowledge update (UIBK, M12-33)

This task will put in place an architecture to enable users give easy feedback on the query and navigation results that the system is providing to them. This will be used by the system at two levels:

- To iteratively improve search results of the queries, by signalling user validity information on provided results sets.
- To update the available semantics. Both positive and negative feedback will be used, combined with individual and social profiles of the individuals providing feedback, to help creating shared knowledge and reduce semantic inconsistencies.

WP6 System Architecture and Integration *(STM, M1-36)*

This work package will specify and implement the overall system architecture testbed needed for the actual implementation of the whole system, will perform the integration of all the algorithms, will test that all components are correctly working as single units and as part of the overall system, and the output prototype will be the base for the demonstration activities.

Task 6.1 System requirements and methodology(ATC, M6-12)

This task will specify the platform and methodology that will be used as the base for the development and the integration of the building blocks of the project, including both the final platform for demonstration, and guidelines for all WP about rules to follow to make sure all developments will smoothly integrate and interoperate.

Task 6.2 SPIN architecture and platform (STM, M12-18)

This task will specify how the application will be built and the single entities will interact together. The overall system will be partitioned into sub-systems that will be assembled in parallel, according to technical feasibility, and then merged. This task will also specify and implement all the additional supporting SW building blocks that will be required to run and fully demonstrate the project research output

Task 6.3 Application integration (STM, M6-30)

This task will start from results of the other WPs, from the platform defined in task T1.1, and integrate the single applications to provide the final demonstrator. Integration will require not only the full code model of the application, but the support from the application developers as well in order to guarantee exact deployment in the final system of the components/subsystems. This task will also make sure all additional supporting SW building blocks needed as specified in T6.2 will be made available within the integration platform.

Task 6.4 Software testing and technical validation (STM, M6-36)

This task will firstly define key functional validation areas, validation methodology and verification measurement criteria. According to the defined testing strategy, it will exercise the components to certify full functionality of each one, and it will feedback possible non-conformances to each application work package for correction. Testing will be jointly

performed by the application integrator and the component developer. Testing will be composed of a pre-integration single component testing phase, and a post-integration phase.

WP7 Demonstration *(FEA, M18-36)*

This WP consist of two small yet important tasks targeting demonstration activities designed to showcase specific key modules of SPIN and the final functional system in a realistic test case. The resources allocated to this WP will not be used for technical work or developments related to the system and modules, it will be rather used to prepare the demonstration at logistic level before the actual event, provide logistics during the event and pay for the personal manning the stand where the demonstrations take place. It is expected that at least four different demonstrations will be achieved during the project life.

Task 7.1 Demonstration of components (FEA, M12-30)

Demonstrating the software components will be done under realistic conditions involving normal internet users. Feedback from the users helps to optimize function and usability.

Task 7.2 Demonstration of social media systems (FEA, M24-36)

Real existing internet communities make up the best test case. After demonstrating the components, the system will be integrated in the 50 plus internet community feierabend.com. In direct comparison to the standard search and socializing tools of the community, the advantages of the semantic approach in social media system will be demonstrated.

WP8 Dissemination and Exploitation *(ATC, M1-36)*

Although ATC will lead both the dissemination and exploitation tasks all partners will participate in disseminating the project results form their individual activities and for defining and planning individual exploitation opportunities.

Task 8.1 Dissemination

This task is responsible for dissemination of SPIN to a wide set of "publics". These include potential end customers of future SPIN products and services, potential future industrial collaborators, European Commission officers, other ICT projects in related technologies, researchers and technology developers in academic institutes and industrial research laboratories, and standards groups. Task 8.1 will write a plan for the dissemination and use of knowledge, which will be updated each year, which identifies target groups for information transfer, identifies the key messages for those groups, evaluates the best means of communicating to those targets, and produces and communicates the required information in a timely manner.

Various forums will be used to communicate SPIN outcomes. These include conferences, workshops, journals, web based publishing (e.g. via the SPIN web site which WP8 will maintain), semi-public "kiosks", standards submissions, ICT cluster papers, and small seminars and talks organised for specialised audiences. Task 8.1 will evaluate the success of each communication opportunity, and use this feedback to update the dissemination plan.

SPIN will use the skills, contacts, and experience of all its partners, but especially its academic partners, in reaching technical audiences. Selecting target media from the dissemination plan, SPIN partners will write an appropriate number of conference papers, journal articles, web-based articles, and internal reports such that the knowledge generated in SPIN is disseminated to all our required audiences. Dissemination will commence as soon as

preliminary results are available. When available, results will be presented in international conferences and workshops.

Task 8.2 Exploitation

This WP aims to provide the tools and mechanisms to enable exploitation of SPIN results within members of the consortium as well as creating opportunities for technology licensing to organisations outside the consortium where appropriate.

Task8.2 will work very closely with WP1 in development and ongoing maintenance of an Intellectual Property plan (IP plan). Each WP within SPIN will be assessed periodically (not less than annually) to identify opportunities for generation of patents, and protection of knowledge, such that Intellectual Property within the project as a whole is carefully managed. This will allow exploitation by all partners to be planned well in advance of the project's end date. Consideration will be given to the creation of a patent pool, with defined exploitation and licensing terms commensurate with each partner's contribution to development of knowledge in the project. This task will develop and maintain an exploitation plan. Essential business analysis related to possible SPIN products and services will be carried out including external analysis such as STEP factors (sociological, technological, economic, and political) and competitive analysis, as well as internal analysis such as SWOT factors (strengths, weaknesses, opportunities and threats) and organisational analysis.

Although ATC will lead both the dissemination and exploitation tasks all partners will participate in disseminating the project results form their individual activities and for defining and planning individual exploitation opportunities.

Task 8.3 Training

Training in user evaluation methods will be provided within WP2. Several partners, including SMEs, wish to participate in user evaluation of SPIN technology, or to apply user validation methods in the course of developing components. The training will be tailored to their special needs according to the workplan. Training will be offered by VTT. This training is important as each partner in WP2 has access to a certain set of users, and aggregation of all these users provides essential input into SPIN. The training offered by VTT within WP2 will allow those partners who have very good user relationships, but who do not have the basic skills in human factors needed for user requirements gathering or user evaluations, to make important contributions to SPIN user-centred design and development.

The other part of training within WP2 will focus on methods that are appropriate for the final evaluation. The final evaluation is to assess the user-perceived qualities of the implemented SPIN systems. The results need to be valid for all the different target user groups and hence will involve a larger sample of these user groups. Autonomy and ATC will provide consortium trainees with the necessary skills to set up and conduct appropriate experiments, apply the chosen methods or tools, and to analyse the collected data.

Overall placement of tasks in the SPIN system

Once all tasks of SPIN have been presented, we can revisit the system diagram and map them to specific sections and blocks thereof. The result can be seen in Figure 4.

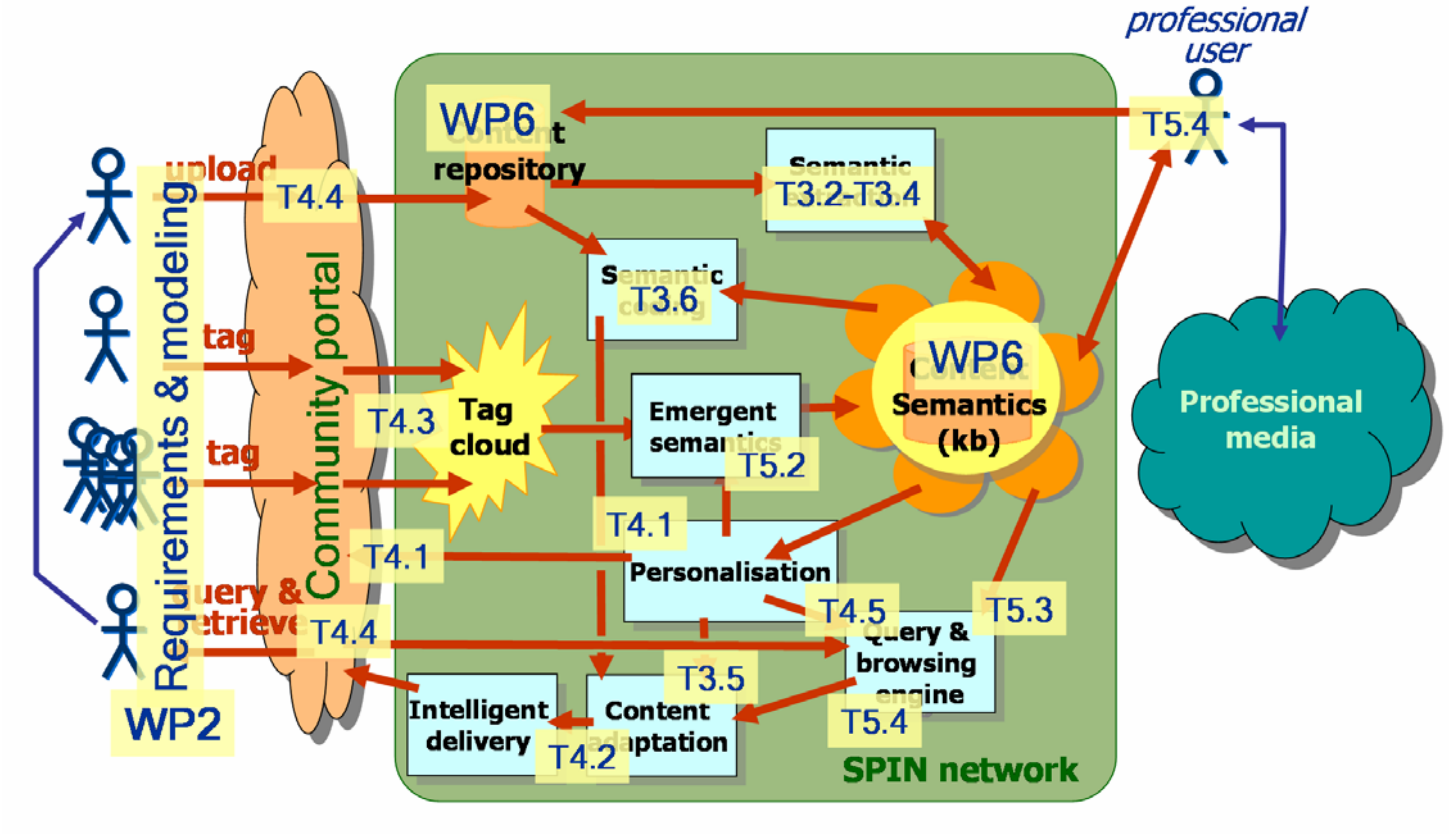


Figure 4: Task placement within the SPIN system

Not all tasks have been placed in the figure, since some of them either refer to specification or general modelling activities, or have more general applicability to the system. Note also that WP6, in addition to its general role of creating the overall system architecture and performing integration, provides also some basic general-purpose blocks such as a knowledge base and a content repository.

Risk Assessment

As identified in the Project Management section, the SPIN risk management plan will be produced on the basis of existing risk management practices and more specifically the Continuous Risk Management (CRM) paradigm developed by the Software Engineering Institute (SEI) of Carnegie Mellon University. The plan will report risk identification, analysis and mitigation strategies for the project. Along these lines, the following table outlines the main risks previewed in the context of the project, their impact on the project and some proposed solutions and mitigation strategy in the time of proposal writing:

Problem/Risk	Actual/Potential Impact on the Project	Risk exposure	Proposed solution / mitigation strategy
Risks stemming from the multidisciplinary nature of partners	Failure to successfully transfer knowledge and experience from business to academia-technology providers and vice versa	Medium	The project management is structured to ensure smooth communication between technology providers, academia and users, monitoring of progress and keep up to date with evolution
Underestimation of the time needed to produce deliverables	Tasks not completed / Deliverables not submitted on time	Medium	To ensure the successful completion of the activities and the validity of their results, each workpackage contains planning of work, validation and quality assurance activities. WP leaders are responsible for timely completion of activities – project and technical management ensure timely submission of deliverables
Underestimation of effort needed to complete activities	Resource / Budget overrun	Medium	Management structured so as to closely monitor resource/budget consumption / take corrective actions wherever necessary
Lack of experience and qualifications of staff involved	Results of low quality	Medium	All partners commit to provide highly trained and skilful resources
Issues related to partners communication	Co-ordination problems	Medium	Communication flow strategy established: main vehicle for information exchange within the project are working papers, project meetings, workshops, telephone conferences, e-mail, project web site
	Disputes among partners	Low	Decision and conflict resolution procedures specified in quality plan and agreed upon
Risks related to technical activities and quality and validity of results	Technical results of low quality / relevance to users and market	Critical	The Technical Committee (TC) chaired by the Technical co-ordinator with participation from all Workpackage leaders review technical and research aspects of the project and control technical activities and directions. This ensures that the project remains focussed on its original commercial and technical objectives. Formal quality plan produced and agreed upon. Results re-evaluated throughout the project in order to ensure their validity with respect to users and market needs.
Technical risks related to shifts in standardization efforts or the appearance of a disruptive technology	Obsolete technical results	Critical	The Technical Committee (TC) reviews technical and research aspects of the project and controls technical activities and directions.

Table 1.3.a: Workpackage List

WP No	Work package title	Type of activity[7]	Lead partic no.	Lead partic.	Staff-months	Start month	End month
WP 1	Project Management	MGT	1	HHI	39	1	36
WP 2	User centredness	RTD	1	HHI	82	1	36
WP 3	Semantic-based multimedia analysis	RTD	4	QMUL	141	1	36
WP 4	Prosumer Communities	RTD	2	VTT	161	1	36
WP 5	Semantics in Social Media	RTD	3	TID	168	1	33
WP 6	System Architecture and Integration	RTD	9	STM	170	6	36
WP 7	Demonstration	DEM	12	FEA	16	18	36
WP 8	Dissemination and Exploitation	OTHER	8	ATC	54	1	36
	TOTAL				831		

[7] RTD = Research and technological development; DEM = Demonstration; MGT = Management of the consortium; OTHER = Other specific activities.

Table 1.3.b: List of Deliverables

Del. No.	Deliverable name	WP No.	Nature[8]	Diss. level[9]	Delivery date
D1.1.x	Two monthly management reports	1	R	CO	M2, M4, …, M36
D8.1	Web site	8	O	PU	M3
D2.5	Preliminary report on SPIN technology user requirements	2	R	CO	M4
D1.2.x	Six monthly progress reports	1	R	CO	M6, M12, …,M30
D1.7.x	Six monthly quality assurance reports	1	R	CO	M6, M12, …,M30
D2.6	Preliminary report on SPIN user interface requirements	2	R	PP	M6
D6.1	Technical report on system architecture and integration methodology	6	R	CO	M6
D8.2	Dissemination material	8	O	PU	M6
D8.3	First Dissemination plan	8	R	PU	M6
D2.3	Report on Tagging and user intentions	2	R	PP	M8
D4.1	Specification of metadata for user profiles	4	R	PP	M8
D1.3.x	Yearly progress reports	1	R	CO	M12, M24, M36
D1.6.x	Yearly financial reports	1	R	CO	M12, M24, M36
D2.1	Initial report on social media: market and technology	2	R	PP	M12
D3.1	Specification of the metadata modelling and metadata extraction subsystem	3	R	CO	M12
D3.3	Specification of multimodal modelling and content characterization	3	R	PP	M12
D4.2	Initial social profile manager with community features	4	O	CO	M12
D4.3	Specification of media adaptation and delivery platform	4	R	CO	M12
D5.1	Social tagging analysis and model	5	R	CO	M12
D5.2	Initial specification of ontology for SPIN's media objects	5	R	CO	M12
D5.5	Specification semantic context software infrastructure	5	R	CO	M16
D5.6	Specification of first semantic extraction and linking engine from tagging and analysis	5	R	CO	M16
D2.4	Report on psychological analysis of prosumer descriptions	2	R	PP	M18
D3.7	Specification of the prototype for	3	R	CO	M18

[8] Codes for nature of deliverable: **R** = Report, **P** = Prototype, **D** = Demonstrator, **O** = Other

[9] Codes for dissemination level: **PU** = Public; **PP** = Restricted to other programme participants; **RE** = Restricted to a group specified by the consortium; **CO** = Confidential, only for members of the consortium.

	perception-based media summarization				
D4.4	Report on contagious tagging infrastructure	4	R	CO	M18
D5.7	Final specification of semantic extraction & linking engine including relevance feedback	5	R	CO	M18
D6.2	Technical report on software architecture and application specification	6	R	CO	M18
D6.3	Software demonstrator: intermediate version	6	D	PU	M18
D8.6	First Exploitation plan	8	R	CO	M18
D2.7	Initial report on user acceptance of SPIN-components	2	R	PU	M24
D3.2	Report on AV semantic timeline representations	3	R	CO	M24
D3.5	Report on categorization and management of semantic content	3	R	CO	M24
D4.5	Specification of media query and navigation tools	4	R	CO	M24
D5.3	Report on testing and validation of ontology management environment	5	R	CO	M24
D6.4	Specification of final SPIN system prototype	6	R	CO	M24
D8.4	Final Dissemination plan	8	R	PU	M24
D3.4	Report on learning and reasoning techniques implemented in SPIN	3	R	CO	M30
D4.6	Report on models and protocols for managing trust, privacy and copyright issues	4	R	PP	M30
D5.4	Final report on SPIN's semantic social network annotations	5	R	CO	M30
D8.7	Final Exploitation plan	8	R	CO	M30
D5.8	Report on testing of SPIN's relevance feedback and knowledge update	5	R	CO	M33
D1.4	Public final report	1	R	PU	M36
D1.5	Private final report	1	R	CO	M36
D2.2	Final report on social media: market and technology	2	R	CO	M36
D2.8	Final report on user acceptance and field trials	2	R	PU	M36
D3.6	Report on SPIN techniques for semantic structuring and content characterization	3	R	CO	M36
D6.5	Technical report on validation results	6	R	PU	M36
D8.5	Dissemination report	8	R	PU	M36
D8.8	SPIN Exploitation report	8	R	PU	M36
D8.9	Training activities report	8	R	PU	M36

Table 1.3.c: Workpackage Descriptions

RTD Activities

The following five tables contain the description of all RTD WPs in the project. For each one a brief description of objectives is given, followed by a decomposition of the work in terms of tasks. Each task description contains the task name, timing, participating partners (the task leader is marked in bold and with an asterisk), a short description and a list of activities that each task contains (for each activity also the time frame and participating partners are given). The final part is a list of deliverables and milestones for the work package; for each one the time of delivery and main responsible partner[10] is given.

Work package number	2	**Start date or starting event:**			M1						
Work package title	**User Centredness**										
Activity type	RTD										
Participant number	1	2	3	4	5	6	7	8	9	10	11	12
Participant short name	**HHI**	VTT	TID	QMUL	AUT	UIBK	CWI	ATC	STM	EFE	GIC	FEA
Person-months per participant	28	20	0	0	3	0	0	6	3	8	4	10

Objectives

- To determine user needs and requirements for semantic people-information networks
- To study factors that affect user acceptance of semantic people-information networks, including usability, perceived value, trust, and ease of adoption

Description of work

Task 2.1: Market and technology analysis, *M1-36 (ATC*, AUT, ATN, STM, EFE)*

This task will provide a survey of the existing trends and solutions for social media, compare their features, and identify potential user needs. The results will be used to create questionnaire items and discussion topics for the requirements process and also to assist in the development of exploitation strategies. T2.1 includes these activities:

- Current multimedia content management technology (M1-3, ATC)
- Current multimedia search technology (M1-3, ATN)
- Current multimedia streaming technology (M1-3, STM)
- Current multimedia sharing technology (M1-3, EFE)

Task 2.2: Psychological analysis of user generated content descriptions, *M1-18 (HHI*, VTT)*

In this task the influence of user intentions for content sharing on annotations and their consequences for later retrieval will be studied. Sharing content has a pragmatic meaning, i.e. users want to inform or amuse others, to express themselves and so on. Those intentions are likely to influence the tagging process. T2.2 includes the following activities:

[10] There may be other partners contributing to the deliverable or milestone; the table contains the name of the partner in charge of coordinating its production.

- Online interviews on user strategies during annotation and search (M1-8, VTT)
- Laboratory experiments on user strategies during annotation and search (M1-8, HHI)

Task 2.3: User requirements and human factors in SPIN technology, *M1-18 (HHI*, VTT, EFE, GIC, FEA)*

In this task the system features requested by different stakeholders will be investigated. The requirements process starts with defining a set of usage scenarios in cooperation with users, technology developers and service providers in the Open Web Lab (Owela). The scenarios will be analyzed further into use cases, which can be directly utilized in the technical work packages. From those use cases the required system features will be derived. T2.3 consists of the following activities:

- Stakeholder analysis and usage scenarios (M1-2, EFE, GIC, FEA)
- Description of use cases (M2-4, VTT)
- Derivation of requirements from use cases (M5-18, HHI)

Task 2.4: User-centred requirements for SPIN interfaces, *M6-M18 (VTT*, HHI, EFE, FEA)*

In this task the special requirements for an optimal interaction with the social media system, with the media itself, or with other users will be captured. It is anticipated that those requirements can only to a limited extent be directly inquired from the users. Therefore some part of the work will consist in inferring possible requirements, e.g. for presenting alternative choices for relevance feedback, from cognitive hypotheses, and by discussing those with the users. The following activities will occur in T2.4:

- Cognitive hypotheses on optimal interface design (M6, HHI)
- Creation of possible design schemes and mock-ups (M8-9, VTT)
- Requirements discussion groups (M10-13, EFE, FEA)
- Data analysis (M14-18, VTT)

Task 2.5: Usability validation, *M20-36 (VTT*, HHI, FEA, EFE, GIC)*

In this task the usability of the individual components will be evaluated in the laboratory employing the use cases derived in T2.3, and towards the end of the project a field trial for the whole social media system will take place. In the field trial the conductors and the users will also communicate through social media, again using VTT's Open Web Lab (Owela) as a tool in user evaluations. T2.5 includes the following activities:

- SPIN component usability tests (M20-30, HHI, EFE, GIC)
- SPIN field trial (M31-35, VTT, FEA)

List of deliverables

D2.1 (M12, ATC) – Initial report on social media: market and technology

D2.2 (M36, ATC) – Final report on social media: market and technology

D2.3 (M8, HHI) – Report on Tagging and user intentions

D2.4 (M18, HHI) – Report on psychological analysis of prosumer descriptions

D2.5 (M4, HHI) – Preliminary report on SPIN technology user requirements

D2.6 (M6, VTT) – Preliminary report on SPIN user interface requirements

D2.7 (M24, VTT) – Initial report on user acceptance of SPIN-components

D2.8 (M36, VTT) – Final report on user acceptance and field trials

List of milestones

MS2.1 (M36, ATC) – SPIN long term market perspectives
MS2.2 (M4, HHI) – Scenarios and use cases
MS2.3 (M18, HHI) – SPIN technology user requirements
MS2.4 (M18, VTT) – SPIN user interface requirements
MS2.5 (M24, HHI) – Initial analysis on acceptance of SPIN-components
MS2.6 (M32, VTT) – Final analysis of user acceptance of SPIN-components
MS2.7 (M36, VTT) – Results of the field trials

Work package number	3	**Start date or starting event:**			M1						
Work package title	**Semantic Structuring and Characterization**										
Activity type	RTD										
Participant number	1	2	3	4	5	6	7	8	9	10	11	12
Participant short name	HHI	VTT	TID	**QMUL**	AUT	UIBK	CWI	ATC	STM	EFE	GIC	FEA
Person-months per participant	18	0	15	60	6	0	12	0	0	16	8	6

Objectives

- To specify syntax and semantics for metadata structuring that will support the necessary functionalities and interoperability in the project
- To develop approaches for content exploration and extraction of low-level metadata in multi feature spaces
- To develop technologies for precise temporal modelling of video content and shot characterization based on mid-level features taking into account the specific content nature.
- To develop suitable approaches to semantic context aware analysis and inference through available metadata
- To develop an approach for effective semantic coding

Description of work

This WP develops technologies for metadata structuring, metadata extraction in a multi feature space, devising a metric in a multi-feature space operating on content structures. It also provides approaches for development of abstract time-line semantic models and shot characterisation. Furthermore, semantic context aware analysis, event detection and video summarisation are used for management of semantic content.

Task 3.1: Metadata structuring analysis and interoperability, *M1-M18 (**EFE***, *TID, GIC, FEA)*

This task will specify syntax and semantics for metadata structuring that will support interoperability and functionality needed for the project. The metadata structure will include low- and mid-level media descriptors for searching and characterization, as well as high- level metadata and semantic tags for knowledge-based processing. Activities in this task are:

- Specifying syntax and semantics for metadata structuring (M1-M10, EFE)
- Studying multimodal techniques (M1-M15, GIC)
- Revealing the structure of content to infer semantic information (M6-M18, TID)
- Ensuring interoperability relations among semantic metadata of different granularity (M6-M18, FEA)

Task 3.2: AV semantic timeline representations, *M1-M30 (**QMUL***, *HHI, TID)*

This task will deal with development of abstract time-line semantic models for audio-visual content. Different annotation modalities will be combined in a timeline representation using a number of audio, motion and visual features. Activities in this task are:

- Development of abstract time-line semantic models for audio-visual content (M6-M24,

TID)

- Enabling multimedia synchronization (M6-M18, QMUL)
- Developing approaches for representation and evolution of events in time (M6-M24, HHI)

Task 3.3: Multimodal modelling and content characterization, *M1-M30 (**HHI***, *TID, QMUL)*

Temporal analysis of audio-visual content will be investigated and raw non-edited shots will be dynamically modelled in multi-feature space for high-level characterization and recognition. A suitable classification scheme for mood and emotion estimation will be designed for efficient shot characterization. Further it will be explored how shots with strongly varying and diverse audio-visual content can be efficiently represented by multi-feature sets derived from sub-shots.

Activities in this task are:

- Temporal analysis of audio-visual content on raw non-edited shots (M6-M24, TID)
- Development of advanced models for representing types of emotions and moods (M10-M24, QMUL)
- Shot characterisation based on emotion, moods, and strong variation in audio-visual content (M12-M30, HHI)

Task 3.4: Learning and reasoning in feature space, *M6-M30 (**QMUL***, *CWI*)

This task will derive semantic using automatic classification based on content structured metadata for audio-visual content. This knowledge will be extracted through classification of identified content, using novel processing algorithms based upon multi-modal analysis. This task will also define a number of reasoning approaches to develop an efficient fused reasoner that will enable efficient reasoning over knowledge databases. Activities in this task are:

- Modelling semantic and automatic classification (M12-M24, QMUL)
- Cross-referencing of classification and learning results (M12-M24, QMUL)
- Definition of combined reasoners over the available metadata for knowledge management (M12-M24, CWI)
- Development of rules for semantic coherency across different data (M12-M24, CWI)

Task 3.5: Categorization and management of semantic content, *M12-M36 (**QMUL***, *AUT*, *EFE*)

This task will derive semantic and automatic annotation based on modelled metadata for audio-visual content. Technologies for semantic inference and classification will be developed for identification of scenes or semantically common situations. Video summarisation will take advantage of the low-level features and indexes extracted in previous tasks, as well as results from classifiers and inference models. Activities in this task are:

- Detecting and interpreting high level events and automatic semantic annotation (M12-M30, AUT)
- Developing context sentient reasoning rules (M12-M24, EFE)
- Generating video summaries based on outputs of T3.1-T3.4 (M12-M36, QMUL)

Task 3.6: Perception-based media summarization and coding, *M1-M36 (**QMUL***, *CWI*)

This task is focused on coding of images based on the semantic importance of its content as well as video coding based on the perceptual relevance of the video content. Activities in this

task are:

- Developing methods for detecting regions of interest with high semantic importance in images (M10-M18, CWI)
- Devising perceptual relevance metrics for audiovisual content (M12-M20, QMUL)
- Integrating semantic relevance into a new family of scalable coding techniques (M22-M36, CWI)

List of Deliverables

D3.1 (M12, EFE) – Specification of the metadata modelling and metadata extraction subsystem

D3.2 (M24, QMUL) – Report on AV semantic timeline representations

D3.3 (M12, HHI) – Specification of multimodal modelling and content characterization

D3.4 (M30, QMUL) – Report on learning and reasoning techniques implemented in SPIN

D3.5 (M24, QMUL) – Report on categorization and management of semantic content

D3.6 (M36, QMUL) – Report on SPIN techniques for semantic structuring and content characterization

D3.7 (M18, QMUL) – Specification of the prototype for perception-based media summarization

List of Milestones

MS3.1 (M18, EFE) – Fully functional module for metadata modelling and extraction

MS3.2 (M18, QMUL) – Initial module for AV semantic timeline representations

MS3.3 (M30, QMUL) – Final module for AV semantic timeline representations

MS3.4 (M18, HHI) – Initial module for multimodal modelling and content characterization

MS3.5 (M30, HHI) – Final module for multimodal modelling and content characterization

MS3.6 (M24, QMUL) – Initial prototype for learning and reasoning on semantic metadata

MS3.7 (M24, QMUL) – Initial version of perception-based coder

MS3.8 (M36, QMUL) – Fully functional perception-based coder

Work package number	4	**Start date or starting event:**			M1						
Work package title	**Prosumer Communities**										
Activity type	RTD										
Participant number	1	2	3	4	5	6	7	8	9	10	11	12
Participant short name	HHI	**VTT**	TID	QMUL	AUT	UIBK	CWI	ATC	STM	EFE	GIC	FEA
Person-months per participant	8	32	20	8	0	26	30	5	10	12	4	6

Objectives

- To develop a personalisation infrastructure capable of modifying the behaviour of the SPIN system
- To provide users with adapted versions of content
- To develop interfaces and modules for content and annotation creation, management and retrieval
- To include confidence levels and privacy-preserving information management about metadata

Description of work

Task 4.1: Multi-level personalization and building of social profiles, *M1-24 (**VTT***, TID, FEA, UIBK)*

With different sources and annotations available, personalisation is required to let people access or utilise only the annotations that they feel relevant. Users need different profiles in different services but it will be beneficial to be able to re-use profile elements when appropriate. Social profiles help other people in assessing the producer of the annotations. This task will develop concepts and tools for personalisation and building of social profiles. Activities are:

- User and group profile definition (M1-8, VTT, FEA)
- Profile acquisition and management (M6-12, VTT)
- Automatic profile update (M12-18, UIBK, TID)

Task 4.2: Intelligent content adaptation and delivery, *M6-30 (**STM***, QMUL, CWI, EFE)*

This task is in charge of providing users with the desired media material, adapted to their user's abilities and preferences (physical and perceptual), the device and the environment where the perception of the media takes place. This includes selecting preferred modalities for the user and displayable by the user's device. Activities in the task include:

- Device and environment descriptions and profiles (M6-M12, CWI, EFE)
- Semantics-based media adaptation (M8-M30, QMUL)
- Media propagation and delivery (M8-M24, STM)

Task 4.3: Collaborative multimedia metadata tagging modules, *M1-36 (**CWI*,** VTT, EFE, UIBK)*

This task will develop social media tools with which the users can attach annotations to existing content, looking for concepts with which the users can collaborate as a community, enriching information together rather than acting just as individuals. Content can be annotated

as a whole or through temporal/spatial decompositions, tags can be visualised and managed according to different levels of preferences and relevant tags will also be suggested to users based on this information and underlying ontologies. Activities include:

- Use case specification for contagious tagging (M1-6, VTT)
- Free-form tagging subsystem for content and content segments (M7-24, CWI, VTT)
- Semantic inferences for tag recommendations (M12-M36, UIBK, EFE)

Task 4.4: Interfaces and tools for media query, navigation and creation, *M6-30 (**CWI***, *HHI, VTT, TID)*

Users can commit content to a repository and add their own descriptive tags (annotations). Once the content and associated annotations are there, they can be explored by others. This requires one or more systems for committing content plus the associated annotations. The task activities are:

- Web-based interface engine for query and navigation (M6-12, CWI)
- Query input, query mapping and sorting and layout of results (M12-24, HHI, CWI)
- Personalised navigation and clustering (M12-24, VTT, TID)

Task 4.5: Trust, privacy and copyrights in social media, *M6-30 (**VTT***, *TID, ATC, UIBK)*

This task will manage metadata representations of information associated to user content and annotations. It will include confidence levels for annotations, as well as rights information for content elements in the SPIN network. Usage tracking modules will ensure that privacy and anonymity preferences from users are respected.

- Usage tracking system and privacy enforcement (M6-18, VTT)
- Content and metadata rights management (M12-M30, ATC)
- Trust levels for annotations and users (M12-24, TID, UIBK)

List of Deliverables

D4.1 (M8, VTT) – Specification of metadata for user profiles

D4.2 (M12, VTT) – Initial social profile manager with community features

D4.3 (M12, STM) – Specification of media adaptation and delivery platform

D4.4 (M18, CWI) – Report on contagious tagging infrastructure

D4.5 (M24, CWI) – Specification of media query and navigation tools

D4.6 (M30, VTT) – Report on models and protocols for managing trust, privacy and copyright issues

List of Milestones

MS4.1 (M18, VTT) – Profile acquisition and update

MS4.2 (M24, VTT) – Fully functional social profile manager with community features

MS4.3 (M18, STM) – Initial media delivery module

MS4.4 (M30, STM) – Fully functional module for media adaptation

MS4.5 (M16, CWI) – Initial contagious tagging infrastructure

MS4.6 (M36, CWI) – Fully functional module for contagious tagging

MS4.7 (M12, CWI) – Initial user interface engine

MS4.8 (M30, CWI) – Fully functional user interface engine

Work package number	5	**Start date or starting event:**			M1						
Work package title	**Semantics in Social Networks**										
Activity type	RTD										
Participant number	1	2	3	4	5	6	7	8	9	10	11	12
Participant short name	HHI	VTT	**TID**	QMUL	AUT	UIBK	CWI	ATC	STM	EFE	GIC	FEA
Person-months per participant	6	6	42	8	12	34	24	4	0	18	10	4

Objectives

- To model the process of social tagging
- To create an architecture for building individual and collective profiles and thus offer a personalized user experience
- To enable collective annotation of content elements and improve available semantics through social knowledge
- To build the community-based system for locating content and sharing it for visualizing or reusing
- To use user feedback to help update metadata and improve system behaviour

Description of work

Task 5.1: Style, culture and ontologies, *M1-24 (**UIBK***, *CWI, VTT, ATC, FEA)*

This task will perform a formal modelling of the process of interacting with social media, especially including tagging and annotation of content. It will use user contexts (developed by WP2) and metadata models (developed in WP3). The outcome will be metadata knowledge structures to be populated and used in the rest of WP5.

Activities in this task are:

- Specification of use cases for tagging contexts (FEA, M2-4)
- Context characterization (VTT, CWI, M4-7)
- Ontology structures for tagging contexts (UIBK, ATC, M8-10)

Task 5.2: Emergent semantics from collective annotations, *M6-30 (**TID***,*UIBK, CWI, EFE)*

This task will enable collective annotation of content by using a distributed environment using community-produced tags. Adequate inferencing rules will be created to allow fruitful interaction between the unstructured tags provided by the community and the more formal semantics contained in the metadata models (as and the automatic categorization produced in WP3. The results will increase the discriminating power of the available metadata and later help map available knowledge to free-form queries. T5.2 includes these activities:

- Trainable models for tag mapping (M6-18, TID)
- Reasoning rules for semantic expansion (M12-30, TID, CWI, UIBK)
- User and context-based tag confidence measures (M18-30, TID, EFE)

Task 5.3: Semantic Context Matching for Media Items, *M6-24 (**TID***, *CWI, EFE, GIC)*

The role of this task is to use all generated semantics, both automatically created (from WP3)

as well as inferred from social annotations (in T5.2) to be able to establish relationships at different semantic degrees between content elements in the network. This will enable to navigate across content sets, find related items and create links between media and media pieces that enable the building of intelligent applications. Activities include:

- Context infrastructure (M6-M10, TID)
- Media contexts based on semantic information about content (M10-M16, CWI, EFE, GIC)
- User-based dynamic contexts (M16-M24, TID, CWI)

Task 5.4: Distributed Media Linking and Searching, *M12-M30 (**AUT***, *TID, EFE, GIC)*

Once the links between content elements have been created in T5.3, this task will develop application interfaces that enable to seamless access media residing in different nodes of the social network, as well as build search modules that enable location of media based on semantic properties. T5.4 includes these activities:

- Semantic search engine (M12-M24, AUT)
- Browsing engine for content navigation (M18-M30, TID)
- Access engine for professional users (M12-M20, EFE, GIC)

Task 5.5: Relevance feedback and knowledge update, *M12-33 (**UIBK***, *TID, QMUL, HHI)*

Search results for media content can be iteratively improved through relevance feedback. This task will use this feedback not only for narrowing search results, but also for updating the available semantics. Both positive and negative feedback will be used, combined with individual and social profiles, to help creating shared knowledge and reduce semantic inconsistencies.

- Search improvement through relevance feedback (M12-M20, QMUL)
- Tag validation by community users (M16-M24, HHI)
- Retraining of semantic models and rules based on feedback (M20-M30, UIBK, TID)

List of deliverables

D5.1 (M12, CWI) – Social tagging analysis and model

D5.2 (M12, UIBK) – Initial specification of ontology for SPIN's media objects

D5.3 (M24, UIBK) – Report on testing and validation of ontology management environment

D5.4 (M30, TID) – Final report on SPIN's semantic social network annotations

D5.5 (M16, TID) – Specification semantic context software infrastructure

D5.6 (M16, AUT) – Specification of first semantic extraction and linking engine from tagging and analysis

D5.7 (M18, UIBK) – Final specification of semantic extraction & linking engine including relevance feedback

D5.8 (M33, QMUL) – Report on testing of SPIN's relevance feedback and knowledge update

List of milestones

MS5.1 (M24, UIBK) Ontology management environment fully functional
MS5.2 (M8, FEA) – User contexts in social annotations
MS5.3 (M30, TID) – Final semantic social network module
MS5.4 (M12, TID) – Initial model for semantic extraction
MS5.5 (M24, TID) – Semantic context software infrastructure
MS5.6 (M16, AUT) – Early search engine for social media
MS5.7 (M18, TID) – Early navigation engine for social media
MS5.8 (M30, EFE) – Professional access engine for social media
MS5.9 (M30, QMUL) – Fully functional module for relevance feedback in semantic search

Work package number	6		**Start date or starting event:**		M6						
Work package title	**System Architecture and Integration**											
Activity type	RTD											
Participant number	1	2	3	4	5	6	7	8	9	10	11	12
Participant short name	HHI	VTT	TID	QMUL	AUT	UIBK	CWI	ATC	**STM**	EFE	GIC	FEA
Person-months per participant	14	10	6	8	12	6	6	40	44	6	12	6

Objectives

To provide a system architecture proposal and implementation to integrate, exercise and validate together the research results of the project

Description of work

T6.1 System requirements and methodology, *M6-12 (**ATC***, STM, HHI)*

This task will specify the platform and methodology that will be used as the base for the development and the integration of the building block of the project, in particular:

- Platform capabilities specifications (M1-M6, ATC, STM)
- Development guidelines for all WP (M1-M6, ATC, STM, HHI)

T6.2 SPIN architecture and platform, *M12-18 (**STM***, VTT, QMUL, AUT, ATC)*

This task will specify how the application will be built and the single entities will interact together, as well as developing any other functional block needed for the platform; in particular:

- System partitioning in sub-systems to be assembled in parallel (M1-M6, STM)
- Specification and implementation of the additional supporting blocks (M1-M18, STM, VTT, QMUL, AUT, ATC)

T6.3 Application integration, *M6-30 (**STM***, all partners)*

This task will start from results from other WPs, from the platform defined in task T6.1, the supporting blocks defined in T6.2 and integrate the single applications to provide the final demonstrator.

- Full SW model provision (M6-30, all partners)
- Integration (STM, M12-M30)

T6.4 Software testing and technical validation, *M6-36 (**STM***, ATC, all partners)*

This task will define validation methodology, verification measurement criteria it will exercise the applications integrated in the platform to certify full functionality and it will feed back possible non-conformances. Testing will be jointly performed by the application integrator and the component developer.

- Define key functional validation areas, methodology and measurement criteria. (STM, component developers, M6-M9)
- Pre-integration single component testing phase (STM, ATC, component developers, Mx as WP schedule)

- Post-integration phase (STM, ATC, component developers, end M36)

List of deliverables

D6.1 (M6, ATC) – Technical report on system architecture and integration methodology
D6.2 (M18, STM) – Technical report on software architecture and application specification
D6.3 (M18, STM) – Software demonstrator: intermediate version
D6.4 (M24, STM) – Specification of final SPIN system prototype
D6.5 (M36, ATC) – Technical report on validation results

List of milestones

MS6.1 (M12, STM) – Report on validation area, methodology and measurement criteria
MS6.2 (M18, STM) – SPIN software base platform
MS6.3 (M30, ATC) – Validation of intermediate SPIN system
MS6.4 (M36, STM) – Final SPIN system

DEMO Activities

Work package number	7		**Start date or starting event:**		M18						
Work package title	**Demonstration**											
Activity type	DEM											
Participant number	1	2	3	4	5	6	7	8	9	10	11	12
Participant short name	HHI	VTT	TID	QMUL	AUT	UIBK	CWI	ATC	STM	EFE	GIC	**FEA**
Person-months per participant	2	0	1	0	0	0	0	4	0	2	0	7

Objectives

- To carry out partial demonstrations of developed components
- To demonstrate the results of the development in a real life application

Description of work

Task 7.1: Demonstration of components, *M12-30 (**FEA*,** QMUL, HHI, VTT, TID, ATC)*

Demonstration of the components will show up the power of semantic coding and its wide range of applications. The components to be demonstrated include the semantic coding engine, the generation of ontologies from user tags and automated generation of descriptors for multimedia content. Therefore text and multimedia content, provided by multimedia agencies and internet communities will be analyzed by the software and the results will be compared directly with existing manual coding of the content. The demonstrators for the components will be done under realistic conditions involving normal internet users.

Task 7.2: Demonstration of social media systems, *M24-36 (**FEA*,** QMUL, HHI, VTT, TID, ATC)*

Once the software components are proven and demonstrated, the system will be integrated in a real existing internet community. In direct comparison to the standard search and socializing tools of the community, the advantages of the semantic approach in social media system will be demonstrated. Feedback from the community members helps to optimize function and usability.

List of milestones

MS7.1 (M18[11], M24, M30, FEA) Demonstrations of single SPIN modules

MS7.2 (M30[11], FEA) Running social media system demonstrator

MS7.3 (M36[11], HHI) Final demonstration of the SPIN social media system

[11] Dates are indicative since they will be moved to time up with relevant fairs, exhibitions and project reviews

OTHER Activities

Work package number	8	**Start date or starting event:**				M1					
Work package title	**Dissemination and Exploitation**										
Activity type	OTHERS										
Participant number	1	2	3	4	5	6	7	8	9	10	11	
Participant short name	HHI	VTT	TID	QMUL	AUT	UIBK	CWI	**ATC**	STM	EFE	GIC	FEA
Person-months per participant	3	4	2	2	7	4	4	15	4	3	2	4

Objectives

- To plan and co-ordinate publicity, publication and dissemination activities
- To continuously disseminate project results
- To monitor related and relevant market developments
- To design and execute a suitable exploitation plan
- To interact continuously with related standardisation bodies
- To seek opportunities to exploit both the component parts of SPIN and the system as a whole
- To define a clear commercial exploitation strategy for the project outcomes
- To prepare their commercial exploitation beyond the end of the project

Description of work

T8.1 Dissemination activities, *M1-36 (**ATC***, *HHI, VTT, TID, QMUL, AUT, UIBK, CWI STM, EFE, GIC, FEA)*

This task will involve activities related to formulating a concrete dissemination strategy for the project, setting up of the project web site, production of related material and participation to events. Dissemination activities will involve:

- Setting up and maintaining the project web site, (M1-36 ATC)
- Preparing and updating the SPIN dissemination material (M1-36, ATC)
- Planning and coordinating participation in scientific events (M1-36, HHI)
- Planning and coordinating participation in commercial events (M1-36, AUT)
- Participation in scientific and commercial events (M1-36, ATC, HHI, VTT, TID, QMUL, AUT, UIBK, CWI STM, EFE, GIC, FEA)

T8.2 Exploitation activities, *M1-36 (**ATC***, *HHI, TID, AUT, UIBK, CWI, STM, EFE, GIC, FEA)*

This task will address issues related to the exploitation of project results. The new products that can potentially arise form the project results will be identified and viable routes to market them will be planned in relation to the relevant business environment. In this context the relevant targeted markets will be identified and modelled along with the current and potential future competitors.

- Identifying business opportunities and drawing the SPIN exploitation plan (M10-36, ATC)

- Identifying and drawing individual or joint partner exploitation plans (M10-36, ATC, HHI, TID, AUT, UIBK, CWI, STM, EFE, GIC, FEA)

T8.3 Training activities, *M12-36 (**ATC***, *AUT, VTT)*

This task will cater for the preparation and deployment of all training activities. This will involve:

- Planning and coordination of training activities (M12-36, ATC)
- Preparation of training material (M15-30, VTT, ATC)
- Organisation of training events and workshops (M24-36, AUT, ATC)

List of deliverables

D8.1 (M3, ATC) – Web site

D8.2 (M6, ATC) – Dissemination material

D8.3 (M6, ATC) – First Dissemination plan

D8.4 (M24, ATC) – Final Dissemination plan

D8.5 (M36, ATC) – Dissemination report

D8.6 (M18, ATC) – First Exploitation plan

D8.7 (M30, ATC) – Final Exploitation plan

D8.8 (M36, ATC) – SPIN exploitation report

D8.9 (M36, ATC) – Training activities report

List of milestones

M8.1 (M6, ATC) – Dissemination material ready and web site operational

M8.3 (M24, ATC) – Analysis of potential technology transfer

M8.5 (M18, VTT) – Completion of training in user evaluation methods

MANAGEMENT Activities

Work package number	1	**Start date or starting event:**			M1						
Work package title	**Project Management**										
Activity type	MGT										
Participant number	1	2	3	4	5	6	7	8	9	10	11	12
Participant short name	**HHI**	VTT	TID	QMUL	AUT	UIBK	CWI	ATC	STM	EFE	GIC	FEA
Person-months per participant	39											

Objectives:

- To manage the overall operation of the project including technical, administrative and financial aspects
- To represent the project actively in relevant events;
- To target liaisons with other projects with which a close association can be beneficial;
- To handle all financial and legal issues;
- To the progress on the project on a regular basis;
- To execute quality control end devise a suitable contingency plan to deal with project associated risks.

Description of work

Task 1.1 Project administration *M1-36 (**HHI***, *all partners)*

This task is aimed at the co-ordination of all operational aspects of the project including technical, administrative and financial aspects. The Co-ordinating Partner will lead this WP and will appoint a person from their organisation to be the Project Coordinator. A management structure will be established according to he description in B2.1. The project will be reviewed every six-months on basis of due deliverables during the reporting period. This task will also provide regular information to the EU Commission about the project progress. The Co-ordinating Partner will operate a regular reporting scheme (collecting achievements, financial expenditures, and notification of problems), collating and sending the information to the EC within an agreed timeframe: two monthly periodic management reports; six monthly periodic progress reports and yearly cost statements.

T1.2 Financial and legal issues *M1-36 (HHI*, *all partners**)***

Initially the project coordinator will write a detailed financial plan based on the initial financial analysis of the project. This plan will be used to review the financial status of the project on a regular basis, and used to generate reports to the project Supervisory Board the Commission. The Coordinator will handle efficiently the distribution of contracts, advance payments and cost claims and will organise the production of a Consortium Agreement. The consortium agreement should be signed before project begin. SPIN partners will be legally bound by the Consortium Agreement, as set and signed during the project preparation. All legal issues will be managed by the legal department of HHI, which has a wide experience in matters concerning international agreements between organisations, relationships between institutions and intellectual property issues.

T1.3 Quality control and project assessment *M1-36 (HHI*, all partners)*

In this task the mechanisms for quality control and assurance will be defined. A Quality Assurance Committee (QAC) will be set at the beginning of the project. Project progress will be evaluated against the work plan and recommendations of the QAC on a regular basis. A contingency plan will be

developed and executed when needed.

List of deliverables

D1.1.x (M2, M4, …,M30, HHI) – Two monthly management reports

D1.2.x (M6, M12, …,M30, HHI) – Six monthly progress reports

D1.3.x (M6, M12, …,M30, HHI) – Six monthly quality assurance reports

D1.4.x (M12, M24, M30, HHI) –Yearly financial reports

D1.5.x (M12, M24, M30, HHI) – Yearly progress reports

D1.6 (M30, HHI) – Public final report

D1.7 (M30, HHI) – Private final report

List of milestones

MS1.1 (M12, HHI) **–** Successful completion of first project review and achievement of all technical objectives and milestones set for the first year

MS1.2 (M24, HHI) **–** Successful completion of second project review and achievement of all technical objectives and milestones set for the first year

MS1.3 (M30, HHI) – Successful completion final project review and achievement of all technical objectives and milestones set in the project

Table 1.3.d: Summary of Staff Effort

The following table details the staff effort for the whole duration of the project, segmented by partner and by work package. For each workpackage the leader is identified by showing the relevant person-month figure in bold.

Partic. no.	Partic. short name	WP1	WP2	WP3	WP4	WP5	WP6	WP7	WP8	Total staff months
1	HHI	**39**	**28**	18	8	6	14	2	3	118
2	VTT	0	20	0	**32**	6	10	0	4	72
3	TID	0	0	15	20	**42**	6	1	2	86
4	QMUL	0	0	**60**	8	8	8	0	2	86
5	AUT	0	3	6	0	12	12	0	7	40
6	UIBK	0	0	0	26	34	6	0	4	70
7	CWI	0	0	12	30	24	6	0	4	76
8	ATC	0	6	0	5	4	40	4	**15**	74
9	STM	0	3	0	10	0	**44**	0	4	61
10	EFE	0	8	16	12	18	6	2	3	65
11	GIC	0	4	8	4	10	12	0	2	40
12	FEA	0	10	6	6	4	6	**7**	4	43
Total		39	82	141	161	168	170	16	54	**831**

Table 1.3.e: List of milestones

Milestones have been defined as control points at the work package level, and as such they are included in the WP tables. The following table collects all defined milestones, sorting them by production date.

In addition to them, the table also contain *Global Milestones* (named as **GMSx**, and marked in bold). These are project-wide control points, which collect the output produced by different WPs at time points that can be used to assess global project performance.

MS No.	Milestone name	WP involved	Expected date	Means of verification
MS2.2	Scenarios and use cases	2	M04	Milestone report
MS8.1	Dissemination material ready and web site operational	8	M06	Website online and material available
MS5.2	User contexts in social annotations	5	M08	Milestone report
MS1.1	Successful completion of first project review	1	M12	Review report
MS4.7	Initial user interface engine	4	M12	Technical software validation; validation against reqs in MS2.4
MS5.4	Initial model for semantic extraction	5	M12	Availability of model (as reported in D5.1)
MS6.1	Report on validation methodology	6	M12	Milestone report
MS4.5	Initial contagious tagging infrastructure	4	M16	Milestone report; later validation in Deliverable D4.4
MS5.6	Early search engine for social media	5	M16	Technical software validation, user tests
MS2.3	SPIN technology user requirements	2	M18	Requirements available; later validation against the system
MS2.4	SPIN user interface requirements	2	M18	Requirements available; later validation against the system
MS3.1	Fully functional module for metadata modelling and extraction	3	M18	Technical software validation
MS3.2	Initial module for semantic timeline representations	3	M18	Technical software validation
MS3.4	Initial module for modelling and content characterization	3	M18	Technical software validation
MS4.1	Profile acquisition and update	4	M18	Technical software validation; validation against profile specification in D4.1
MS4.3	Initial media delivery module	4	M18	Technical software validation; validation against platform specification in D4.3
MS5.7	Early navigation engine for social media	5	M18	Technical software validation, user tests
MS6.2	SPIN software base platform	6	M18	Availability of software; validation against Deliverable D6.2

MS No.	Milestone name	WP involved	Expected date	Means of verification
MS8.3	Completion of training in user evaluation methods	8	M18	Milestone report
GMS1	**SPIN base components and intermediate system**	**2,3,4,5,6**	**M18**	**Milestone report; validation of base components against MS2.3 and intermediate demonstrator D6.3 available**
MS7.1 .x	Demonstrations of single SPIN modules	7	M18, M24, M30	Demonstrations performed
MS1.2	Successful completion of second project review	1	M24	Review report
MS2.5	Initial analysis on acceptance of SPIN-components	2	M24	Availability of Deliverable D2.7
MS3.6	Initial prototype for learning and reasoning	3	M24	Technical software validation
MS3.7	Initial version of perception-based coder	3	M24	Technical software validation; validation against specification in Deliverable D3.7
MS4.2	Fully functional social profile manager	4	M24	Technical software validation
MS5.1	Ontology management environment fully functional	5	M24	Technical software validation in D5.3 incl. validation against ontology specification
MS5.5	Semantic context software infrastructure	5	M24	Technical validation against specification in Deliverable D5.5
MS8.2	Analysis of potential technology transfer	8	M24	Milestone report
GMS2	**SPIN initial user validation and final specification**	**2, 6**	**M24**	**Validation as reported in D2.7; system specification incorporating user feedback available in D6.4**
MS3.3	Final module for AV semantic timeline representations	3	M30	Technical software validation; comparison against D3.2
MS3.5	Final module for multimodal modelling and content characterization	3	M30	Technical software validation; later report in Deliverable D3.6
MS4.4	Fully functional module for media adaptation	4	M30	Technical software validation; validation against platform specification in D4.3
MS4.8	Fully functional user interface engine	4	M30	Technical software validation; validation against reqs in MS2.4
MS5.3	Final semantic social network module	5	M30	Technical software validation, as reported in D5.4
MS5.8	Professional access engine for social media	5	M30	Expert validation by user organizations
MS5.9	Fully functional module for relevance feedback in semantic search	5	M30	Technical software validation; later reported in Deliverable D5.8
MS6.3	Validation of intermediate SPIN system	6	M30	Validation report

MS No.	Milestone name	WP involved	Expected date	Means of verification
MS7.2	Running social media system demonstrator	7	M30	Demonstrator available
GMS3	**SPIN full demonstrator and validation of intermediate system**	**2,3,4,5,6**	**M30**	**Milestone report; validation in MS6.3 & demonstrator available in MS7.2**
MS2.6	Final analysis of user acceptance of SPIN-components	2	M32	Milestone report; later availability of Deliverable D2.8
MS1.3	Successful completion final project review	1	M36	Review report
MS2.1	SPIN long term market perspectives	2	M36	Milestone report & availability of Deliverable D2.2
MS2.7	Results of the field trials	2	M36	Availability of Deliverable D2.8
MS3.8	Fully functional perception-based coder	3	M36	Technical software validation; validation against specification in Deliverable D3.7
MS4.6	Fully functional module for contagious tagging	4	M36	Technical software validation
MS6.4	Fully functional SPIN system	6	M36	System availability and technical validation
MS7.3	Final demonstration of the SPIN social media system	7	M36	Demonstration report

1.3.3 Timing of Workpackages

RTD - WP2

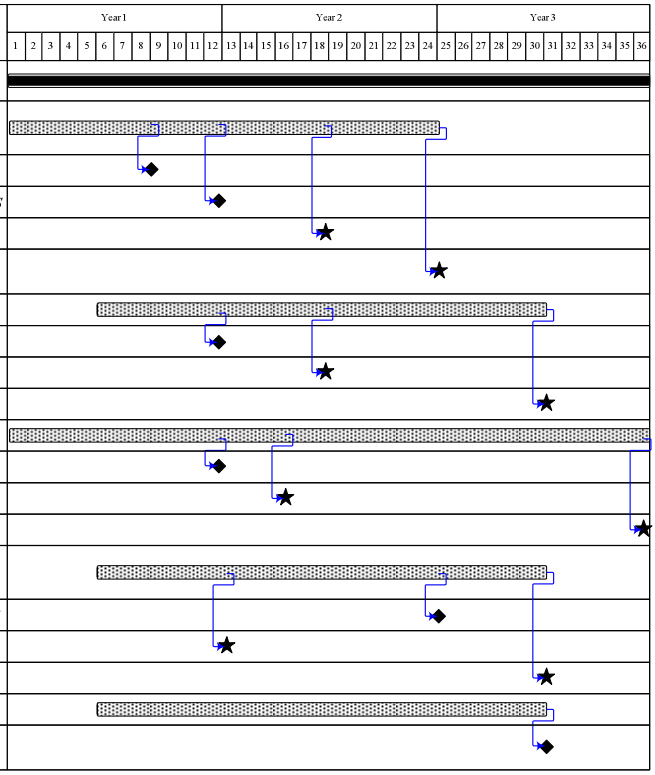
Task	Description of Work	Year 1												Year 2												Year 3											
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
WP2	**User Centredness**																																				
T2.1	Market and technology analysis																																				
D2.1	*Initial report on social media: market and technology*																																				
D2.2	*Final report on social media: market and technology*																																				
MS2.1	*SPIN long term market perspectives*																																				
T2.2	Psychological analysis of user generated content descriptions																																				
D2.3	*Report on tagging and user intentions*																																				
D2.4	*Report on psychological analysis of prosumer descriptions*																																				
T2.3	User requirements and human factors in SPIN technology																																				
D2.5	*Preliminary report on SPIN technology user requirements*																																				
MS2.2	*Scenarios and use cases*																																				
MS2.3	*SPIN technology user requirements*																																				
T2.4	User-centred requirements for SPIN interfaces																																				
D2.6	*Preliminary report on SPIN user interface requirements*																																				
MS2.4	*SPIN user interface requirements*																																				
T2.5	Usability validation																																				
D2.7	*Initial report on user acceptance of SPIN-components*																																				
D2.8	*Final report on user acceptance and field trials*																																				
MS2.5	*Initial analysis on acceptance of SPIN-components*																																				
MS2.6	*Final analysis ser acceptance of SPIN-components*																																				
MS2.7	*Results of the field trials*																																				

RTD – WP3

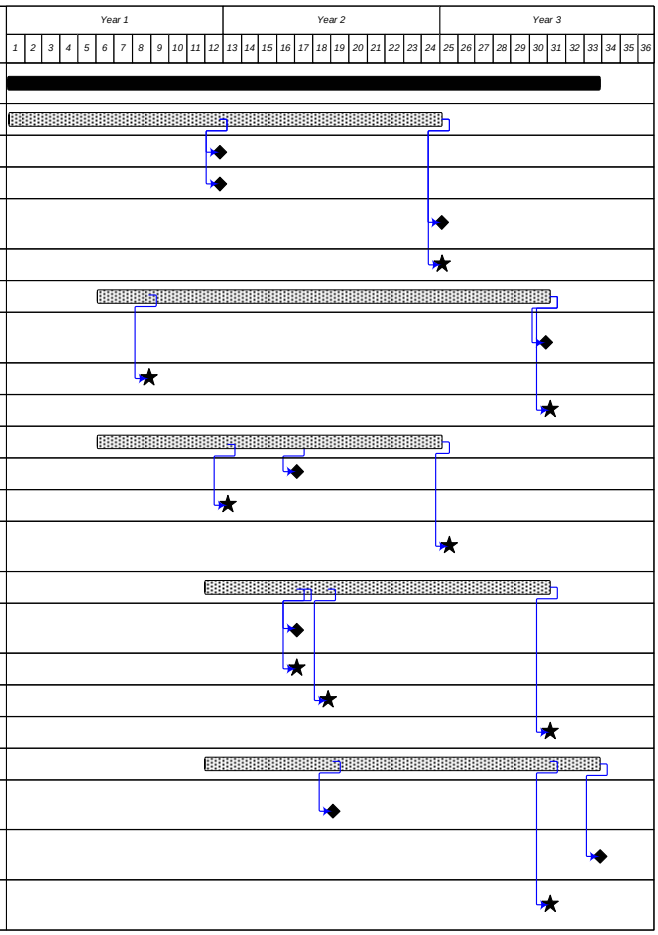
Task	Description of Work	Year1 (1–12)	Year2 (13–24)	Year3 (25–36)
WP3	**Semantic Structuring and Characterization**			
T3.1	Metadata structuring analysis and interoperability			
D3.1	*Specification of the metadata modelling and metadata extraction subsystem*			
MS3.1	*Fully functional module for metadata modelling & extraction*			
T3.2	AV semantic timeline representations			
D3.2	*Report on AV semantic timeline representations*			
MS3.2	*Initial module for AV semantic timeline repr.*			
MS3.3	*Final module for AV semantic timeline repr.*			
T3.3	Multimodal modelling and content characterization			
D3.3	*Specification of multimodal modelling and content characterization*			
MS3.4	*Initial module for multimodal modelling and content characterization*			
MS3.5	*Final module for multimodal modelling and content characterization*			
T3.4	Learning and reasoning in feature space			
D3.4	*Report on learning and reasoning tech. implemented in SPIN*			
MS3.6	*Initial prototype for learning and reasoning on semantic metadata*			
T3.5	Categorization and management of semantic content			
D3.5	*Report on categorization and management of semantic content*			
D3.6	*Report on SPIN techniques for semantic structuring and content characterization*			
T3.6	Perception-based media summarization and coding			
D3.7	*Specification of the prototype for perception-based media summarization*			
MS3.7	*Initial version of perception-based coder*			
MS3.8	*Fully functional perception-based coder*			

RTD – WP4, WP5

Task	Description of Work
WP4	**Prosumer Communities**
T4.1	Multi-level personalization and building of social profiles
D4.1	*Specification of metadata for user profiles*
D4.2	*Init. social pro. manager with community features*
MS4.1	*Profile acquisition and update*
MS4.2	*Fully functional social profile manager with community features*
T4.2	Intelligent content adaptation and delivery
D4.3	*Spec. of media adaptation & delivery platform*
MS4.3	*Initial media delivery module*
MS4.4	*Fully functional module for media adaptation*
T4.3	Collaborative mm. metadata tagging modules
D4.4	*Report on contagious tagging infrastructure*
MS4.5	*Initial contagious tagging infrastructure*
MS4.6	*Fully functional module for contagious tagging*
T4.4	Interfaces & tools for media query, navigation & creation
D4.5	*Specification of media query and navigation tools*
MS4.7	*Initial user interface engine*
MS4.8	*Fully functional user interface engine*
T4.5	Trust, privacy and copyrights in social media
D4.6	*Report on models and protocols for managing trust, privacy and copyright issues*

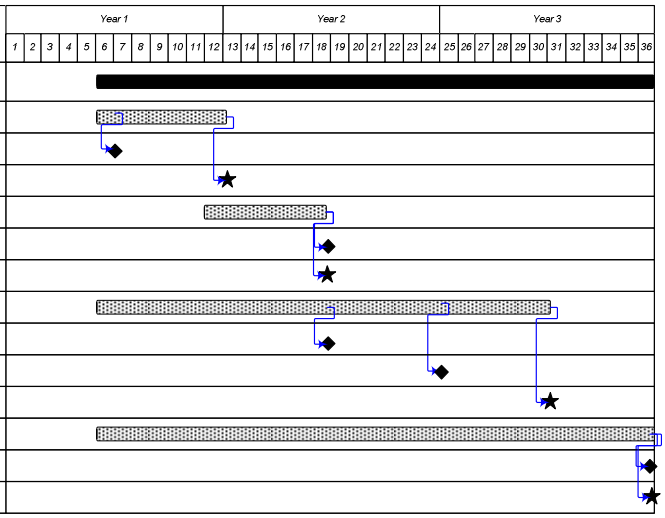


Task	Description of Work
WP5	**Semantics in Social Networks**
T5.1	Style, culture and ontologies
D5.1	*Social tagging analysis and model*
D5.2	*Initial spec. of onto for SPIN's media objects*
D5.3	*Report on testing and validation of ontology management environment*
MS5.1	*Ontology man. environment fully functional*
T5.2	Emergent semantics from collective annotations
D5.4	*Final report on SPIN's semantic social network annotations*
MS5.2	*User contexts in social annotations*
MS5.3	*Final semantic social network module*
T5.3	Semantic context matching for media items
D5.5	*Spec. semantic context software infrastructure*
MS5.4	*Initial model for semantic extraction*
MS5.5	*Final module for multimodal modelling and content characterization*
T5.4	Distributed media linking and searching
D5.6	*Specification of first semantic extraction and linking engine from tagging and analysis*
MS5.6	*Early search engine for social media*
MS5.7	*Early navigation engine for social media*
MS5.8	*Professional access engine for social media*
T5.5	Relevance feedback and knowledge update
D5.7	*Final specification of semantic extraction & linking engine including relevance feedback*
D5.8	*Report on testing of SPIN's relevance feedback and knowledge update*
MS5.9	*Fully functional module for relevance feedback in semantic search*



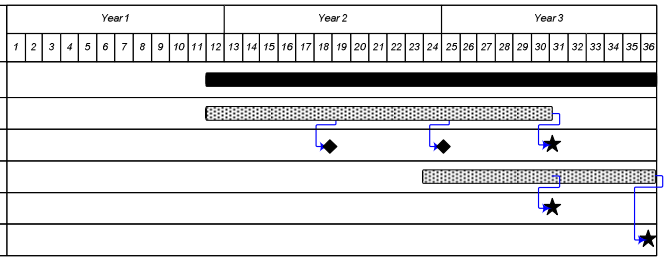
RTD – WP6

Task	Description of Work
WP6	**System Architecture and Integration**
T6.1	System requirements and methodology
D6.1	*Tech. rep. on sys. architecture & inte. method*
MS6.1	*Rep. on validation area, method & meas. criteria*
T6.2	SPIN architecture and platform
D6.2	*Tech. rep. on software architecture & app. Spec.*
MS6.2	*SPIN software base platform*
T6.3	Application integration
D6.3	*Software demonstrator: intermediate version*
D6.4	*Specification of final SPIN system prototype*
MS6.3	*Validation of intermediate SPIN system*
T6.4	Software testing and technical validation
D6.5	*Technical report on validation results*
MS6.4	*Fully functional SPIN system*



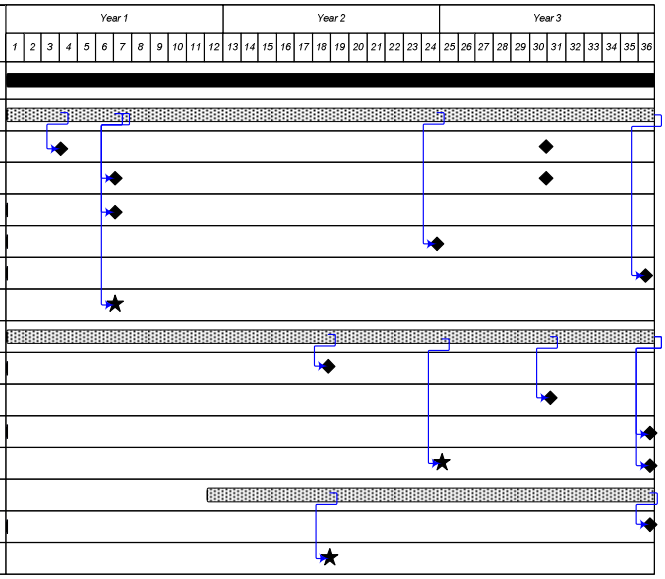
DEMO - WP7

Task	Description of Work
WP7	**Demonstration**
T7.1	Demonstration of components
MS7.1	*Demonstrations of single SPIN modules*
T7.2	Demonstration of SPIN social media system
MS7.2	*Running social media system demonstrator*
MS7.3	*Final demo. of the SPIN social media system*



OTHERS - WP8

Task	Description of Work
WP8	**Dissemination and Exploitation**
T8.1	Dissemination activities
D8.1	*Web site*
D8.2	*Dissemination material*
D8.3	*First dissemination plan*
D8.4	*Final dissemination plan*
D8.5	*Dissemination report*
MS8.1	*Diss. material ready and web site operational*
T8.2	Exploitation activities
D8.6	*First exploitation plan*
D8.7	*Final exploitation plan*
D8.8	*SPIN exploitation report*
MS8.2	*Analysis of potential technology transfer*
T8.3	Training activities
D8.9	*Training activities report*
MS8.3	*Completion of training in user eval. methods*

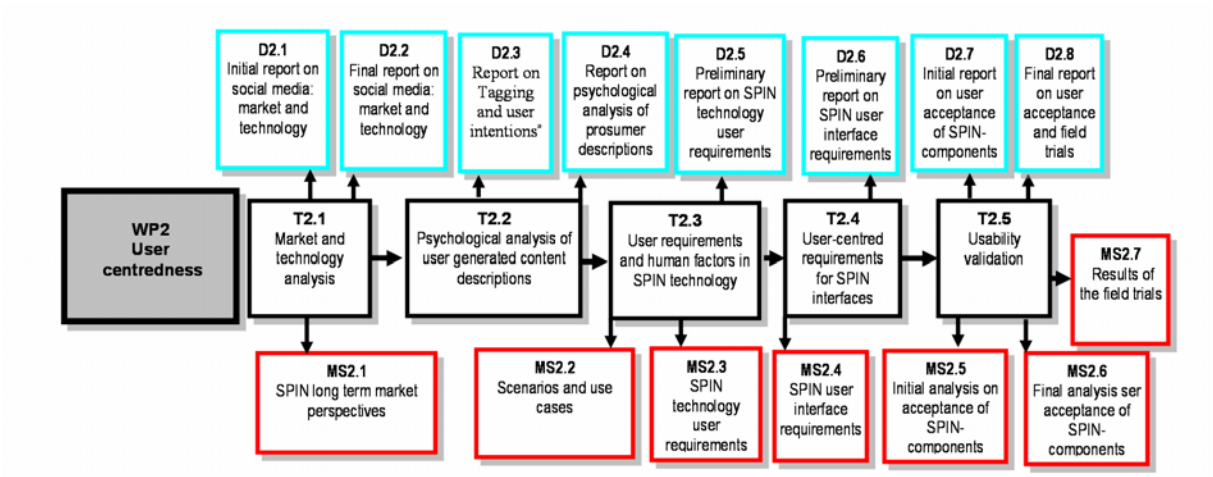


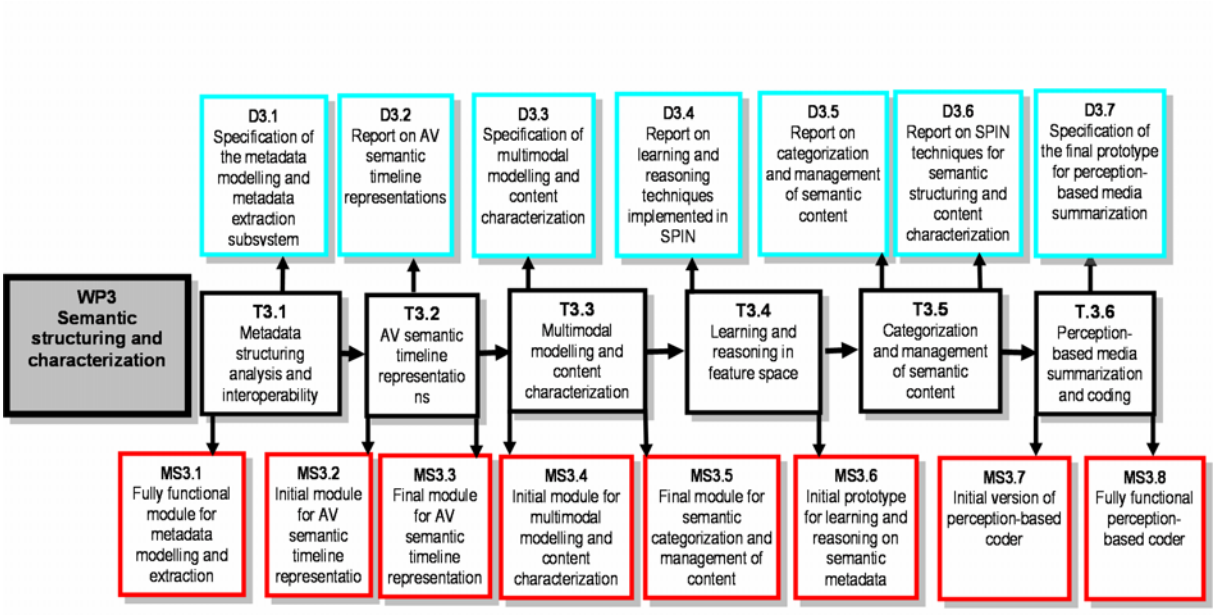
Management – WP1

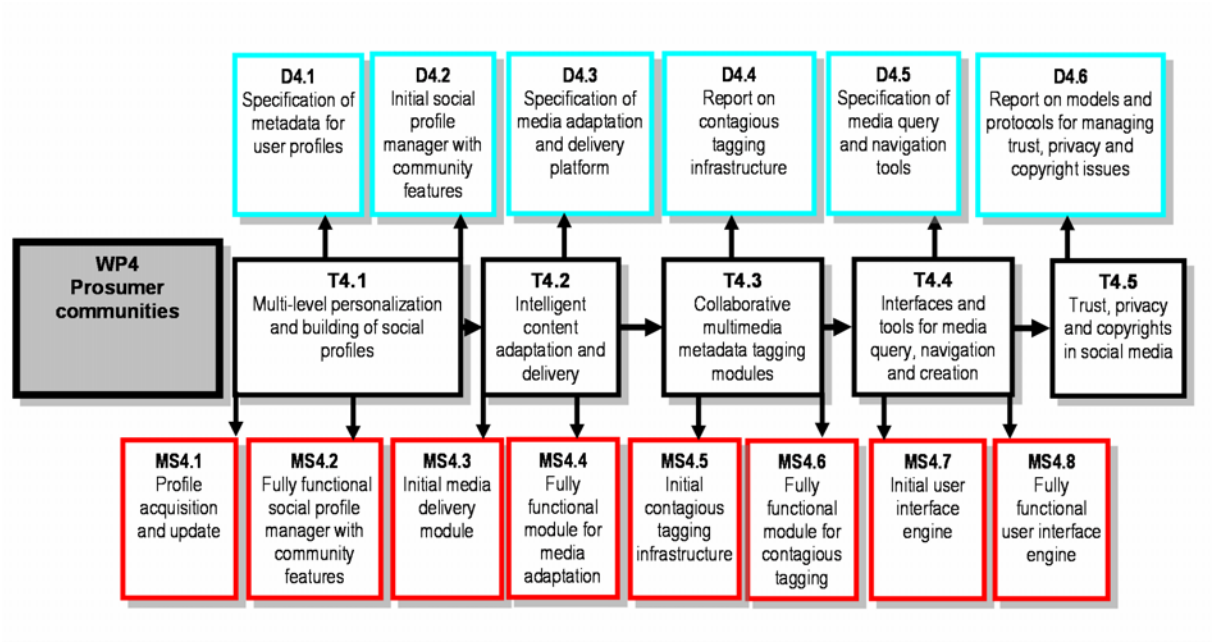
Task	Description of Work	Year 1											Year 2											Year 3										
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
WP1	**Project management**																																				
T1.1	Project administration																																				
D1.1.x	*Two monthly management reports*	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
D1.2.x	*Six monthly progress reports*						◆	I					◆						◆						◆						◆						◆
D1.3.x	*Yearly progress reports*												◆												◆												◆
D1.4	*Public final report*							I																													
D1.5	*Private final report*																																				
MS1.1	*Successful completion of first project review and achievement of all technical objectives and milestones set for the first year*												★																								
MS1.2	*Successful completion of second project review and achievement of all technical objectives and milestones set for the second year*																								★												
MS1.3	*Successful completion final project review and achievement of all technical objectives and milestones set in the project*																																				★
T1.2	Financial and legal issues																																				
D1.6.x	*Yearly financial reports*							I					◆												◆												◆
T1.3	Quality control and project assessment																																				
D1.7.x	*Six monthly quality assurance reports*							◆					◆						◆						◆						◆						◆

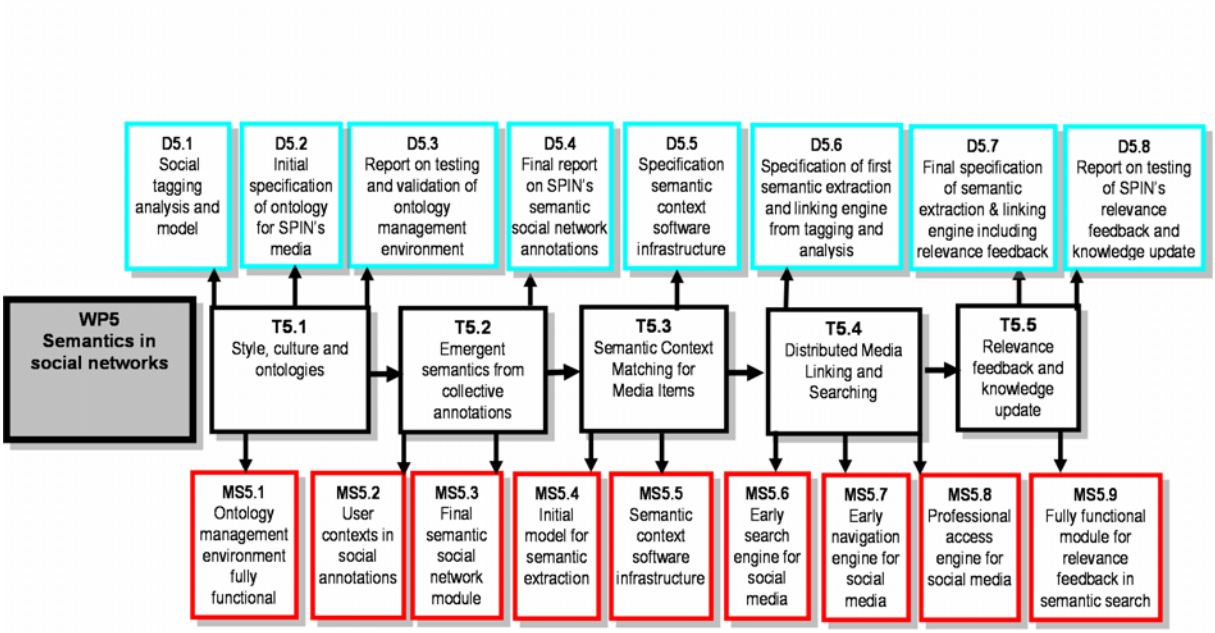
1.3.4 Dependencies between Project Components

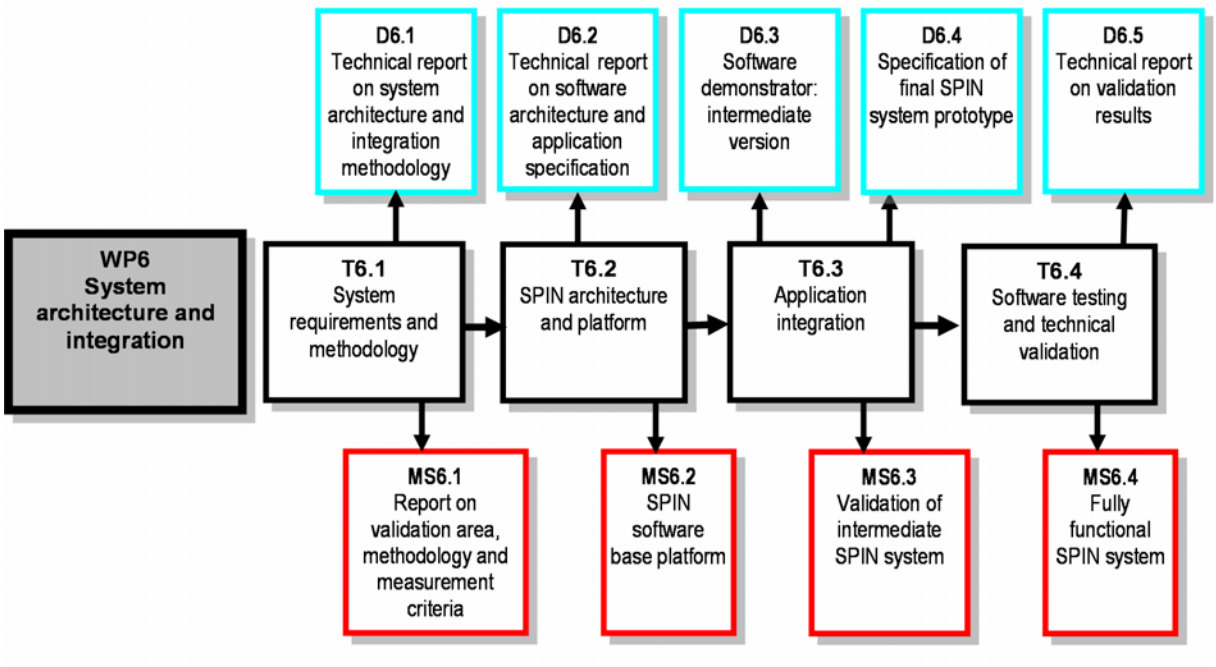
RTD WP2-WP6



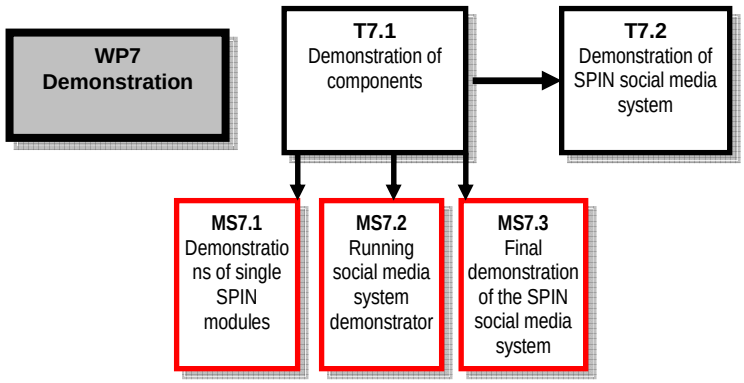



D4.1
Specification of metadata for user profiles
D4.2
Initial social profile manager with community features
D4.3
Specification of media adaptation and delivery platform
D4.4
Report on contagious tagging infrastructure
D4.5
Specification of media query and navigation tools
D4.6
Report on models and protocols for managing trust, privacy and copyright issues
WP4
Prosumer communities
T4.1
Multi-level personalization and building of social profiles
T4.2
Intelligent content adaptation and delivery
T4.3
Collaborative multimedia metadata tagging modules
T4.4
Interfaces and tools for media query, navigation and creation
T4.5
Trust, privacy and copyrights in social media
MS4.1
Profile acquisition and update
MS4.2
Fully functional social profile manager with community features
MS4.3
Initial media delivery module
MS4.4
Fully functional module for media adaptation
MS4.5
Initial contagious tagging infrastructure
MS4.6
Fully functional module for contagious tagging
MS4.7
Initial user interface engine
MS4.8
Fully functional user interface engine

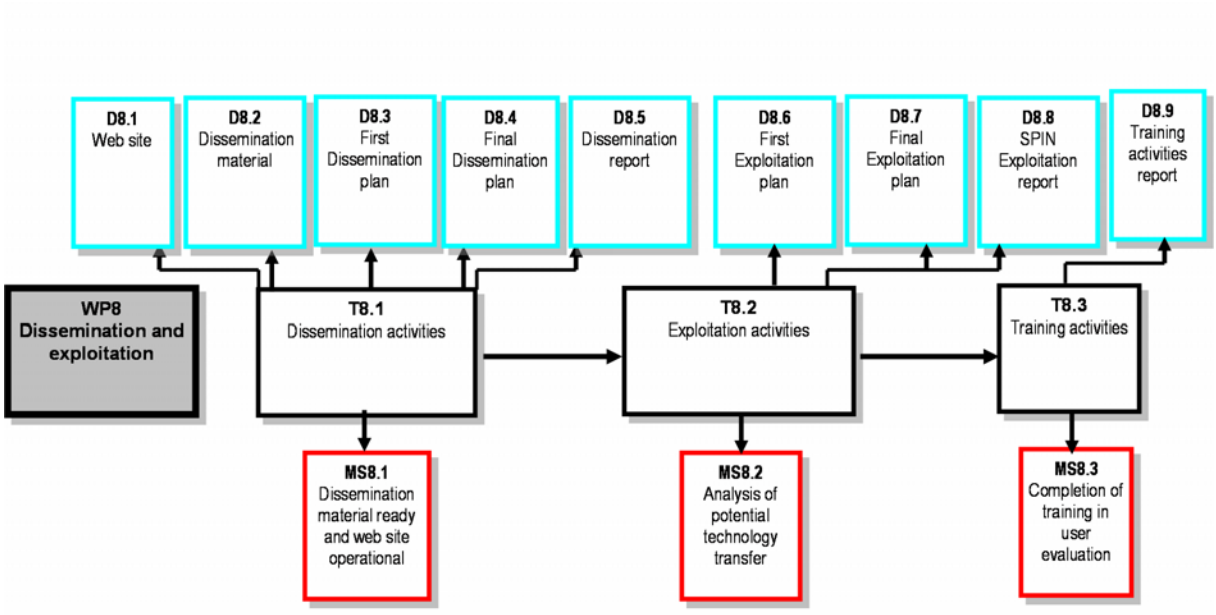

D5.1
Social tagging analysis and model
D5.2
Initial specification of ontology for SPIN's media
D5.3
Report on testing and validation of ontology management environment
D5.4
Final report on SPIN's semantic social network annotations
D5.5
Specification semantic context software infrastructure
D5.6
Specification of first semantic extraction and linking engine from tagging and analysis
D5.7
Final specification of semantic extraction & linking engine including relevance feedback
D5.8
Report on testing of SPIN's relevance feedback and knowledge update
WP5
Semantics in social networks
T5.1
Style, culture and ontologies
T5.2
Emergent semantics from collective annotations
T5.3
Semantic Context Matching for Media Items
T5.4
Distributed Media Linking and Searching
T5.5
Relevance feedback and knowledge update
MS5.1
Ontology management environment fully functional
MS5.2
User contexts in social annotations
MS5.3
Final semantic social network module
MS5.4
Initial model for semantic extraction
MS5.5
Semantic context software infrastructure
MS5.6
Early search engine for social media
MS5.7
Early navigation engine for social media
MS5.8
Professional access engine for social media
MS5.9
Fully functional module for relevance feedback in semantic search


D6.1
Technical report on system architecture and integration methodology
D6.2
Technical report on software architecture and application specification
D6.3
Software demonstrator: intermediate version
D6.4
Specification of final SPIN system prototype
D6.5
Technical report on validation results
WP6
System architecture and integration
T6.1
System requirements and methodology
T6.2
SPIN architecture and platform
T6.3
Application integration
T6.4
Software testing and technical validation
MS6.1
Report on validation area, methodology and measurement criteria
MS6.2
SPIN software base platform
MS6.3
Validation of intermediate SPIN system
MS6.4
Fully functional SPIN system

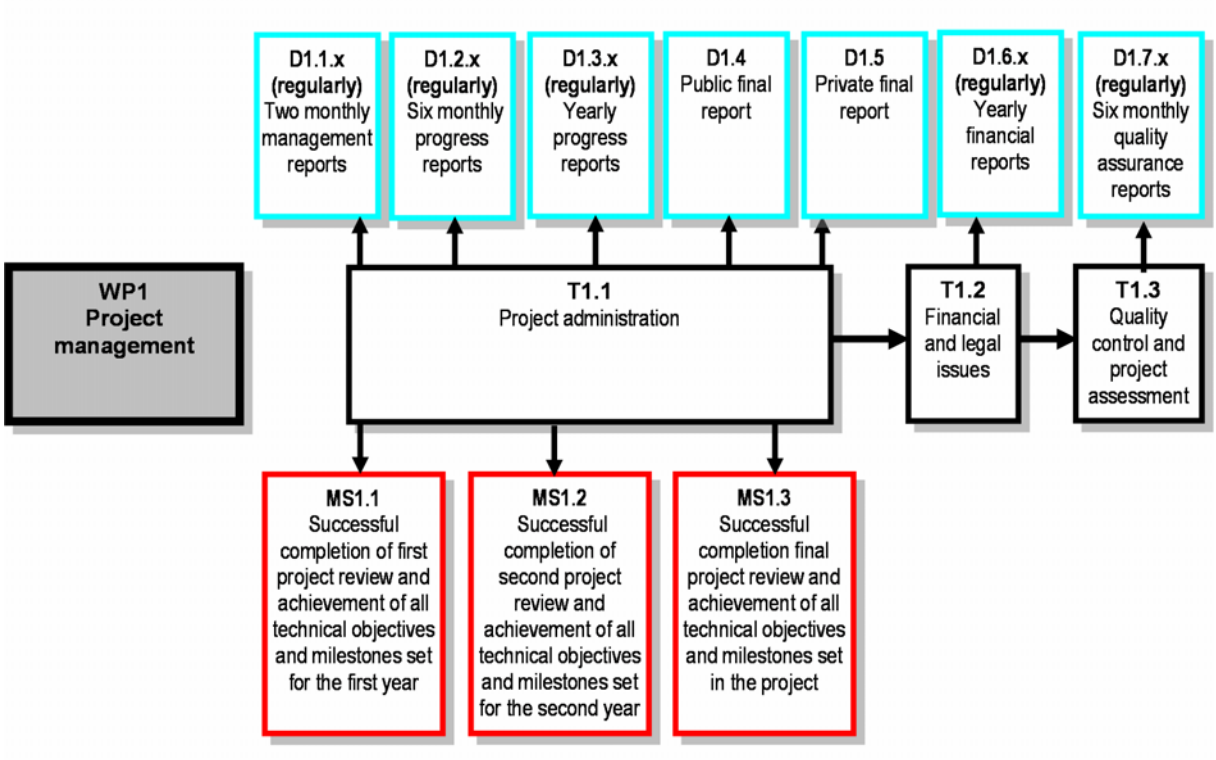
DEMO WP7


WP7
Demonstration
T7.1
Demonstration of components
T7.2
Demonstration of SPIN social media system
MS7.1
Demonstrations of single SPIN modules
MS7.2
Running social media system demonstrator
MS7.3
Final demonstration of the SPIN social media system

OTHERS WP8



MANAGEMENT WP1



Section 2: Implementation

2.1 Management Structure and Procedures

2.1.1 Management Structure

The management of the project is structured in such a way that it will allow the project to address issues swiftly and effectively. The key roles in the project management structure are the following:

- The Supervisory Board (SB)
- The Management Board (MB)
- The Technical Committee (TC)
- The WP Leaders (WPL)
- The Project Office (PO)

The project management hierarchy of the above roles is shown below:

Figure 5: Project management hierarchy

With respect to the above roles, a multi-tier management approach will be followed in order to facilitate the needs of the consortium and ensure proper and efficient management. At the top of the hierarchy, the Supervisory Board will maintain ultimate authority in the project. The Management Board will be the core organisational and decision-making body, reporting back to the Supervisory Board for key-decisions that affect the structure and success of the project. The Technical Committee will coordinate the technical work plan in close collaboration with the Workpackage Leaders and supervised by the Management Board for proper coordination between the different WPs. Finally, the Project Office will provide all the administrative support required by the above roles to seamlessly conduct their responsibilities.

Overall management and administration is undertaken by the Project Coordinator who ensures coordination in all different management tiers. Administration and collaborative work tools and instruments are tasks undertaken by the Project Office, which comprises of

infrastructure and resources as a combination of administration, financial management, project document repository, archive e-mail list administration and project on-line portal which all support the administration.

2.1.2 Roles and Responsibilities

The clear separation of roles, responsibilities and jurisdiction between the different management entities is mandated for the successful management and coordination of the project. This separation is outlined graphically in the following figure.

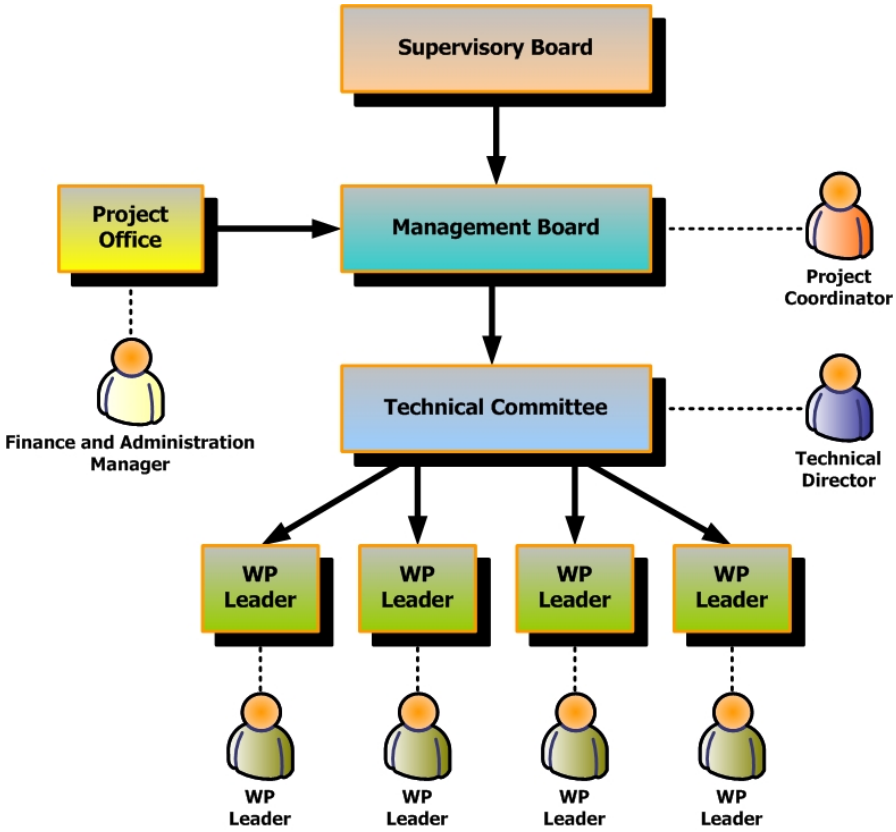


Figure 6: Project management structure

Supervisory Board (SB)

The Supervisory Board is composed of high-ranking officials of each Contractor (one person per Contractor). This representative must have the legal authority to officially conduct business on behalf of the legal entity (Contractor) they represent. The Supervisory Board has the obligation to ensure that the Consortium functions properly. While the SB will not meet regularly, meetings may be called upon whenever necessary. The SB decides on matters relating to:

- all budget-related activities,
- the alteration of the Consortium Agreement, and
- the premature completion / termination of the Project

Management Board (MB)

The Management Board, chaired by the Project Coordinator, is the core organisational and decision-making body, providing overall direction and management. It will be responsible for the successful completion of the project and the exploitation of its results. The MB will report and be accountable to the SB. The MB consists of:

- The Project Coordinator
- The Technical Coordinator
- The Finance and Administration Manager
- The WP leader of each WP

Decisions regarding the project will be made by the MB through simple majority, with each member of the MB having a single vote (and limited to one vote per Contractor). In cases of a tie, the Project Coordinator will have the casting vote. The MB will meet at least once per year. In practical terms the MB represents the Consortium in all related affairs. The responsibilities of the MB include, but are not limited to:

- Overlooking the overall project plan and work progress
- Monitoring the use of resources and budget
- Producing and maintaining the overall risk management and contingency plan
- Controlling the allocation of work and address changes in the work allocated to partners depending of change of circumstances
- Resolving and arbitrating conflicts if and when these arise

Project Coordinator (PC)

The Project Coordinator is designated by the coordinating partner (HHI) and has the authority to run the project on a day-to-day basis on behalf of the MB within the constraints set by the MB and the SB. The responsibilities of the PC are to:

- Maintain all project monitoring plans for effort, budget, tasks and issues. These are provided from each WP leader and the PC maintains a consolidated version of the plans
- Coordinate the project office and financial management activities
- Inform the MB from any deviations from the agreed guidelines of budget and effort that exceeds the agreed thresholds defined by the MB
- Provide the MB with information required to assist the decision making process

The Project Coordinator is also the first point of contact between the Consortium and the European Commission. As such, he is responsible to:

- sign the Contract with the European Commission
- ensure accession to the contract by the other contractors
- ensure the communication between the Consortium and Commission
- receive and distribute the EC contribution
- ensure prompt delivery of all hardware, software and data identified as deliverable items in the Contract as soon as received from the WP Leaders or requested by the European Commission for reviews and audits, including the results of the financial audits prepared by independent auditors

Technical Committee (TC)

The Technical Committee, chaired by the Technical Director, is comprised by one technical leader by each Contractor and reports to the MB. It has the following responsibilities:

- Leadership and coordination of technical activities
- Responsibility for technical set-up and customisation of the pilots
- Definition of the architecture and constant monitoring that the development and technical work adhere to the architecture
- Technology and market watch, ensuring that technical work remains at state of the art level
- Any technological developments that could render work within the project obsolete or redundant

The TC will meet quarterly or whenever an issue within the project occurred.

Technical Director (TD)

The Technical Director will be appointed by NKUA. The TD will chair the TC and will also be part of the MB. The TD will be responsible for the technical coordination and supervision of the workpackages, planning and control of activities.

Workpackage Leader (WPL)

Each WP is lead by a single partner (WPL) that assumes responsibilities for the work undertaken in the work package and reports to the TC and the MB. The responsibilities of the WP leader are as follows:

- Has a seat in the MB and participates in the overall project steering
- Produces and maintains the WP project plan and resource allocation in collaboration with the PC and TD
- Proposes and justifies to the MB any changes in the WP composition in terms of effort and budget allocation
- Liaises with other WP leaders and the TD towards aligning and harmonising the work in the WP with other work packages

Project Office (PO)

The project office, represented by the Finance and Administrator Manager, comprises of infrastructure and resources supporting the project management structure in the day to day management and administration of the project. The PO is responsible for:

- Tracking of the plan, tasks issues, budget, partner and commission contacts
- Updating and consolidating of work plans towards producing project-wide task and issue lists
- Providing the support tools to the PC and MB. Such tools include budgetary analysis, deliverable templates etc.
- Facilitating the communication channel for the project. The primary communication channel for the project is via e-mail reflectors that are provided by the PO. The project will feature different reflectors to support the work undertaken in smaller groups within the consortium

- Assisting in the administration and facilitation of project meetings both in terms of logistics as well as in terms of organising the agendas before and minutes and task lists after meetings

2.1.3 Procedures

Conflict Resolution and decision making process

Attempts will be made to resolve conflicts as close as possible to the source of the conflict. The TC will be responsible for resolving conflict occurring under the work packages assigned to them. They will employ a problem solving approach in order to achieve consensus, ensuring a win-win outcome for conflicting parties. If conflicts cannot be resolved at that level, the MB will be asked to intervene. Conflict resolution, voting and decision making process will be clearly defined in the Project management bylaws to be agreed and signed off by the SB.

The project management bylaws safeguard the smooth execution of the project. Any issues that lies outside the tolerances set by the TC are put to a vote among the MB. A tiered approach will be taken with the first vote needing 75% majority, the second 50% while if this is not achieved the issue is arbitrated to the SB. Veto rights are granted to every consortium partner in which case resolution is deliberated in consultation with the commission.

Decision making process

The decision making process is structured in multiple tiers based on the tolerances set by the SB. The following processes are defined with regards to the decision making process:

- The MB can take decisions based on the tolerances that have been set out by the SB. The tolerances can ONLY be defined with regards to swift of budget and effort as well as redefinition of the work-plan (up to a predefined extent)
- Any decisions that exceed the tolerances are taken by the SB. Majority vote SHALL be sufficient. The SB members can cast a vote of:
  - Approve
  - Not Approve
  - Abstain
- For a decision to be valid it will need to have 100% of the votes of the SB. SB members can vote by proxy only by communicating to the Project Coordinator the appropriate mandate. If the first vote does not achieve 100% participation a second ballot requiring 75% participation is organised. If that also proves unsuccessful in reaching a decision then a third and final ballot will be undertaken with not minimum requirement for participation. It is at the discretion of the Project Coordinator to define either longer time intervals between ballots in order to facilitate due diligence or short ones to address issues that require timely resolution
- If the SB is divided i.e. overall majority can not be reached because the votes are split equally or because all three SB ballots failed to produce a majority vote, then ballot is extended to the whole consortium which will include affiliated partners and/or partners that participate without funding. Each partner active at the time of the ballot has one vote and all votes carry equal weight. The vote is cast by the authorised partner representative

- If all of the above steps have been followed and still a decision can not be made (either because SB and the consortium is divided) then the decision will go towards the option that produces no change in the status quo (i.e. if a decision on removing a partner is required and can not be reached then final outcome will be towards not removing the partner in question)
- The SB reserves the right to consult the commission on decision making process. Any decisions reached by the SB or the consortium shall be legal and adhere to the consortium agreement

The SB has also the authority to arbitrate conflicts that arise between the consortium members at any level. Any member of the consortium has the right to challenge the decision of the Project Coordinator, Technical Director and/or the WP Leader (one that was adhering to the tolerances set by the SB). However the SB's decision is final. All voting SHALL be public (unless otherwise agreed) and the vote of each party taking part in the ballot shall be made known to the ballot constituency ONLY. For example SB ballot votes that did not include the whole consortium need only be made available to the SB whereas only the final outcome need to be communicated to the consortium, whereas in the case of consortium wide.

The Project Office facilitates the process of the ballots and ballots SHALL be accepted electronically through the project portal. Therefore each member of the consortium MUST make sure that s/he does not disclose the access password to the project portal to anybody else. When a decision is reached at a meeting then the minutes of the meeting account as the official ballot outcome and vote register.

Consortium Agreement

It is foreseen that should the proposal be successful and project representatives are asked to enter the negotiation phase that the Project Coordinator initiates the process of drafting, circulating and having a Consortium Agreement signed, that legally binds all consortium participants.

Project Assurance

For assuring the proper quality of the work conducted during the project, a Project Assurance Team will be created and split into two sub-teams, the Technical Assurance (TA) Team and the Quality Assurance (QA) Team. The QA team is a subgroup of the MB while the TA team is a subgroup of the TC.

Project Controls

Project Controls ensure that the project is producing the required product(s) and is being carried out within the agreed constraints of time, cost and quality. For this project the following controls will be implemented.

- Management by Exception

  The MB sets tolerances for time, cost and quality. Within these tolerances the Project Coordinator is authorized to take corrective actions as necessary
- Quality Management

  Quality plans describe the acceptance criteria for the deliverables of each work package, how conformance to these criteria will be measured, when quality checks will be performed and by whom

Change Management

Scope changes can occur for many reasons: changes in requirements and specifications (due to internal or external reasons), deviations from plans, issues, risks etc. Apart from the project scope, changes may have an impact on schedule, budget, quality/performance (or combinations). WP Leaders are authorised to implement changes within the tolerances set by the Project Coordinator; otherwise a request for change is used to escalate changes to the MB.

Meetings

- Kick-Off Meeting

  Formal initiation of the project attended by all partner representatives. Appointment of the SB members, MB members, Technical Director, Work Package Leaders and Project Assurance Team, and definition of their responsibilities
- Consortium Plenary Meeting

  Regular review meeting taking place every three (3) months, attended by the MB, the Project Coordinator, Technical Director and Work Package Leaders while other members attend on a need to basis
- Technical Meeting

  Non predefined intervals meeting – requested by the Project Coordinator, Technical Director or Work Package Leaders to cover technical aspects of the project

Reports

Reporting is planned at two levels.

- Internal quarterly reports from the WP leaders to the Project manager
- External six month reports from the Project manager to the commission

Reports will cover:

- Work and issues addressed for the period
- Resource and budget consumption
- Work for the next reporting period

The reporting structure is shown below:

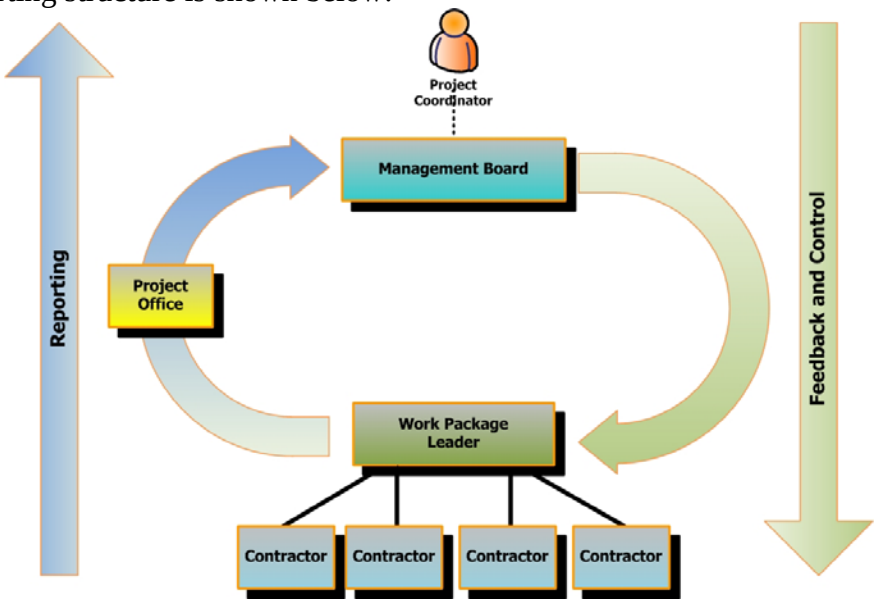


Figure 7: Reporting structure

Tools and instruments

The management structure will make extensive use of the following tools and instruments in order to facilitate the coordination of such a complex project and enhance the communication between all partners:

- Project management S/W tools for time planning and monitoring tasks, issues and deliverables
- Email reflectors for communications. The coordinator will be setting up one reflector for every consortium participant and subsequent ad-hoc lists to accommodate work in smaller interest groups
- Document repository and project portal. Allowing access to all documents produced by the consortium accessed both by FTP and Web browser
- Web site. It is the main dissemination and information to the public tool for the project. The consortium places general purpose information about the project, the consortium composition and the progress and findings of the project.

2.2 Individual Participants

Fraunhofer Institut für Nachrichtentechnik, Heinrich-Hertz-Institut	HHI	RES

Partner Profile

The **Fraunhofer Institute** for Telecommunications, Heinrich-Hertz-Institut is located in Berlin, Germany is undertaking contract research on behalf of industry, the service sector and the government. The HHI with its 260 employees and a yearly budget of about 25 million Euros has its core competences in the areas of photonic networks, mobile broadband systems and electronic imaging technology for multimedia. Its Interactive Media – Human Factors Department pursues research and development in autostereoscopic 3D-displays and mixed-reality technologies, technologies for sensing people and people's intention, multimodal computer interfaces and interaction technologies as well as MPEG-7 based video analysis techniques. Moreover, the department has profound experience and knowledge in usability engineering and human factors research. The department was responsible for work-packages on either multimedia content and/or human-centredness issues in ACTS USINACTS (user centred design support), IST ATTEST (development of a novel 3D display), IST BUSMAN (multimedia content description and retrieval), IST PHOTOLEDD (human factors issues in an OLED-based head-mounted 3D display), and IST METACAMERA (image acquisition and storage for digital cinema).

Role in SPIN

Apart from being the coordinator of SPIN HHI will also offer their long track of expertise in the areas of video content analysis and user-centred design. HHI plans to contribute algorithms to analyze and represent video sub-shots through multi-feature sets, because using units smaller than shots can improve annotation quality and matching performance. For the SPIN requirements process HHI will develop and pursue novel approaches employing subjective rating procedures for requirements ranking and textlinguistic methods of interview analyses.

People involved

Detlef Ruschin studied Telecommunications, Acoustics, and Lighting Engineering with an emphasis on Psychophysics and colour perception. He obtained his Diploma Degree in Electrical Engineering in 1986 from the Technical University of Berlin and has been a staff member of the HHI Human Factors department since. Here he participated in a number of research projects dealing f.i. with the recognition and learning of action sequences in multimedia presentations and with perceptual irrelevancy in motion pictures. Later Detlef become involved with HCI and Computer Mediated Communication research and served as a part-time member for the ACTS USINACTS project. He was a co-founder and associate of the privately owned Usability Lab am HHI, and responsible for the requirements process in IST METACAMERA, where he developed the “requiredness index” as a means of requirements ranking.

Paul Chojecki received the Dipl.-Psych. degree at the University of Bielefeld in April 2005. Additionally to his studies, he had worked half-time as conceptioner and Web developer at the Elephant Seven AG for three years. During this time he was involved in Web and multimedia projects for major customers, where he gained considerable experience in Web technologies, Web usability, interaction and interface design. He joined the Fraunhofer HHI’s Interactive Media - Human Factors Department for an internship, later returning to write his diploma thesis. Since his graduation, he is fully employed at the HHI. Here he already worked in several R&D projects regarding eGovernment and mGovernment (mobile civil services, MoBüD), eAppointment, broadband internet, communication management, accessibility, usability and gesture controlled human-computer interaction techniques. He is an expert in human factors issues, usability and acceptance testing, interface and interaction design.

Valtion teknillinen tutkimuskeskus	VTT	RES

Partner Profile

Technical Research Centre of Finland is an impartial multidisciplinary expert organisation. **VTT**'s special strength is its ability to create new, globally competitive technologies and innovations by combining knowledge and expertise in different fields. With extensive know how VTT produces research, development, testing and information services to public sector and companies as well as international organisations. With its staff of 2750 VTT experts VTT provides high-end technology solutions and innovation services. From its wide knowledge base, VTT can combine different technologies, create new innovations and a substantial range of world class technologies and applied research services. Through its international scientific and technology network, VTT can produce information, upgrade technology knowledge, create business intelligence and value added to its stakeholders. VTT´s technological focus areas are applied materials, bio and chemistry processes, energy, information and communication technologies, industrial systems management, microtechnologies and electronics, and technology in the community. VTT's turnover is 230 Million €.

Role in SPIN

SPIN project utilises VTT's expertise on Human-Technology Interaction research and Media research. **Human-Technology Interaction (HTI)** is a human-centred perspective to technological innovation and development. The aim of HTI research at VTT is to enhance the implementation of information technologies in solutions that are more functional, usable and meaningful for people. VTT's human-technology interaction research is closely integrated to the research and development of different technologies, information society organisations and infrastructures. We conduct confidential research for individual clients as well as participate in multi-party joint ventures.

VTT Media and Internet specialises in media applications including mass media applications and the new socially driven applications where end users are given more role in participating in content and value creation of media services. Metadata creation in different ways (socially by users, automatically) and metadata utilisation are important areas of our expertise. Our expertise areas relevant to current project include media technology, creation and utilisation of metadata and ontologies, mobile end user interaction, user experience and user studies.

People involved

Dr Eija Kaasinen is Senior Research Scientist at VTT. She is in charge of the Media and Mobile Usability research team at VTT as well as of the research strategy of Human Technology Interaction at VTT. Eija Kaasinen has published several scientific articles on usability, human-centred design and mobile services. Eija Kaasinen has over 10 years expertise of software engineering and project management in industry. Eija Kaasinen has been in charge of usability design and evaluation activities in several European and national research projects. Most recently Eija Kaasinen has been a WP leader in a FP6 project MIMOSA (MIcrosystems platform for MObile Services and Applications, 2004-2006), being in charge of human-centred design activities in the project.

Ms. Asta Bäck is Senior Research Scientist at VTT. She is in charge of the Web Media research team at VTT specialising in semantic and collaborative media. The team develops new media concepts and prototypes that combines and personal media and social user interactions. She was the project manager in two eLearning related European projects: CustomDP (2000-2003), and SELEAC (2004-2005), where an eLearning content creating community was set up. She is the project manager in TÄKY-project (2006-2008) dealing with user generated metadata, and she led the project "Rich semantic media for professional and private users (RISE, 2004-2006). She has more than 120 publications registered at the VTT publication register.

Telefónica Investigación y Desarrollo	TID	IND

Partner Profile

Telefónica is the leading telecommunications operator in the Spanish- and Portuguese-speaking world, and one of the largest telecoms sector companies in the world, operating directly in many countries in Europe and Latin America. The companies in the Telefónica group provide a complete range of communications and value-added services across both fixed and mobile networks. Telefónica Investigación y Desarrollo (Telefónica I+D or TID) was created in 1988 to help improve Telefónica's competitiveness through technological innovation, broadening the range and quality of services on offer and making it possible to reduce operating costs. Its natural clients, therefore, are all group companies. Nowadays TID is the most important private company in Spain devoted to R&D. It has five premises (Madrid, Valladolid, Barcelona, Huesca and Granada), with two subsidiaries working in Brazil and Mexico. It employs over 1200 people; 92% of them hold a University degree, mostly on information sciences. TID has participated in numerous European projects, in all Framework Programmes (more than 80 FP6 projects spanning STREPs, Integrated Projects, NoEs and SSAs) and other areas such as COST, Eureka or eContent.

The Multimedia Services Group at Telefónica I+D works on the generation, testing and deployment of multimedia services based on advanced digital video analysis & coding technologies, for client-server Internet-type networks and for broadcast digital TV platforms, taking care of algorithm and system design and integration. The group is geographically distributed, with people working in Madrid, Valladolid and Barcelona. It has participated in past Framework Programme projects; in FP6 it participated in several STREPs and IPs (aceMedia, OLGA, SATLIFE, Medianet, Citizen-Media, RUSHES), some of them still ongoing. A number of them deal with multimedia analysis and semantics. It has also participated in projects within the EUREKA framework, in projects funded at the national level, and in multimedia-related COST actions (COST 211, COST 292). With regard to standards bodies, the group maintains an active participation in the MPEG committee, acting also as co-ordinator of the Spanish National Body.

Role in SPIN

TID has a key role as leader of WP5, in which as WP leader it will coordinate all activities oriented towards the merging of formal semantics with social semantics; for that it will apply the in-house expertise on metadata processing and structuring, annotation management and matching and searching over multimedia metadata. TID has also important related activity in WP3 on metadata extraction from multimedia content, and audiovisual content characterization, as well as in WP4, in which it will collaborate in the personalization activities and help establishing confidence measures for collective annotations.

People involved

Paulo Villegas holds a Telecommunications Engineer degree from Universidad Politécnica de Madrid. He has been working at TID since 1992, first in Madrid and, since 2000, in Valladolid, Spain, in different research groups dealing with multimedia processing, especially video, successively as research engineer, project leader and division manager. He is now working as a senior research consultant. His main interests are related to digital image and video processing, especially in the fields of image and video representation, content analysis and semantics and metadata structuring for multimedia libraries, cataloguing and searching applications. He has taken part in several European research projects, and is also involved in international standardisation initiatives, especially those of the MPEG committee.

Francisco Javier López Benito is an Electronics Engineer from Universidad Politécnica of Madrid, working at TID since 1988. From 1998 to 2000 he assumed the project management of the deployment of the Internet access network of Telefónica in Spain and Argentina. Since 2000 he has been project manager for the integration of the triple play service (Imagenio) in Spain, including network architecture design, development and integration of the first trials, providing TV distribution, VoD and web access, and the development of additional services (like PPV) for the mass deployment over Spain which started in 2004.

Queen Mary, University of London	QMUL	RES

Partner Profile

Queen Mary, University of London (QMUL), it is the third largest college of the federal University of London with proven reputation in coordination and participation in large cooperative projects. It hosts one of the UK leading research groups in multimedia processing, security and intelligent systems – Multimedia and Vision group (MMV). The MMV Group enjoys a distinguished reputation for innovation, receiving direct funding from overseas organisations such as Nokia, Philips, Nortel, the Department of Defence and the EU. Currently, the MMV group has 36 members, including six members of academic staff. The group has participated and coordinated many EU funded projects including RACE MAVT; ACTS MOMUSYS, PANORAMA and Custom TV; Esprit UNITE; Basic research DRUMS; IST SAMBITS, IMPACT, MARINER, SHUFFLE, CRUMPET, EDEN, SAFEGUARD, SCHEMA and many others. Recently, the group coordinated the FP5 IST project BUSMAN, currently coordinates the IST NoE K-Space and the COST292 Action. It is also one of the main contributors and steering member of the FP6 IST Integrated Projects aceMedia, MESH and RUSHES. The group is also leading several UK EPSRC projects including three industrial CASE projects and the industrial project AUDACE with Visiowave and GE industrial.

Role in SPIN

In SPIN, the Multimedia and Vision group will bring expertise in knowledge based multimedia content analysis. As the project coordinator in K-Space project, MMV/QMUL is leading research in semi-automatic annotation of multimedia content by inferring high level knowledge from low-level content analysis. The classification schemes for multimedia content are developed using fuzzy logic, biologically inspired algorithms and evolutionary machine learning techniques to recognise and perform knowledge inference from multimedia content. QMUL is the leader of WP3: Semantic Structuring and Characterization

People involved

Prof. Ebroul Izquierdo is a Chair of Multimedia and Computer Vision and head of the MMV group at Queen Mary University of London. He is a Chartered Engineer, a Fellow member of the The Institution of Engineering and Technology (IET), chairman of the Visual Information Engineering professional network of the IET, a senior member of the IEEE, and a member of the British Machine Vision Association. He is an associate editor of the IEEE Transactions on Circuits and Systems for Video Technology (TCSVT). He has served as guest editor of three special issues of the IEEE TCSVT, two special issues of the journal Signal Processing: Image Communication and three special issue of the EURASIP Journal on Applied Signal Processing. Prof. Izquierdo was the UK representative of the European Network Cost211 on redundancy reduction techniques in video processing. He coordinated the European project BUSMAN involving key industrial players in the multimedia field. Currently, he coordinates and chairs the steering committee of the European research network Cost292 involving 38 institutions world-wide and the network of excellence on semantic inference for automatic annotation and retrieval of multimedia content, K-Space involving 14 European key research institutions and industrial players. He is also a member of the steering committee of the Networked Electronic Media platform NEM.

Dr. John Bigham is a Reader in the Department and heads the Intelligent Systems group, which carries out applied and basic research into a broad range of issues related to the deployment of agent technology in real-world applications. John has worked on a variety of EU-funded projects, including UNITE (Integration of Uncertain and Temporal reasoning) and DRUMS (DefeasibleDefensible Reasoning and Uncertainty Management) within the ESPRIOT Programme. Under ACTS he has participated in GEMA, AIM and IMPACT and in the 5th Framework will be working on the IST Project SHUFFLE.

Autonomy corporation plc	AUT	IND

Partner Profile

Autonomy (www.autonomy.com), was founded in June 1996 out of research under way since 1990. Autonomy is public on London Stock Exchange since 2000 and with two headquarters in San Francisco (USA) and Cambridge (UK) has a worldwide presence maintaining more than 16,000 customers, more than 60 OEM partners and more than 130 VARs and Integrators. Autonomy was founded out of a vision to dramatically change the way in which we interact with information and computers and tackle the increasing deluge of mostly unstructured information individuals and organizations face in their personal and professional everyday life. Gartner Group estimates that 7 million web pages are added to the internet every day and that the volume of unstructured, human friendly information such as emails, word documents, PDFs or web pages, is doubling in the enterprise every three months. In this world of information overload Autonomy's mission is to help organizations understand what matters by automatically uncovering and releasing valuable information from the surrounding noise. Today Autonomy is the world's number one provider of automated infrastructure technology for the processing of unstructured information with a strength, which lies in a unique combination of technologies that use advanced pattern-matching techniques to extract meaning from any piece of text, speech or video. The technology is covered by more than 15 patents, with multiple patents pending.

Role in SPIN

Autonomy has a strong interest in the SPIN project and its aims, as these are very close to the commercial targets of the company. The objectives of Autonomy's technologies are very much in line with those of the proposed project: to automate the discovery of content and its exploitation in new environments. Similar to the SPIN search layer, at the core of Autonomy's products is the Intelligent Data Operating Layer (IDOL), a platform which sits at the center of an enterprise's data and forms a conceptual and contextual understanding of that information. In addition to Autonomy's flagship IDOL product, the Autonomy Group includes: Aungate, a leader in technology for Real-Time Enterprise Governance; Audentify, a leading supplier of next-generation contact center technology; Virage, a leading provider of rich media communication and content management software; and etalk, a leading provider of enterprise-class contact center products. All these products and experience will serve as a guideline for the SPIN design activities so that the final SPIN outcomes are as close to the market requirements as possible. Autonomy, participates in the system design activities and will play a key role in the SPIN exploitation planning.

People involved

Aleš Sobotka is a senior Manager EMEA in Autonomy at the company headquarters in Cambridge, England since January, 2005. He joined Autonomy after leaving the company Exact Software, where he first worked in the Czech branch, and later at the international headquarters in Holland. He came to Exact Software in the position of Customer Support Specialist, and then worked as a Customer Support Expert. At the international headquarters, he worked as the Business Development Manager for the Region of Europe. Aleš Sobotka completed studies at the University of Economics, Prague, and then earned an MBA at The Michael Smurfit Graduate School of Business, Ireland. He speaks Czech, English, Dutch, Greek and Russian.

University of Innsbruck	UIBK	RES

Partner Profile

The **Digital Enterprise Research Institute (DERI) Innsbruck** is one of the internationally leading research groups working on the Semantic Web, Semantic Web services and Service-oriented Architectures. Starting as a research group under the guidance of Prof. Dieter Fensel in 2003, it has officially been turned into a research institute at the University of Innsbruck as of January 2006. DERI Innsbruck has four full-time professors, Prof. Dr. Dieter Fensel (Institute Director), Prof. Dr. Martin Hepp, Prof. Dr. Marcus Spies, and Prof. Dr. York Sure as well as several additional part-time professors. DERI Innsbruck maintains broad international collaboration with many countries outside of Europe, such as the United States, Japan, South Korea, Australia, and Singapore.

DERI Innsbruck has been and is currently involved in a number of FP5 and FP6 EU projects related to the Semantic Web and Semantic Web Services such as SUPER, TripCom, SemanticGov, SEEMP, MUSING, and Knowledge Web. The institute also aims to maintain a lively knowledge exchange with local industry.

The group of Prof. Hepp is also coordinator of the Austrian research project "myOntology", which aims at providing the Wiki-based infrastructure for the collaborative construction of domain ontologies (http://www.myontology.org).

Role in SPIN

UIBK is one of the main research partners in SPIN providing their long track expertise in conceptual modelling and offering their pioneering work in the collaborative construction of lightweight ontologies. UIBK will also introduce in SPIN the concept of economic incentives of ontology construction and usage. UIBK will also participate actively in all dissemination and exploitation activities.

People involved

Prof. Martin Hepp is a professor of computer science at the University of Innsbruck and heads the research group "Semantics in Business Information Systems" at DERI. He earned a Master's degree in Business Management and Business Information Systems from the University of Würzburg in 1999 and a PhD in Business Information Systems from the same institution. Starting the academic year 2003, he became an Assistant Professor of Computer Information Systems at Florida Gulf Coast University in Fort Myers, Florida. He was a Visiting Scholar at Boston University in 2002 and a Visiting Scientist with the e-Business Solutions Group at IBM Research, Zurich Research Laboratory in 2004. Martin currently works in several EU research projects that transfer Semantic Web results into core business domains, SUPER (addressing the use of semantics for Business Process Management) and MUSING, which employs ontologies for next-generation Business Intelligence. His current research interests include Folksonomies, Semantic Wikis, Collaborative Ontology Development, Ontology Management, Ontology Engineering, Business Ontologies, Semantic Web services, and Data and Process Modelling techniques.

Centrum voor Wiskunde en Informatica	CWI	RES

Partner Profile

The Semantic Media Interfaces group at the Centre for Mathematics and Computer science (CWI) carries out research on improving models and tools for presenting multimedia information to end-users on a variety of platforms. CWI is the research institute for mathematics and computer science research in the Netherlands. CWI's mission is twofold: to perform frontier research in mathematics and computer science, and to transfer new knowledge in these fields to society in general and trade and industry in particular. CWI has always been very successful in securing considerable participation in European research programs and has extensive experience in managing these international collaborative research efforts. CWI is also strongly embedded in Dutch university research: about twenty of its senior researchers hold part-time positions as university professors and several projects are carried out in cooperation with university research groups. In addition, CWI has strong links to the World Wide Web consortium, and houses the Benelux office.

Role in SPIN

The SMI group has been closely involved with bringing IPTC NewsML G2 to the Semantic Web. NewsCodes have been expressed in SKOS, the NewsML G2 model has been expressed in OWL and conversion tools are available (http://newsml.cwi.nl/). They have been exploring use cases, such as disambiguated topic search of images, which benefit from the use of explicit semantics in metadata. Through other national and international projects they have expertise in creating Semantic Web based presentation interfaces for cultural heritage media assets. Their role in SPIN will be to provide tools and methods for encapsulating semantics in user-centred scenarios for news information presentation. The SMI group is heavily involved with W3C activities, ensuring both timely incorporation of developing standards within SPIN and appropriate dissemination of project results to an international forum.

People involved

Prof. dr. Lynda Hardman (http://www.cwi.nl/~lynda/) is the head of the Semantic Media Interfaces group and part-time full professor at the Technical University of Eindhoven. During her time in the software industry she was the development manager for Guide, the first hypertext authoring system for personal computers (1986). She was a member of the W3C working group that developed the first SMIL recommendation (1998). She is a member of the K-Space Network of Excedllence and of the MultimediaN E-culture Project, which won the first prize at the Semantic Web Challenge at ISWC '06. She leads research on different aspects of automated generation of hypermedia presentations, with emphasis on aspects of discourse, design and underlying (Semantic) Web and media technologies.

Dr. Raphaël Troncy (http://www.cwi.nl/~troncy/) is a post-doctoral researcher. After a year at the University of Montreal, Canada, he obtained a PhD fellowship at the National Audio-Visual Institute (INA) of Paris where he graduated with honors in 2004. He selected as an ERCIM Post-Doctorate Research Associate 2004-2005. Raphaël Troncy is co-chair of the W3C Incubator Group on Multimedia Semantics, and an active participant in the K-Space Network of Excellence. His research interests include Semantic Web and multimedia technologies, knowledge representation, ontology modeling and alignment. He is an expert in audio visual metadata and in combining existing metadata standards (such as MPEG-7) with current Semantic Web technologies. He works closely with the IPTC standardization body on the relationship between the NewsML language and Semantic Web technologies.

Athens Technology Center S.A.	ATC	SME

Partner Profile

Athens Technology Center S.A. (ATC) (*http://www.atc.gr*) founded in 1987, and since the year 2000, part of the FOURLIS Group of Companies, is a total Information System solutions provider for the Banking and Finance, Media, Business & Commercial sectors, active in the Greek market, the Balkans and the wider EU-marketplace. ATC addresses the Banking & Finance sector with leading systems for e-banking, core banking, ERP for banking, e-trading, real time stock market monitoring, the Media sector with solutions for Content Production, Management & Distribution, as well as the business, commerical and public sectors with solutions for e- commerce (B2B, B2C), corporate and community portals. ATC features more than 15 years of experience in EU and National R&D projects. Research Activities span across all Production Units of the Company, focusing on improving existing technology assets in order to improve the product/services mix offered and investigating feasibility and technology acquisition for enriching the product/services mix in the direction of new technologies.

The portfolio of ATC's Asset Management Solutions involves among others NEWS ASSET - a newsroom automation system for the production, management & distribution of news media assets, with three different Editions: Press, Agency and Broadcast, and DOC ASSET – a document management application which automates the workflow within an Organization regarding document capturing and creation, protocol labelling, use, review, approval, coordination, following, archiving and retrieval and in generally the whole life cycle control of the documents an Organization receives or sends.

Role in SPIN

ATC has a strong interest for participating in the SPIN project as this is totally in line with its commercial interests and in-house developed products. ATC has a long experience in working with newsroom automation systems and has built the applications currently in use by two national News Agencies: the Athens News Agency and the Portuguese News Agency (LUSA). Particularly the application for the Athens News Agency was especially designed and installed for managing all news information during the Athens 2004 Olympic Games, along with a complete video archive solution which was designed for the Athens Olympic Broadcasting (AOB) Corporation integrating Virage components, for who ATC was a key partner.

SPIN will provide the opportunity to ATC to exploit the outcomes of ground breaking research as a tangible resulting application is planned even from the proposal stage. In the course of the project ATC will guide the developments of the demonstrators with the experience of a commercial partner who, although being very successful in the Greek market, has managed to spread into the more remote market channels of Cyprus, Portugal and most of the Balkan countries. In particular, ATC will lead the SPIN dissemination and exploitation activities with significant participation in the system design and integration and the analysis of user requirements.

People involved

Dr Nikos Sarris is a Senior IT Consultant in the ATC Consulting Department. He has received his PhD from the Aristotle University of Thessaloniki and his Master of Engineering degree in Computer Systems Engineering from the University of Manchester Institute of Science and Technology (UMIST). He has worked as a Researcher for the Aristotle University of Thessaloniki and the Informatics and Telematics Institute, where he participated and coordinated several national and European projects. Dr. Sarris has been a member of the Greek Technical Chamber as a Computer Systems and Informatics Engineer since 1996. His research interests include 3D model-based image and video processing, multimedia coding and analysis, and semantic-based knowledge extraction. He is the co-editor of a book in 3D modelling and animation and has authored numerous publications for international journals and conferences. Dr Sarris is the Technical Director of the MESH IP and the coordinator of the GREDIA STREP project.

ST Microelectronics	STM	IND

Partner Profile

STMicroelectronics is a global independent semiconductor company and is a leader in developing and delivering semiconductor solutions across the spectrum of microelectronics applications. An unrivaled combination of silicon and system expertise, manufacturing strength, Intellectual Property portfolio and strategic partners positions the Company at the forefront of System-on-Chip (SoC) technology and its products play a key role in enabling today's convergence trends. According to the most recent data from independent sources, ST is the world's leading supplier of application-specific analog ICs overall with number one rankings in various segments within this field. ST is also the leader in MPEG-2 decoder ICs, and ASICs/ASSPs overall, including a number one position in digital consumer ASSPs. ST is also active in numerous collaborative research projects worldwide as well as playing a key role in Europe's advanced technology research programs such as EU Framework Programs, MEDEA+, and its predecessors, MEDEA and JESSI.

Advanced System Technology (AST) is ST's Corporate Organization dedicated to creating system knowledge that supports ST's system-on-chip (SoC) development. AST's challenge is to combine the expertise and expectations of ST's customers, industrial and academic partners, silicon manufacturing R&D team and internal product groups to create a cohesive, practical vision that define the hardware, software and system integration skills that ST will need in the next three to five years and the strategies required to master them. The AST Multimedia team is active since many years in the definition and integration of a/v streaming systems comprising video codec development, and all the surrounding streaming system tools for service discovery, connection setup, transport protocol and rendering. The team is participating to the FP6 ASTRALS project in this research area. AST is also collaborating with major research organisations and universities in the field of video coding, multimedia streaming and automatic streaming adaptation to network/terminals/user conditions. We also focus on system integration, and we regularly bring our prototypes previewing future multimedia terminals to the most important exhibitions like IBC and CES.

Role in SPIN

STM offer to SPIN the leading experience of a major industrial player in system integration. STM is the integration leader in SPIN, while also working on content analysis and video streaming methods which are in the immediate interests of the company as they are closely coupled with in-house developed technologies

People involved

Fabrizio Simone Rovati received Electronic Engineering degree from Politecnico of Milano in 1995. He has, since 1995, joined STMicroelectronics working on digital video processing algorithms and architectures. He moved to STMicroelectronics Ltd, Bristol (UK) where he worked mainly on architectural studies of digital TV demultiplexing and decoding Systems-on-Chip. He then moved back to Agrate, where he joined AST System R&D group, working on motion estimation algorithms and architectures for digital video encoding systems. He is currently leading a project for multimedia streaming over packet-based networks. The project is developed in partnership with several Italian and U.K. Universities. During his career he has authored or co-authored 15 British, European and U.S. granted patents, 7 international publications in conferences or technical journals. He has been contract professor at Politecnico of Pavia University during academical year 2001-02, teaching "Digital Electronics II". He gave several lectures at Politecnico of Milan on digital video compression algorithms and architectures.

Agencia EFE S.A.	EFE	IND

Partner Profile

Agencia EFE, as it is called in Spanish, is an important international news agency. The company is specially focused on Spain in Europe and South America in the American Continent. EFE is clearly a multimedia company, with important TV and radio departments; working with all kind of formats, text, photos, audio and video.

The history of the company started 68 years ago, in 1939, operating only in Spain and in the Spanish language. In 1965 EFE began its international expansion and today has offices all around the world, with more than 2500 users of its news services. EFE has its headquarters in Madrid and other 60 offices in Spain and abroad with smaller ones and correspondents in 150 cities spreading to 100 countries. The staff is formed by more than 1000 people and other 1000 external collaborators the 80 per cent of whom are journalists. The daily production is composed by 3000 text news in Spanish, Catalan, English, Portuguese from Brazil and Arabic, 1200 pictures and a big number of video, audio and multimedia news. Our technical infrastructure is a combination of terrestrial and satellite networks consisting of specialized newsrooms, operation and control centers, a huge distribution network hosting all kind of communication and archives including more than 15 million of text news and 2 million of pictures.

Role in SPIN

EFE is one of the main users and content providers in the SPIN consortium. With the vast archives and totally distributed network of operations, EFE is an obvious candidate for application of the technologies proposed in SPIN. EFE will therefore have a significant participation in the provision of content for testing and demonstration purposes, will collaborate in the user requirements activities and will contribute massively in the user evaluation tasks. EFE will also contribute the journalistic validation of all the interfaces involved, the copyrights issues and multilinguality Moreover, EFE as an associate member of the IPTC will promote SPIN activities and act as a link for involving the use of the relevant standards and recommendations as: the IPTC News Architecture (NA) including NewsML, NITF, NewsCodes, and IIM.

People involved

José Luis del Rey is engineer of Telecommunication for the Polytechnic University of Madrid in 1982, and Master in Administrative-Financial Direction for the Center of Management Superior Studies of Madrid in 1993. He started his professional activity in the operating area of TVE in 1977. In 1985 he was incorporated as the responsible person for the technical site, in the Informative Services of TVE in Torrespaña belonging to the Engineering Department. In 1993 he rejoined Agencia EFE as Technology Director, position that he still carries out at the present time. During this period he has collaborated with the universities of Alcalá de Henares, Navarra, UNED, Polytechnic of Barcelona, Carlos III, Juan Carlos I and Menéndez Pelayo

Manuel Fuentes Albacete Degree in Physical-Chemistry by the Universidad Complutense of Madrid in 1985.During 1987-1988, he began to develop is PhD in the CSIC Institute in Madrid to finally join an IT company, Centrisa, in 1989 as a Systems Engineer. After leaving Centrisa he was hired by Agencia EFE to take on his responsibilities at the Systems department till today. After joining Agencia EFE he specializes even more in the Information Retrieval area, where he leads the development of the text archives product, named Efedata. He worked in the past in several EU funded projects like NAMIC (2001-2002), Meaning (2004) and NEWS (2005-2006) along with other News Agencies, the IPTC (International Press Telecommunications Council) and European Universities and IT Companies.

Juan Manuel Ruiz is graduated in Telecommunication Engineering at Universidad Carlos III in Madrid, he started working for Agencia EFE in 2003. Since that moment his activity was mainly focused on Picture Systems and Solutions. He attends meetings as a member of the European Pressphoto Agency Technical Committee (epaTC). He has participated in other European project as NEWS and collaborated closely with projects involving distribution systems for Agencia EFE contents with third-party companies as Mainstream Data.

Global Information Company SRL	GIC	SME
Partner Profile	**NewsIn** is the most dynamic multimedia news agency in Romania, providing two types of information: newswires for the media and professional content for the business environment. The professional section covers three areas of interest – energy, IT&C and the financial sector along with a full coverage of the Romanian macroeconomic environment. NewsIn is the first Romanian news agency to offer a video newswire. This facility was possible after less than half a year since its launching date due to the large media group the agency is a part of. The media group is called Realitatea – Catavencu and includes several niche TV stations, a radio station, an in-store advertising network and a publishing division listing no less than 14 publications among which business, niche and generalist titles, both dailies and weeklies. NewsIn alone succeeded in increasing its product range in a very short time. Between the launching date (July 2006) and the beginning of 2007, the company doubled its products, launched a radio newswire and the video section and is on the verge of issuing a yearly publication that offers a consistent rating for the Romanian advertising market. NewsIn AdRating will be the first Romanian business magazine to rate advertising agencies and spenders according to a very labored methodology which takes into account the specifics of the local market. Regarding the above-mentioned newswires, NewsIn offers the Romanian media nine of the most requested areas of interest for the daily news: politics, economy, internal and external affairs, society, health, sports, culture and marketing. The most important news from each field is offered in mpeg format for radio stations. The NewsIn newswire also delivers an English version for non-Romanian speakers. NewsIn newswires are offered to customers on a web-based platform, available at http://www.newsin.ro. By the end of 2007, the agency takes into account the launch of a terminal that would bring business intelligence directly on the computers of NewsIn customers.	
GIC or NewsIn, as the brand name is more commonly used, has an interest in SPIN due to its fast pacing development into a multimedia news content provider. NewsIn, despite its infancy has been steadily growing and has adopted the latest technologies for the creation and distribution of news content. In this environment NewsIn finds an ideal ground in SPIN in order to advance its services introducing the social aspects in its communities of users. NewsIn will serve in SPIN providing online digital news content for testing and demonstrating the planned technologies along with assisting in the user requirements activities and user evaluations tasks.		**Role in SPIN**
People involved	**Dr. Popa** (General Manager) has a PhD. in History and strong managerial experience in a news agency. Back in 2002, he was promoted a General Manager within Mediafax (a Romanian news agency), after four years of contribution to its development. 2002 was also the year when he was distinguished by the Romanian copyright authority CopyRo for one of his history works – *The Birth of the Empire*. Mr. Popa was a General Manager with Mediafax until 2005, when he was challenged by the position of Head of External Affairs with Adevarul, one of Romania's leading daily magazines. One year later Mr. Popa was among the team to launch NewsIn – Romania's newest and most dynamic news agency that he developed both as a Sales & New Media Director and as a General Manager. **Ms. Dorneanu** (chief editor) is an experienced journalist that led the Mediafax company to success between 1998 and 2004. In 1993 Ms. Dorneanu had joined Flacara, Romania's first magazine that promoted a social attitude. After leaving Mediafax, Ms. Dorneanu was a counselor with the Romanian Presidency and in July 2006, she joined NewsIn as a Chief Editor.	

Feierabend AG	FEA	IND

Partner Profile

The Feierabend Online Dienste für Senioren AG, founded in 1999 by Alexander Wild and Harald Leyser, runs the German internet community „feierabend.de". Feierabend is information, communication and social networking on-line service company. On feierabend.de, visitors find free accessible information pages about various subjects. The registered members of feierabend, over 110.000 in Spring 2007, have access to interactive community features like chatrooms, discussion forums, personal homepages, email, photoalbums, personal set cards, friend and partner finding tools, and much more community and networking features. The usage is free of charge. Content is generated and tagged by the community. Community leaders help to organize the activities. Feierabend.de is a large social network that meets most of the Web2.0 requirements. A special feature of feierabend are the "senior scouts", selected community members who perform evaluations and test of products and services. The business model of the Feierabend AG is based on online advertisement and permission marketing.

Role in SPIN

FEA, being a huge community of users connected through a platform fully compliant with Web 2.0 technologies is the ideal test bed for the SPIN technologies. FEA will provide the experience of the targeted domain knowing the benefits and difficulties of the area which is the focus of SPIN. FEA will participate primarily in the requirements analysis activities as well as in the system validation and user evaluation tasks.

People involved

Harald Leyser (*1966) is the co-founder and CTO of the Feierabend Online Dienste für Senioren AG. For several years, he has been developing online communities and respective revenue models for consumers and corporate users. At feierabend.de, his main interest is in adapting and exploiting Internet technology to the needs of senior citizens, in particular to their specific usability requirements. He holds a Ph.D. in physics from the Technical University of Munich. Leyser is also the chief developer of the industry portal alu-scout.com.

Alexander Wild (*1966) is the co-founder and CEO of the Feierabend Online Dienste für Senioren AG (www.feierabend.de). Ever since the beginning of electronic trade using BTX and minitel technology in the 1980s, he has been working on solutions for senior citizens. Based on his pioneering work of applying the Internet as a medium for the older generation, he was among the first to develop an on-line community for users of the age of 50 and above. Wild is a consultant for 50 plus marketing and speaker at various marketing events. Beside his role at feierabend.de, he is chief editor of the Internet marketing portal www.seniorenmarkt.de.

2.3 Consortium as a whole

The consortium comprises of key technology providers, influential industry players, and leading academic institutions, as well user partners with international coverage**.** The partners include 5 separate research organisations with specific expertise in human technology interaction and participatory media technologies (VTT), multimedia content analysis (QMUL), semantic media interfaces (CWI) knowledge management (UIBK) and user centred design (HHI). Four major industrial players ensure compliance to the commercial state of the art in multimedia content analysis (TID) multimedia content discovery (AUT) robust system integration (STM) and rapid news distribution (EFE). Three SMEs ensure potential take up activities, compliance to user needs and quick adoption of the proposed technologies in: content management platforms (ATC), multimedia news distribution (GIC) and public user communities (FEA)

As illustrated in **¡Error! No se encuentra el origen de la referencia.** the consortium partners come from **9 EU Member states**. This geographically scattered consortium possesses different cultures, needs and diverse communications infrastructures and thus favours the exchange of know-how and experiences that will be most useful for the successful completion of the project.

Figure 8: The SPIN consortium

The consortium features sufficient expertise and resources necessary for success and these are integrated to form a coherent approach. The participants are committed to the tasks assigned to them and there is sufficient complementarity to ensure that all tasks can be adequately addressed. Although partners will actively contribute to all project activities especially those related to validation and business planning, their primary roles and responsibilities are summarised below:

No	Short name	Type	Country	Partners skills	Role in project
1.	HHI	RES	DE	Coordinator and expert in user centred design	Coordinator and leader of WP2 User-Centred Design
2.	VTT	RES	FI	Research organisation expert in Human-Technology Interaction and Media research	Leader of WP4 Prosumer Communities and contributor to the User Interaction design activities
3.	TID	IND	ES	Major service provider and expert in multimedia analysis	Leader of WP5 Semantics in Social Media
4.	QMUL	RES	U.K.	Academic with a long track record in semantic content analysis	Leader WP3 Semantic Structuring and Characterization
5.	AUT	IND	UK	Worldwide market leader in search technologies	Contribution to distributed media searching, design and exploitation activities
6.	UIBK	RES	A	Research organisation – expert in knowledge engineering and social semantics	Contribution to activities related to social profiling and collaboration
7.	CWI	RES	NL	Research organisation expert in semantic media interfaces	Key contributor to WP4 Prosumer Communities and user interaction activities
8.	ATC	SME	EL	SME with commercial activity in media content management applications	Leader of WP8 Dissemination and Exploitation and with significant participation in integration activities
9.	STM	IND	IT	Worldwide industrial leader in semiconductor technologies and multimedia encoding implementations	WP6 System Architecture and Integration
10.	EFE	IND	ES	Major news agency based in Spain but with international coverage	Content and requirements provider with contribution in interoperability activities
11.	GIC	SME	RO	Fast growing news agency early adopter of online multimedia content distribution technologies	Content and requirements provider with contribution in distributed media tasks
12.	FEA	SME	DE	Large community of users hosting an online platform with web2.0 technologies	Relevant platform provider, leader of WP7 Demonstration and provider of potential users\communities

2.3.1 SPIN genesis

Cooperation between SPIN partners dates as back as FP5, where TID, HHI and QMUL collaborated in the BUSMAN project (led by the latter), which already worked on multimedia structuring and access to video databases. Work related in part to SPIN objectives expanded in FP6, where QMUL and TID work in aceMedia on knowledge-based processing of multimedia; QMUL, CWI and TID work together in k-Space on semantic inference for automatic annotation and retrieval of media; QMUL, ATC and TID collaborate in MESH (led by TID) towards semantic understanding of multimedia news content; QMUL and UIBK work together in EASAIER dealing with music and audio content; and recently QMUL, ATC, TID and HHI have started to develop a video search engine in RUSHES (co-ordinated by HHI). Social media took momentum during this period, and SPIN partners saw the impact to apply their expertise in media understanding and merge with advances in social networks and the emerging "prosumer" role. To that aim an additional set of partners joined the consortium, including VTT as leader in social media research (and with past work experience with HHI and TID in the USINACTS project). Autonomy, a close partner of ATC, joined as expert in information management, and AIKB supplied their leadership in conceptual modelling and lightweight ontologies. STM as system architect and software integrator completed the set of industrial partners, and the consortium was finalized with the incorporation of organisations linking the technical work to both professional users and general public (EFE and GIC) and online communities (FEA).

2.3.2 Sub-contracting:

Not applicable.

2.3.3 Other Countries:

Not applicable. All partners are based in EU Member States.

2.3.4 Additional Partners

Not applicable. All necessary expertise and resources to carry out the planned objectives resides in the partners of the consortium.

2.4 Resources to be committed

The SPIN consortium will mobilize the critical mass of resources (personnel, equipment, and finance) necessary for the successful completion of all the objectives of the project. HHI will constantly, as the project co-ordinator, monitor and report the utilization of the project's resources, providing the required support and contingency actions in cases of variations.

Personnel

The SPIN consortium features the necessary expertise required in the project. The Consortium consists of experienced technology providers (TID, STM, AUT, ATC), leading academic and research institutions and centres (HHI, VTT, CWI, QMUL, UIBK) and user partners (EFE, GIC, FEA) from diverse business domains that bring significant expertise and knowledge in the project.

Highly qualified and experienced personnel from the participating organisations will be involved in the project and contribute to its successful completion. While the respective average salaries have been calculated in the project labour costs, the following two graphs show the distribution of allocated person months per partner and per workpackage.

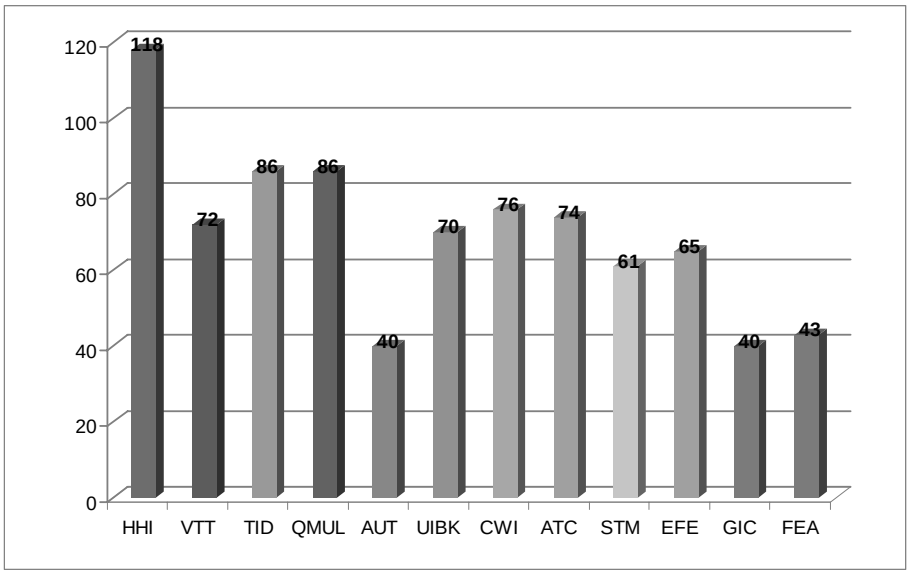


Figure 9: Person months allocated per partner

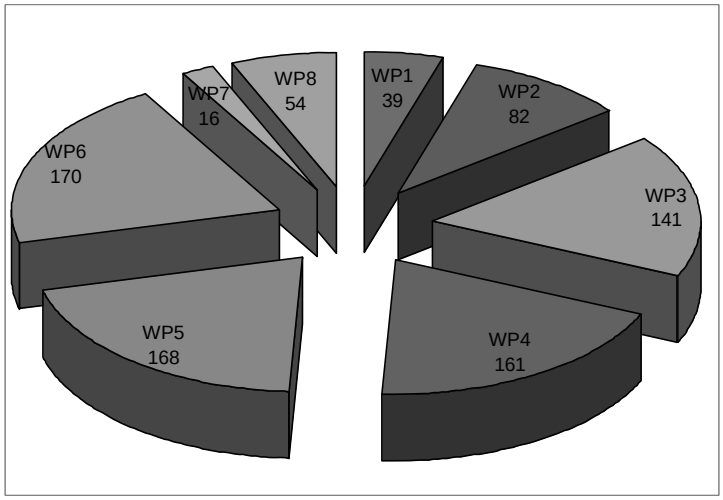


Figure 10 Person months allocated per workpackage

Financial Resources

The precise financial information for the SPIN project is given in the submitted A3 forms. However, in order to better illustrate the main financial aspects of the project, we have provided a number of graphical representations of the key financial indicators, which are representative of the resources required for the realization of the SPIN objectives and vision.

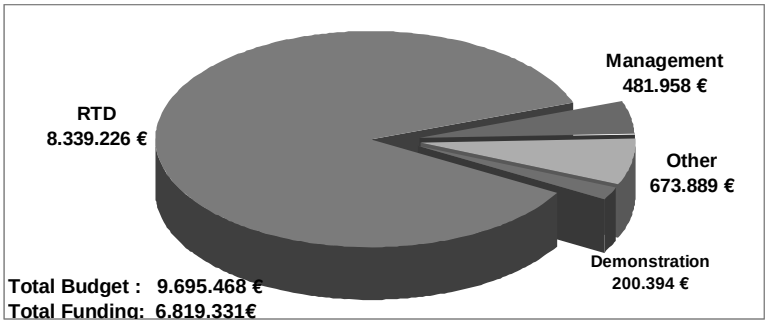


Figure 11 EU contribution per activity type

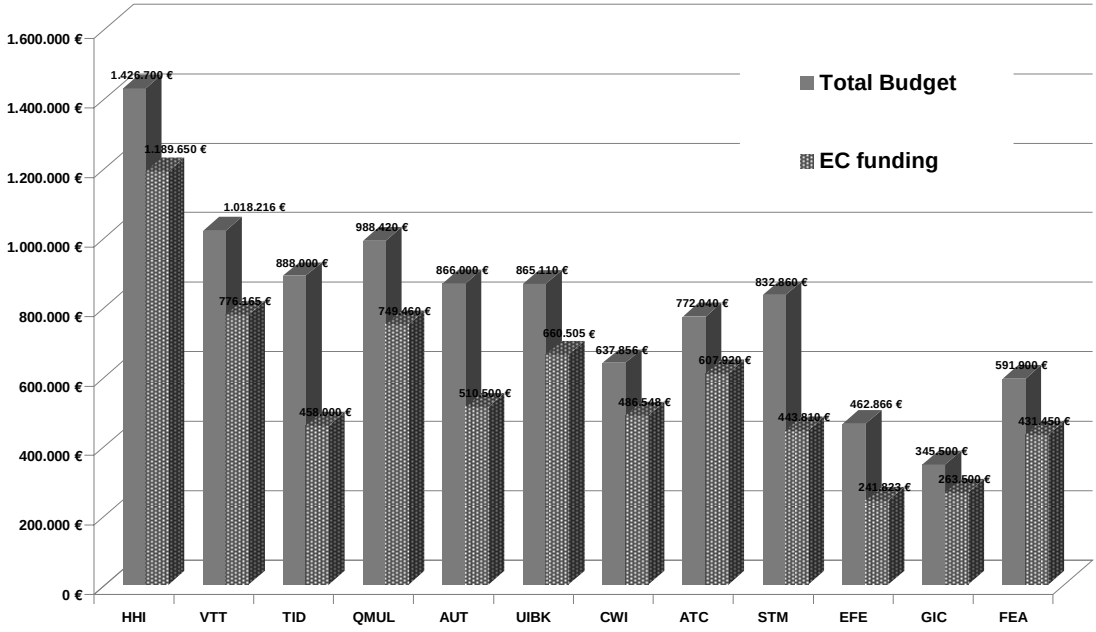


Figure 12 Total budget and EU contribution per partner

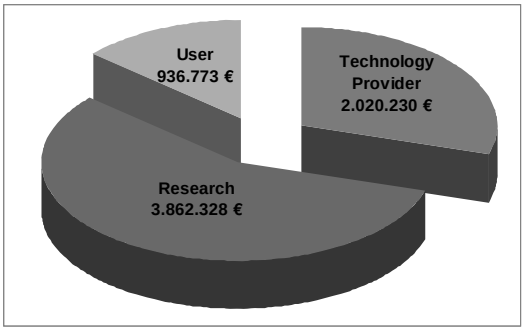


Figure 13 EU contribution per type of partner

Section 3: Impact

3.1 Overall Impact in the Sector

SPIN has the potential to vastly impact the multimedia industry and strengthen European competitiveness in the Intelligent Content and Semantics area. At service level, this project focuses on distributed delivery and efficient sharing of and access to prosumer generated content. Progress in this field will be a crucial factor for the uptake and deployment of interactive digital services in Europe and beyond. Thus, SPIN will support the European media sector as a whole in mastering the challenge of considerably improving the technological base of business around social media. European companies active in this area will benefit from the know-how and best practice solutions generated by SPIN. This will improve delivery chains and workflows in the media industry and for those individuals working within it. Even more important, prosumers will experience a whole new range of affordable services in a seamless way. SPIN will allow for the wider deployment of content that empowers the citizen to get in-depth access to media information created by fellow citizens and professionals in the media sector. The project will deliver solutions for broadcasters, Internet service providers, professional content providers and SMEs, enabling added value socially networked media distribution while remaining compliant to existing standards and interoperability on a variety of platforms. Characteristics of news are a stable underlying knowledge structure, but rapidly adding content. This is very different from cultural heritage, where addition of new artefacts is slower and much effort is spent on the change management of the underlying thesauri. Consequently, SPIN addresses the necessary organisational structures and methods of work, which allow for a smooth integration of advanced solutions. SPIN furthermore focuses on the creation of a sustainable social content and knowledge infrastructure by facilitating access to dispersed information.

Societal: SPIN enables business models based on social media. This will make information available for people from their usual, well known and trusted web-sites. Inexperienced users will trust video recommended through, e.g., EFE's or Telefonica's web server, even though the video is physically streamed from some other party. Inexperienced users will thereby access and use media they would otherwise not find and use. This will lessen the threshold for using audiovisual content for large groups of users and thus increase the volume and revenues from streaming media. Special interest programmes for minority groups of any disposition will be able to make one web site as the trusted portal for its user, but serving the users audiovisual content from several relevant audiovisual databases. Finally, by making a better use of community knowledge, SPIN provides a potential solution to the digital divide between urban and rural areas.

Standards: SPIN will utilise and suggest additions or improvements to existing open standards. Due to the openness of SPIN, it will contribute to impeding the European media market to be controlled by a small number of manufacturers and content providers which own and use proprietary interfaces. Many European companies do not have the resources and power to establish penetrate the market with their own solution. For that reason, the SPIN consortium will endeavour to influence standards developments as much as possible. Members of the consortium are already actively involved in disseminating the results of their research fields and their own research via W3C, and will continue to do so.

Industrial: SPIN not only provides solutions for professional content providers and producers, it also neatly addresses the issue of sharing and augmenting personal content. The project intends to build and leverage the technologies that are key factor to the development

of efficient usage of social media. SPIN will boost the user's desire to buy and consume digital devices and services.

SPIN has the potential to vastly impact the business of media content providers, telecommunications and Internet service providers. The service-oriented architecture of SPIN's system approach allows support for innovation in several business models. Media content providers will benefit from increased competition among suppliers offering SPIN enabled products. Since the market for these products will increase compared to the market for system components dedicated to media production and distribution for a specific business model, higher reliability and robustness of these components is expected. Automated metadata generation and for prosumer enabled system components will lead to reduced media production cost.

The media value chain begins with the creation of (prosumer) content, e.g., bloggers, special interest social networks, etc. Companies which do not have an exclusive content sales channel will be able to distribute their programme through a SPIN social network, and thereby helping the SPIN based network to succeed. Telecommunications and third party service providers will benefit from media structuring technology developed by the SPIN project. To ensure co-evolution of technology and applications so that advances are exploitable in innovative products and services, particular attention will be paid to market prospects, users' needs and usability and accessibility of technologies and applications.

SMEs: SPIN will enable small content owners and aggregators to launch services to a wider audience and lower costs. The technology the project represents will make it possible to introduce compelling services with fewer resources. It will also enable niche content owners to reach more end-users and evolve new markets and business models as well.

Since the nature of SPIN is so distributed it will allow many different implementations of the technology. It covers a wide range of technology from media structuring, summarisation, aggregation and distribution to overall content management in a complete value chain. This will open new markets for SMEs in the different technology segments of the project.

3.2 Contributions towards expected FP7 Work Programme Impacts

There are four expected impacts listed in the work programme in relation to the ICT FP7 Objective 3.4.2.1: Intelligent Content and Semantics. In this section, for each expected impact, the steps that will be needed to bring about these impacts are outlined. Furthermore, it is briefly explained why this contribution requires a European rather than a national or local approach. Finally, it is indicated how account is taken of other national or international research activities.

3.2.1 Impact 1

Creators will be able to design more participative and communicative forms of content

How will SPIN contribute towards this impact? SPIN's impacting contribution towards the creation and design of more participative and communicative media can be seen through social media as a means of wide and participative communication. In SPIN multimedia content is shared with the intent of informing others, to show one's own feelings, to commit oneself to something, or to provoke an action. However, these communicative acts can only be successful, if the respective messages are able to reach their target audience. SPIN will enable access to the required social connections. Since content will find its way to the proper

receivers through metadata matches, a Semantic People Information Network will give content creators the opportunity to design more communicative content. Furthermore, the participative features already present in social media in the forms of voting or view count based ranking will be complemented through social tagging and relevance feedback. Thus each community member will be able to participate in a process that causes the semantic metadata associated to a given piece of content to evolve towards more appropriate semantic descriptions. That is, SPIN is indeed designing more participative and communicative content.

SPIN will build on two important trends: user-generated content and social networks. Users have learned to utilise digital content creation tools and services to share their content with others, and social networking features to connect with others with similar interests. This development is still in its early stages and there is a lot of potential to develop new tools and services that empower users to create new types of interactive content and create and share media experiences with others. In order to make these new kind of media experiences possible, new tools and processes are needed to help in adding semantics and structure to content and aggregate small granular inputs into larger coherent and engaging aggregations.

SPIN includes personalisation into this participatory content creation and consumption environment. Here the concept of a social profile manager plays a key role. The profile manager will be able to learn from user and community actions and will support both metadata and content creation and consumption. The profile manager will be made in a way that supports openness and reusability in different applications. The SPIN consortium has partners with extensive experience of user-centered design. It is crucial to the success of the technology to be developed that it will be accepted by end-users. The project will involve users both by utilising traditional user studies and engaging users with into active and longer term collaboration by deploying social media tools and processed for interactive participation.

Steps that will be needed to bring about this impact: SPIN technology will dilute the barriers between professional users and laypeople, enabling this latter group to enter the content production chain in an improved position. The influx of user-generated content will then substantially increase, with the added value that this content will be much better prepared for widespread distribution.

The most important step needed to bring about impact in the provision of participative and communicative content is inherent to the social nature of the project. Succeeding with SPIN at technological level is the only requirement and step needed to realise the vision of more participative and communicative forms of content.

3.2.2 Impact 2

Publishers in creative industries, enterprises and professional sectors will increase their productivity with innovative content of greater complexity and ease of repurposing

How will SPIN contribute towards this impact?: To "*support production of novel forms of multimedia content of greater complexity and ease of repurposing*", SPIN's concept of semantic and social media appears to be answer. Since SPIN targets the future of social media embodied by "prosumers" its potential impact in this area is also manifold. It will pave the way for new means of access to currently still disorganized social media and it will allow use of vast resources of community tags. However, while the digital age is blooming, users are suffering for the uncontrolled growth of unstructured raw content and the fact available content cannot be easily repurposed. SPIN has vast potential to impact productivity and revenue growth of publishers and enterprises allowing greater accessibility for a range of

content providers by merging together knowledge by data mining into social tags and formal knowledge structures obtained from the semantic processing of the content.

In the same context of "*supporting the production of novel forms of multimedia content of greater complexity and ease of repurposing*", SPIN does not only provide solutions for the overall community it also considers professional content providers, and neatly tackles the issue of personal content sharing. If funded, SPIN will greatly contribute to foster social networks to ease the re-use of available content.

Currently News Agencies are very reluctant to incorporate information coming from their users' communities into their products, because of source reliability, prestige and/or big customers' requirements. Meanwhile some online newspapers, radio and TV are already a step ahead. News agencies have to reduce this gap but they should use a more professional approach. SPIN will help to make this transition more trustworthy. The initial use of the contributions coming from EFE's regional bureaus, which are closest to this idea already in their daily tasks, will help to succeed the project.

Information and news professionals will also find enhanced work areas. Their role will evolve in many cases, from pure information producers to compilers of third-party information, adding value by improving understandability and providing informed opinions by selecting and repurposing media. The workflows of mainstream content and user content, now sharply divided within information-processing organizations, will be effectively blended. Thus, SPIN is at the centre of productivity with innovative content of greater complexity and ease of repurposing.

Steps that will be needed to bring about this impact: An ultimate goal of SPIN is to enable automatic combination of distributed pieces of knowledge contained in multimedia files into higher units and thus provide ready-made information for users. The main steps needed to bring about this impact are:

- Using behaviour of people in online social networks and their influence in information management to harvest additional knowledge about the information they interchange, and about new possibilities to make use of media and services.
- Content intelligence will enable automatic arrangement of items into publication structures.
- The system will be transport-agnostic, so that the semantic foundations can be built on top of already existing community networks. The use of semantic coding will improve efficiency in the propagation of content.

All and each one of these individual steps are specific objectives of the project. The realistic, unified and novel approach proposed in this project is expected to bring solutions in the short and medium term. As a consequence it is also expected that relevant modules implemented during the 36 months of project life will lead to an immediate manifestation of this impact.

3.2.3 Impact 3

Organisations will be able to automate the collection and distribution of digital content and machine-tractable knowledge and share them with partner organisations in trusted collaborative environments

How will SPIN contribute towards this impact?: SPIN will contribute towards this impact by allowing multimedia content to be tagged with information about semantic structuring and characterization. The content will be then retrieved by interfaces and systems for media query, navigation and creation tools that will select the best match via semantic context matching for

media items, and then perform intelligent content adaptation and delivery. SPIN will target the prosumer communities addressing the issue of trust, privacy and copyright.

A major objective of SPIN is to provide a unified system for bridging the worlds of social media and media semantics research. Consequently, SPIN implicitly aims at providing the tools for dynamic multi-level personalization, intelligent sharing of content, and linking prosumer generated content to mainstream media. The successful realisation of the SPIN concept will lay the foundations for increased industrial competitiveness by enabling European organizations to initiate an important shift in the way in which digital content is created and consumed as opposed to yet another incremental advancement of the current state of the art. This will be achieved by realising the social network concept that assists in fulfilling users' real expectations and needs. Central to the social network model is the existence of formal knowledge structures, mapping of readily available social tags and user-oriented media contexts into the SPIN social net. This solves two key issues in the automatic sharing of media content.

Firstly, content creation, processing, delivery and access is made very simple from the user's viewpoint, which in turn encourages them to act as prosumers in their day-to-day activities.

Secondly, it provides benefits in terms of boosting new applications in various sectors affecting European organizations in general including large and small businesses.

SPIN will emphasize interoperability between software and computing technologies and interoperability to allow adaptation to new applications and services. This will be achieved again by formalizing a novel computationally-tractable approach for the automatic generation of semantically rich, social-driven content.

Furthermore, SPIN focuses on the creation of structured appealing content and knowledge infrastructure by facilitating access to row, dispersed, community tagged and unexploded information. This is another aspect that will have significant impact in European organisations by enabling them to automatically organise information into publishable structured content and distribute it through trusted collaborative environments made up by clusters of users in online social networks.

Steps that will be needed to bring about this impact: This impact will be brought about in three partially concurrent steps:

The first and fundamental step is R&D of the key technologies underpinning the work plan in this project: User centred analysis of SPIN requirements (WP2); Semantic structuring and characterization of prosumer generated content (WP3); Prosumer communities and semantics in social media (WP4&WP5)

This step is concurrent to an intensive SPIN system architecture and integration phase followed by a thorough validation of the SPIN concept over the proposed system and tools (WP6). This second step will be achieved during the project life and demonstrated according to the activities specified in the project work plan (WP7).

The final step will start during the life of this project but will extend beyond the 36 months funding. It will consist on replicating the SPIN modules and tools, making the technology available in commercial form. This step will be initially driven by the market analysis performed during the project and it is expected to lead to the large-scale penetration of SPIN technology in the sector. After that it is also expected the emergence of new related markets and business models.

3.2.4 Impact 4

Scientists will operate more efficiently by automating the link between data analysis, theory and experimental validation

How will SPIN contribute towards this impact?: The creation of novel forms of interactive and expressive content, while achieving selective access and easy share, through structuring and characterization by exploiting social driven tagging and personalization aspects of individuals or interest groups, has also a huge potential of impact on the scientific community. SPIN advances current information retrieval and delivery systems introducing a formalized structure to prosumer content and semantically reach social tags. As such SPIN provides a solid test-bed for scientists to intelligently merge distributed source of information while integrating heterogeneous media data, querying and managing data across different platforms and media, dynamically and interactively packaging and repackaging media data according to different requirement, intelligently generating meaningful and interesting results based on embedded semantics, testing and optimising different algorithms, advancing multidisciplinary technologies, and validating experimental assumption, as well as, proofing the underlying concepts.

SPIN opens a fascinating space for researchers to experiment with existing technologies, discover new methods, contribute and advance the state of the arts in multimedia creation and processing. More importantly it links human sciences and engineering under a common concept to ultimately serve individuals and communities in everyday aspects of work and entertainment.

Steps that will be needed to bring about this impact: Since SPIN involves R&D to a large extent it will be important to address and involve the international scientific community to being about this impact. This will enable exploitation of complementary expertise and synergies and thus, help to automate the link between social sciences, data analysis, theory and experimental validation. In this context, an important step to bring about SPIN impact to the scientific community consist of reaching out and disseminating results through various scientific events and publications. The launch of scientific awareness to the world will not only get the valuable feedbacks and recommends from various domain experts but also trigger world-wide attention to the effort of SPIN. This bilateral benefit can lead to efficient and productive international scientific collaboration.

3.2.5 Need for a European Initiative

On several aspects, SPIN impact relies on a European approach. From the perspective of validity it will be beneficial if stakeholders from different countries are able to utter their requirements, so that local practices of producing, sharing, and taking up of information can be leveraged by SPIN technology. Also from tests with localized components to be run on different partner sites hints will be gained as to whether language and culture differences can lead to different semantics emerging from social tagging. Such information will be needed to devise solutions for transnational social networks that hold no barrier for the participation of individuals from different cultural backgrounds. Here, clearly and European approach is required.

Moreover, SPIN-like solutions, even if it would be possible to develop them drawing upon localized expertise only, most likely would not cross local or national borders. Therefore experts in the fields of semantic analysis, social networks, content management and human factors from all over Europe are needed to combine forces and later to individually inject the

developed solutions into their respective national arena. This will be made possible for the project results to spread from several pan-European "points of infection" to the wide world.

Europe is internationally recognized for the excellence of its talents and skills in digital media production. By achieving intelligent processing, sharing and easy access to a vast amount of media form both professional and user oriented resources, SPIN will increase the cost-effectiveness of production and raise the emphasis, making it possible for the European production industries, news agencies to remain competitive as well for the users to distribute their resources. This goal could not be achieved at national or local level.

Finally and more importanlty, the social online community spreads across nations and is less relevant at local level. The multilingual and multi-cultural features in Europe provide interesting data and use cases for the project as well. By essence critical aspects of SPIN are multinational and as such must be tackled at concerted international level.

3.2.6 Account of other Research Activities

The partners of the SPIN consortium have been selected for their research and commercial excellence as well as for the experience they possess from past and present participation in relevant initiatives and/or commercial activities. The most relevant activities from which experience will be transferred and synergies will be sought, are listed below:

Related FP6 Projects	**Project results that may be reused or extended by SPIN**
ACEMEDIA	M-OntoMat-Annotizer, ontology framework, content sharing
BOEMIE	Technology for ontology learning from multimedia content
Content4All	Research on roles and user behavior patterns
K-SPACE	K-Space framework for the support of annotating audiovisual media
MESH	Personalisation infrastructure, multi-modal semantic charaterisation, content syndication
REVEAL THIS	Cross-media categoriser, cross-media indexer, textual and visual summariser and cross-lingual translator
RUSHES	Querying and retrieval techniques using hierarchic descriptors, interfaces for media query and navigation
SALERO	Multimedia representation framework and ontologies
SEKT	Ontology management infrastructure; ontology mapping language
SEMEDIA	Query interfaces that integrate secure access and rights management and usage-based annotation and feedback models for multimedia objects
VIDI-VIDEO	Technology and tools for the automated analysis of speech, audio and visual information
VITALAS	Interactive indexing and semi-automatic annotation techniques
X-MEDIA	Techniques for representing and managing uncertainty, trust and provenance

3.2.7 Impact and Relevance to Challenge 4: Digital Libraries and Content

The overall concept of SPIN is directly aligned to main aspects of the ICT challenge 4 as stated in the work programme for FP7:

"*The challenge is to harness the synergies made possible by linking content, knowledge and learning; to make content and knowledge abundant, accessible, interactive and usable over time by humans and machines alike. This should take into account current trends in content production and consumption and particularly the move from few-to-many to manyto-many models.*

The support of more personalised and collaborative services, particularly within selforganising communities, will lead to more creative approaches to content and knowledge production."

The social media trend and challenges addressed by SPIN are originated by the need to link prosumer generated content with knowledge and learning. This trend seems to be endless and fuelled by technological breakthroughs. SPIN, whilst bringing new technology and social driven multimedia services to everyone, addresses key issues in the next generation of multimedia systems where societies, professionals and end users amalgamate in a single workflow for production, processing and sharing of media. As such SPIN is not only at the hearth of the ICT challenge 4 but also set to significantly impact the way digital media is consumed and produced.

3.2.8 Relevance to Objective ICT-2007.4.2, Intelligent Content and Semantics Area

The main objective of the Intelligent Content and Semantics area is to:

> "*make digital resources that embody creativity and semantics easier and more cost-effective to produce, organize, search, personalise, distribute and (re)use, across the value chain.*".

The overall objective of SPIN is:

> *"To bridge the worlds of social media and media semantics research, facilitating multimedia sharing of current content through the use of knowledge and semantics."*

Clearly, this main project goal is directly aligned with the objectives of the thematic area *ICT-2007.4.2*. SPIN will enable mechanisms for the realisation of this strategic objective allowing Europe to become a leader in important applied technologies central to social media. The successful implementation and validation of the SPIN ideas and its overall vision will result in clear scientific advances in the field and will provide the foundations for increased industrial competitiveness in this sector. The project will demonstrate how these benefits will accrue to future users of the technology developed.

Two specific target outcome of the objective *ICT-2007.4.2* are:

- *Collaborative automated* ***workflow*** *environments to manage the* ***lifecycle of novel*** *and legacy media and enterprise content assets, from the acquisition of reference materials to the versioning, packaging and repurposing of complex products, including their linguistic and cultural adaptation to target markets and user groups.* ***Empirical results from the psychology of human perception and attention will be used to identify salient multimedia segments and apply summarisation and encoding schemes that will improve content storage and transmission without affecting its perceptual*** *properties.*

- *Architectures and technologies for **personalised distribution, presentation and consumption** of self-aware, adaptive content.*

SPIN envisaged outcomes overlap to a great extent with these two target outcomes of FP7. Furthermore SPIN approach is based on user-friendly interaction between humans and digital services together with a "Design for All" philosophy in the different activities of the project. The use centeredness of SPIN will ensure that user expectations are met and the ICT objectives in this specific area are kept at the centre of this project. The provisioning of technology such as shared distributed information and content sharing and retrieval available on demand and tailored to user needs will obviously result in more efficient services. Overall the project proposal fits ICT's declared purposes, namely:

> *"...to help to create a user-friendly information society by building a global knowledge, media and computing space."*

SPIN combines research on the psychology of human perception and attention, human factors and human computer interaction, social networks, semantic-driven media analysis and ontologies to promote easier communication and information access everywhere. The above mentioned objectives of the "intelligent content and semantics area" are addressed in all the R&D aspects of the project.

3.3 Dissemination, Exploitation and Management of Intellectual Property

3.3.1 Dissemination and Outreach

In addition to the jointly dissemination activities planed in WP7 and WP8 of the SPIN work plan, the consortium partners are aware of the need for individual targeted contributions to dissemination and outreach. The following paragraphs detail statement of SPIN partner with respect to their dedicated dissemination efforts

Fraunhofer is a large public non-profit organization with 56 research institutes in Germany with an emphasis on applied research. Fraunhofer HHI with its Interactive Media – Human Factors Department pursues research and development of innovative concepts for multimedia communications of the future. Since a major portion of its research and development is conducted on contract on behalf of the industry, important dissemination channels are fairs and exhibitions such as CeBIT, Hannover Messe or IFA, where products or prototypes based on HHI research are regularly presented. Results are also published in workshops, conferences, books and journals

VTT is a technical research centre with both academic and industrial ambitions. VTT has close relations to industrial companies. VTT publishes its research results in multiple ways including conference and seminar presentations, scientific and trade magazine articles and by publishing in its own publication series. These publications will be available at the VTT web site. Where possible, VTT will use open innovation methods: prototypes and ideas are opened for discussion with people and parties with particular interest in the applications in question. VTT's Open Web Lab (Owela) can be used as a tool there.

TID is part of the Telefónica group, and among its company objectives it has the mission to disseminate advances and opportunities in information society, both inside the group (using corporate channels) and outside (using regular publication channels, as well as Telefónica's own means, such as corporate edited journals, information society portals and press releases). This dissemination channels will be used to present SPIN objectives, results and expected impact, and create awareness on the project.

Being part of an academic institution, The MMV group at QMUL are also keen to advance their reputation by publishing their research work and undertaking consultancy. The knowledge gained from the project will ensure that the content of QMUL's final year degree courses and its postgraduate courses is kept abreast of current and forthcoming developments in the Multimedia area. In particular, the Department has set up new courses in Interactive Media Design and in Multimedia Systems Technology. These two courses are well-placed to disseminate among MSc students cutting-edge technological results of SPIN. QMUL frequently organises and contributes to major international conferences, research journals and publishes books on Multimedia. These activities will be also used to disseminate the results of the project.

Standards in the area of semantically enabled knowledge technologies are chiefly being determined by the World Wide Web Consortium (W3C), of which CWI and UIBK are members. CWI heads the W3C Benelux office, houses the W3C Semantic Web Activity Lead and co-chairs the Incubator group on Multimedia Semantics. UIBK is heavily involved in the OWL standard, and participates in the W3C interest group on "Semantic Web Best Practices" and activities on semantic web rule languages. Furthermore, UIBK positions itself in the Semantic Web Services area and is proactive in the W3C Semantic Web Services interest group.

UIBK organizes an annual industrial event called the European Semantic Technology Conference (http://www.estc2007.com/). It is a new European meeting ground for customers, developers and researchers to discuss the applicability and commercialization of semantic technologies in corporate settings. It can serve as one of the dissemination points of the project. It organizes leading conferences on the semantic web, such as International Semantic Web Conference, European Semantic Web Conference, Asian Semantic Web Conference. UIBK also coordinates Knowledge Web (the Network of Excellence on Semantic Web). The main objectives of Knowledge Web are outreach to industry, education and research which can provide ideal dissemination channel for the project.

CWI is actively involved with IPTC in the development of News standards on the Semantic Web (http://newsml.cwi.nl) and is currently working with members of IPTC (International Press Telecommunications Council <http://www.iptc.org>) on these issues. Results of the project will be highly relevant to this body.

CWI, VTT and HHI are members of ERCIM - European Research Consortium for Informatics and Mathematics, which aims to foster collaborative work within the European research community and to increase co-operation with European industry. Dissemination of results takes place through ERCIM contacts and through the ERCIM news which is widely distributed to industries in Europe. ATC will disseminate SPIN project results through active participation in the dissemination activities planned by the consortium such as contribution of resources to web project presentations, paper materials (brochures, white papers etc.) user group conferences, and seminars. Internally, the project results will be disseminated through the development and integration teams that will be working on the technical implementation of the new technologies both for the SPIN Platform as well as with the integration of those technologies with ATC’s own software solutions. As a provider to national and local TV Broadcasting Networks in Greece, Portugal and Cyprus, ATC will make use of its distribution channels to raise awareness of the SPIN project and to get feedback from these and other customers for future incorporation of the results in their own operations.

Advances System Technology group of STMicroelectronics is a system R&D organisation, that has, as part of its mission, the goal to publish in technical journals and conferences the results of its research,to benchmark the relevance of them as state-of-the art developments. Towards this end, AST published each year tens of scientific publication in the multimedia

field only, not to mention all the other technical fields. AST has, as the other part of its mission, to disseminate internally within all product division the results of its research.

As an international News Agency, Agencia EFE will disseminate the evolution and the final outcome of the SPIN project in the circles where EFE is currently a member, like the International Press Telecommunications Council, IPTC, whose most active members are big News Agencies, Newspapers and TVs and which meets three times a year a deals with standardization in this media. Also we will closely inform about the project to the European Pressphoto Agency, EPA, whose technical committee meets twice every year and EFE is one of the most active members. Some Spanish Universities which usually collaborate with EFE like UC3M, UNED, UPC. Journalists obtaining their Masters Degree at the Universidad Juan Carlos I. Spanish IT companies which provide solutions to EFEs needs. UNED will communicate the results in the Cross Lingual Evaluation Forum (CLEF) and Text REtrieval Conference (TREC) meetings.

3.3.2 Commercial Exploitation

SPIN will deliver a flexible framework that invites exploitation by a number of diverse communities and industries. Our aim is to encourage wide use of the technology. In order to ensure effective, seamless and timely exploitation, SPIN partners have dedicated exploitation plans, which clearly vary between the different types of organisation within the consortium. Exploitation of research is now seen as a crucial and valuable part of the work that universities and research institutes undertake, therefore, this sub-section not only includes exploitation plans for industrial partners but also for some of the participating research institutions.

Fraunhofer HHI will follow three main exploitation paths. Firstly know-how and intellectual property gained from the SPIN project will either be licensed to customers or directly converted into a marketable product. A recent example of the latter strategy is a photo-browser for handhelds featuring similarity-based image sorting and search. For promising products demanding a high workforce to manufacture and market, spin-offs are a further option that has already been successfully chosen in the past. Secondly gained know-how, especially in the field of human-centred design, will be used for consultancy, and thirdly, in order to keep open and to strengthen the first two exploitation paths, such know-how will be fed back into and increased by further publicly funded research on the regional, national and European levels.

VTT Technical Research Centre of Finland is an impartial expert organisation and the biggest contract research organisation in Northern Europe. VTT provides high-end technology solutions and innovation services. VTT objective is to develop new technologies, create new innovations and value added thus increasing its customer's competitiveness. With its know how VTT produces research, development, testing and information services to public sector and companies as well as international organisations. Through its international scientific and technology network, VTT can produce information, upgrade technology knowledge, create business intelligence and value added to its stakeholders. VTT has extensive contacts to companies acting in the media creation and distribution value chain including system and handset providers. The knowledge and IPR created in the SPIN project may be utilised in product development which aims at creating new value-adding products and services to the quickly growing area of media applications where users are actively involved in creating and driving the applications. The work to be done in the SPIN project deals with the issues and areas that have been identified as key areas for technology development at VTT.

Telefónica's multimedia services over ADSL networks are one of its fastest growing business areas. Here the company is moving from a simple network connectivity supplier to a complete service provider, as a means to enhance its revenue base. As such, the outcome of the SPIN

project will provide Telefónica with the technology to enhance the portfolio of services offered through this network, specially considering content sharing networks, user communities and user-generated content. Additionally, one of the objectives of the company is to offer integrated services across all networks, and to that aim SPIN capabilities will be used to link together STB-based fixed access (through ADSL), Terra (Telefónica's Internet portal, already deploying community tools) and the mobile network.

Another exploitation area will be in the creation of personalised services for communities of interest, for which subscription-based business can be deployed. This will target corporate customers, professionals and general users.

Finally, a number of complementary services around SPIN technology, such as advanced subscription-based content servers or semantic analysis engines for personal content ser could be provided by Telefónica or its associated partners. Enabling end-users with means of creating and sharing their own content will increase the demand for high-speed network access, and therefore Telefónica's customer base.

Queen Mary University of London conducts contract research and development projects in the areas of multimedia processing, information and communication technology. The costumers are a broad range of industrial, commercial and public service organizations in the national as well as the international market. Its combined scientific and technical capabilities will be instrumental in the realization of the SPIN vision. The technology targeted in the project and the competence developed in the project will improve their abilities to serve EU society and increase the competitiveness of EU and national industries. QMUL has a well-established exploitation office. This has already led to a number of initiatives including the formation of a spin-off company based on the work of a recent EU-funded IST projects (IMPACT, BUSMAN and aceMedia) within the Department of Electronic Engineering. QMUL will also exploit the results from SPIN in its consultancy activities. QMUL will use its experience in this IP to support co-operation with local industries and develop experts for companies interested in SPIN technology.

Autonomy already has applications and a client base of customers who need structure for their information, including audiovisual material. The ability to federate such information with other external repositories and using social networks will enhance the product range that can be offered.

Building on its strong experience and products in the media sector, ATC will expand its product reach through the incorporation and support of the media technologies developed in SPIN such as incorporating the indexing and automatic retrieval of multimedia content. These innovations will be available to new and existing ATC customers and will assist the companies' efforts to expand its customer base, while differentiating from the competition. The media sector is highly competitive in the digital asset management space, with little separating the functionality of the offered solutions. The developments of SPIN will show ATC's commitment to delivering cutting edge solutions through R&D and other product development initiatives. ATC will also leverage its extensive commercial experience in the media sector to assist the other project partners in joint exploitation of the results of this project.

As part of its strategy to remain a leading semiconductor supplier for the consumer home and mobile terminal, ST will continue researching in the field of multimedia, and in particular focusing on social networks sharing A/V content and on user generated A/V content creation, search and distribution, as these are innovative ways to use terminals such as portable devices, multimedia players/servers where STM has significant market presence. STM aims at being able to enhance its product offerings with implementations of the results of SPIN activities in order to make its offering capable of supporting such social usage at an optimal consumer

price point, exploiting STM ability to introduce highly integrated silicon devices in the market. This will allow bringing to the mass end-user market the technological results of the SPIN research project in the shape of “SPIN-enhanced” multimedia terminals (mobile phones, camera, set top box/media servers). Exploitation may include introduction of new chipsets/System-on-Chips which benefit from the research results, or integration in current products of the IP emerging from SPIN.

EFE’s own development team that will take care to incorporate the relevant modules and ideas of SPIN into our current business model. Of course EFE expect it to be rather gradual, and it will never completely replace our currently running applications. For a commercial exploitation for current non-EFE customers, EFE will have to rely on third companies, due to the fact that at the moment, EFE does not commercialize or support turn-on-key products directly. But EFE has a good number of companies willing to do so in the case that the outcome of the SPIN project is interesting for other users.

3.3.3 Management of Knowledge, Intellectual Property, and Innovations of SPIN

Protection for partners' background knowledge will also be provided by use of confidentiality clauses in the Consortium Agreement. A non-disclosure agreement is already in place between all twelve SPIN partners, which ensures confidentiality of information exchanged so far. In addition, partners' relevant background IPR will be declared at contract stage, and licenses for its free usage within SPIN will be required. Partners will also be obliged to licence on fair and reasonable terms, any background which they own which is necessary for exploitation of the foreground IPR developed in SPIN.

In order to provide for exploitation opportunities for partners who are not product manufacturers or service providers, such as the SMEs and academic institutes, SPIN will evaluate the possibility of setting up a licensing pool such that revenues can be shared by partners in proportion to their contributions to the pool, and the risk they incur with product and service development.

Intellectual Property Right (IPR) issues and the exploitation plans are directly under the control of the Project Management Committee. The state of the required existing knowledge and the rights to use the developed knowledge will be the subject of specific IPR annexes to the Consortium agreement which will be developed in line with the recommendations of the European Commission following the rules and regulation of the EC Model Contract.

Within SPIN WP1, we will develop and maintain an intellectual property plan such that opportunities for gaining and exploiting patents are monitored, and to ensure that essential project know-how is protected. The rules governing IPR will be defined in the Consortium Agreement.

Key IPR will be protected with patents, and the “know-how” elements of the system (those elements that are not themselves patentable or of great scientific interest, but are necessary for an efficient implementation) will be confidential to members of the project consortium. The key scientific advances will be published in open literature and presented at Concertation Meetings.

Section 4: Ethical Issues

SPIN partners have identified several ethical and gender issues related to the proposed research and developments. They include gender, privacy, trustworthiness and accessibility

Gender Issues

The consortium is well aware of the existing barriers to wider participation of women in engineering related projects. The main barrier is the low percentage of female researchers in related areas across Europe. The consortium has already commenced discussions relating to gender issues and embarked upon developing an orchestrated activity. **SPIN** could be instrumental in attracting more female researchers to the area and provide a gateway to increased participation of women in related research and industry. In this project gender issues should be addressed rather than being swept under the umbrella of equality. This will involve implementation of positive action to promote women participation in all stages and spheres of the project. A policy statement will be included in the consortium agreement, which outlines the steps that secure the implementation of positive action. These include extended efforts to employ researchers and engage female members of staff into the project. However, these will be undertaken without compromising equal opportunity principals incorporated within EU policy documents. Although **SPIN** partners are not in the position to significantly affect the socio-cultural reasons that originate the gender bias in technology-oriented schools, the consortium has planned a set of specific actions aimed at reducing the gender disproportion. The following is an action plan indicating actions and activities that will be developed to promote gender equality in all forms within the project. The plan will consist of the following:

- The **SPIN** Coordination Office will make special efforts in order to be as gender-balanced as possible in the first place, and will monitor the impact of the project activities on gender balance and gender-related issues
- **SPIN** partners will participate in promotional initiatives to illustrate university curricula in high schools, with the specific goal of reducing gender bias in technical universities.
- The partners of the project will promote the creation of women's new media communication systems users group in order to provide women with a more comfortable environment to ask questions.
- System interfaces will be evaluated in terms of user preferences in order to account for gender peculiarities in person-machine interaction. In fact, research indicates that interaction with services and technology is strongly gender-dependent, therefore an increased participation of women as software and system interface designers will be pursued by all **SPIN** partners.
- Specific initiatives will be initiated by **SPIN** partners in order to approach a gender balance, such as women-only tutorials, information campaigns and rate subsidies.

The plan will try to abide by the Commission's threefold relationship between women and research, articulated around the following:

- Women's participation in research to be encouraged both as scientists/technologists and within the evaluation, consultation and implementation processes
- Research must address women's needs, as much as men's needs
- Research must be carried out in such a way as to contribute to an enhanced understanding of gender issues.

To guarantee equality of opportunity and treatment between women and men in research a set of standards will be set and their implementation monitored. This will help protect women against all sorts of discrimination. This project will implement various technical cooperation projects and programmes to promote equality of opportunity and treatment for women and men. Women will participate in and benefit from technical cooperation activities in all areas of concern. Particular efforts will be made to ensure that gender issues are considered during all planning, designing and implementing of activities described in this document. This plan includes the provision of advisory services through direct contacts and consultative missions coordinated by the **SPIN** Coordination Office. This is seen to be one of the most effective means to implement equality of opportunity and treatment for men and women in research in the various technical fields. Assistance will be provided to the various groups involved to implement concrete measures for reducing discrimination and to formulate and revise practices to ensure equality. **SPIN** hopes to gather and analyse information on issues of concern to women scientists/researchers and gender equality in order to guide efforts to improve their status. This will be for use within the project and the knowledge will be shared for implementation in other projects.

SPIN partners are strongly convinced that gender differences are fundamental organising features of life and society and, therefore, they should not just be accepted, but also treasured, as they have important implications in scientific knowledge, technological progress, service characterization and content development. The research areas covered by **SPIN** have significant impact on gender equality in terms of targeted technologies, applications and services. In turn, this induced gender bias impacts on the development of new forms of communications and relationships between citizens and institutions throughout Europe. These issues will be tackled in this project by promoting affirmative action at the institutional level according to the gender action plan described before.

Privacy

In order to facilitate research and development activities in **SPIN,** the system and system modules need to be tested with real user data. For testing of developed techniques in realistic scenarios the user model will keep a history of use for individual users and automatically learn the personal preferences from this, for instance in during system interface design. This could raise privacy issues. Individual data stored in digital format, even if anonymous, are subject to privacy regulations. In principle, this implies that data storage is to be restricted to what is necessary, that users have to be notified of this fact, that users have a right to inspect what is stored about them, and that their data is not to be transmitted to third parties and used for purposes other than those covered by the relationship the user has entered to the owner of the data. In this context **SPIN** will observe European legal regulations concerning privacy. This is at a policy level, and will be monitored and reinforced by the **SPIN** Coordination Office and its legal department. At the technical level reasonable technical measures concerning data security of personal data will be applied. For instance transmission of personal data over open communication channels will be done in encrypted form only.

Trustworthiness

This is another important issue in cooperative technological developments. **SPIN** will take the necessary measures to foster trust of users in the technology developed. The project will deal with the policy aspects of trust, and it will recommend and apply existing technology to achieve and ensure security and trustworthiness. Observing a line of prudent concern, **SPIN** will make sure that by means of operational guidelines and procedures all user-specific information will reside in the users' terminal equipment and will only be exchanged to

configure, perhaps dynamically, the communication link to be established. From a research point of view **SPIN** will also deal with trust issues by performing research on security of software and to some extent data transmission.

Accessibility

SPIN partners are very aware of accessibility issues generated when new technologies are introduced and therefore special care must be taken to avoid the creation of barriers that put people off the new technologies. The project will tackle this through both the research within the project and the dissemination of the results.

WP4 in particular requires the development for interfaces for committing content to and accessing content in the repository. Given that the **SPIN** environment will support semantic annotations of media for different purposes and that personalisation is one of the project's themes, we will ensure that accessibility issues are directly addressed. These should not be seen as addressing the needs of a small part of the population, but in a wider sense of providing novel interfaces for users in "interface challenged" situations, such as driving a car ("visually impaired") or with frequent interruptions from children ("cognitively impaired").

From a dissemination perspective, the project will allow the non-specialist citizen access to the outputs of the technology that is being developed. The reason for this is to establish at an early stage what is interesting to the user, what is helpful to the user, e.g. with different literacy skills and languages, and conversely what may be technologically interesting but either confusing or not addressing features that user needs. This will provide feedback on the targeted user centred research and the tools and techniques that are given attention. If this can be achieved it will contribute the success of the research and have wide societal implications.

In addition to the research perspectives on creating and accessing content, other standard channels for dissemination, such as the Web, will conform to the appropriate standards and guidelines.

Whenever new developments will not be compatible with existing standards and recommendations, **SPIN** will engage in overcoming specific problems and difficulties aiming at guaranteeing equivalent levels of accessibility and usability. More specifically, this will be achieved by setting guidelines, design recommendations and dissemination of best practices.

These concerns will be made in agreement with relevant standardisation bodies.

*The Project efforts to ensure accessibility to physically impaired people will aim at facilitating accessibility problems and reducing impact of physical disabilities on accessing the technologies produced by **SPIN**.*

ETHICAL ISSUES TABLE

	YES	PAGE
Informed Consent		
• Does the proposal involve children?		
• Does the proposal involve patients or persons not able to give consent?		
• Does the proposal involve adult healthy volunteers?		
• Does the proposal involve Human Genetic Material?		
• Does the proposal involve Human biological samples?		
• Does the proposal involve Human data collection?		
Research on Human embryo/foetus		
• Does the proposal involve Human Embryos?		
• Does the proposal involve Human Foetal Tissue / Cells?		
• Does the proposal involve Human Embryonic Stem Cells?		
Privacy		
• Does the proposal involve processing of genetic information or personal data (eg. health, sexual lifestyle, ethnicity, political opinion, religious or philosophical conviction)		
• Does the proposal involve tracking the location or observation of people?		
Research on Animals		
• Does the proposal involve research on animals?		
• Are those animals transgenic small laboratory animals?		
• Are those animals transgenic farm animals?		
• Are those animals cloned farm animals?		
• Are those animals non-human primates?		
Research Involving Developing Countries		
• Use of local resources (genetic, animal, plant etc)		
• Benefit to local community (capacity building i.e. access to healthcare, education etc)		
Dual Use		
• Research having direct military application		
• Research having the potential for terrorist abuse		
ICT Implants		
• Does the proposal involve clinical trials of ICT implants?		
I CONFIRM THAT NONE OF THE ABOVE ISSUES APPLY TO MY PROPOSAL	YES	