



NEM Challenges for 2013 and beyond

**SOCIAL NETWORKS, SOCIAL MEDIA AND
PLATFORMS FOR COLLECTIVE AWARENESS AND ACTION**

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November 2012

Objectives of the document

This document focuses on a field of application of NEM technologies and services, encompassing “Social networks, “Social media” and “Platforms for collective awareness and action”. It aims at identifying how NEM research can support developments in this field.

Social networks, Social media and Platforms for collective awareness and action

The development of Web-based “Social networks” in the mid 00’s has had a tremendous impact, all over the world, on the way people can join and form social groups, extend their contact network and communicate.

Progress in networking technologies and services, new generations of digital mobile phones and cameras, and Web 2.0 applications have then allowed a wider creation and exchange of user-generated content, leading in the recent years to the emergence of the term “Social media”.

More recently, further progress in ICT and the reaching of a certain maturity level of “Social networks” and “Social media” has led to foresee the quick emergence of “Platforms for collective awareness and action”, also called “Collective Awareness Platforms for Sustainability and Social Innovation”:

- The potential of such platforms has been underlined by Ms Neelie Kroes, VP of the European Commission in charge of the Digital Agenda, at the OECD High Level Meeting on Internet Economy¹, in June 2011.
- The “1st Dialogue on platforms for collective awareness and action”² has been held in Brussels on Sept. 9, 2011 and chaired by Robert Madelin, Director General of DG Info.
- In the ICT work programme for 2013, the topic of "Collective Awareness Platforms for Sustainability and Social Innovation" is specifically mentioned as a focus for Call 10.

“Platforms for collective awareness and action” can be defined as ICT-based platforms combining open online social media, distributed knowledge creation and data from real environments, in order to strengthen new initiatives of social innovation. Such platforms can indeed support environmentally and socially aware processes and practices, in order to share knowledge, achieve changes in lifestyle, production and consumption patterns, and set up more participatory democratic processes.

¹ europa.eu/rapid/pressReleasesAction.do?reference=SPEECH/11/479&format=HTML&aged=0&language=EN&guiLanguage=en

² ec.europa.eu/information_society/activities/collectiveawareness/index_en.htm

There are already many examples of these platforms in Europe and in other regions of the world, an interesting sample of them having been invited the “1st Dialogue on platforms for collective awareness and action”.

As bottom-up initiatives, these platforms are actually allowing for individual expression, participation, creation of collective knowledge and situational awareness among citizens, who share their lifestyles and expectations, while aggregating in a huge network that can influence and support political decisions. Thus, there is logically an increasing attention to them by political leaders.

Identified research topics

Building on past NEM work

It is important that the present document takes into consideration and builds on the results of previous work in the domain involving the NEM constituency or NEM projects.

Among them:

- The “Social networks overview” document released in November 2010 by the nextMEDIA project³ concluding on the following research challenges:
 - Avoiding fragmentation of the social graph through open cross-platform interactions
 - Communities discovery and analysis in large scale online and offline social networks
 - Security by means of Social Networks Analysis
 - Social and Ethical Issues in a Networked World
 - Searching blogs, tweets, and other social media
 - Human-powered community question answering and expert finding.
 - Traffic prediction for dimensioning media applications
 - Social, mobile, pervasive content sharing and live media distribution
 - Spam, opinions and adversarial interactions in social media
 - Personalisation for social interaction
 - Dynamics and evolution patterns of social networks, trend prediction
 - Information diffusion in Social Networks
 - Use of Social Networks for business and marketing
 - Social gaming and social television
 - Immersive Social Networks

³ <http://cordis.europa.eu/fp7/ict/netmedia/docs/publications/social-networks.pdf>

- The latest edition of the NEM Strategic Research Agenda⁴, “Opportunities for an innovative Europe”, dated September 2011, that lists in particular, in its chapter “Social networking and media sharing”, the following “Action items for inclusion in future ICT research”:
 - Evolution and future impact of social networks: ‘Conversational Content’ applications, online communities, new communication modalities (new forms of content, new models of interaction, etc.).
 - Simplified devices for social networking.
 - Support of future business models through micropayment, context aware ad-insertion, personalisation and recommendation, and enable broader monetisation of user-generated content.
- The papers presented at the 2011 NEM Summit in the “Social media” track⁵ and the presentations made in the “Social media” session of the Consultation workshop on the ICT Work Programme for 2013 in the Networked Media Systems⁶ area.

Going to the next research level

The group formed among NEM members to address the challenges related to the domain of “social networks, social media and platforms for collective awareness and action” proposes the following list of possible research topics and open questions that the NEM community could usefully consider in this domain.

- **COLLABORATIVE (USER-GENERATED) CONTENT CREATION**

Social media can support the collaborative creation of content by users (text through typical wikis but also more complex multimedia assets), thus enlarging the scope of possible applications offered to customers and increasing the usage of their devices. Which technologies, applications, services have to be developed to truly open such a perspective?

- **MULTIDISCIPLINARY APPROACH OF SOCIAL NETWORKS AND SOCIAL MEDIA**

So far, social networks and social media have, to a large extent, only involved ICT specialists in their design and development. Let’s go for a true multidisciplinary clean-slate approach of social networks and social media involving specialists from different disciplines (sociology, law, philosophy, business, art, etc.) and see what will come out... It may well open quite promising application and business perspectives!

⁴ <http://www.nem-initiative.org/fileadmin/documents/VisionSRA/NEM-SRA-080.pdf>

⁵ <http://nem-summit.eu/past-events/2011-nem-summit/>

⁶ http://ec.europa.eu/information_society/netmedia/events/consultations/wp2013consult/index_en.htm

- **SOCIAL NETWORKS AND MEDIA ANALYSIS**

The fact that users currently annotate and comment in Social Networks through tags, ratings, social connections and preferences, and that these activities are performed on a regular basis, gives social media data an extremely dynamic nature that reflects topics of interests, events, and the evolution of community opinions. However, current technologies have largely focused on enabling the production of large volumes of media and piecemeal consumption of tweets, images, or songs. In contrast, the utilization of aggregated collections of such media and the combination of their multimedia, spatiotemporal, and social context provide the ingredients for deep understanding of events, patterns, and situations emerging from data. The need for aggregation of different sources and for the combination of their rich context requires scalable and multi-modal approaches that are able to handle the massive amount of available data (big data) and transform SNs to inference engines of topics, events, and ultimately facilitate planning, prediction and action.

Some example applications include: personalisation and retrieval applications, where social-based indexing and user profiles can incorporate information about the structure and activity of the users' social network directly into the personalisation, search and ranking process. They can also be applied to solve problems in fields such as tourism and culture, social sciences, politics, economics, and marketing. In tourism and culture, uploaded media can reveal "off-the-beaten-path" points of interest and events, otherwise difficult to discover through usual Web sources. In politics, Web data may contain the most up-to-date information that can reflect the popularity of elections candidates and their support among populations. In economics, marketing and brand monitoring, the number of related media uploaded online can reflect the number and locations of products sold in the market.

- **CONTENT EVOLUTION**

Social network content is predominately text, image and video-clip based. Will this expand to include long-form and near-synchronous media consumption? What is the impact of the 'content social window' on this, and what are implications on network architecture?

- **CONTENT-MEDIATED COMMUNICATION**

Understanding the psychology of social network usage and the interplay with content will provide a powerful roadmap towards new and exciting services as communication and content services become increasingly intertwined and interrelated. These 'Conversational Content' applications are providing a form of convergence and underpin the rich and creative, and often subtle, ways in which people express themselves and communicate with others through the use of content.

- **ONLINE COMMUNITIES**

How do online communities form, grow or wither? What are the critical success factors and how can technology support these?

- **COMMUNICATIONS MODALITIES**

Increasingly we switch communication modality to suit our needs. Research is needed to broaden the role that ICT has in supporting and facilitating new communication modalities and to enable the business models that may emerge as a result.

- **DEVICES**

How can devices and user interfaces continue to evolve to facilitate easier media sharing across new forms of content and new models of interaction? How will online social behaviour translate to the TV with more participation and interactivity through second screens?

- **BUSINESS MODELS**

Intelligent ICT to support micropayment, context-aware ad-insertion, personalisation and recommendation will enable broader monetisation of user-generated content and disrupt existing industry value-chains.

- **SOCIAL MEDIA AS A DRIVER FOR INNOVATION**

Social media can support service and technology innovation by involving end-users and their communities in different activities ranging from idea generation, through beta-testing to development. This will not only potentially reduce costs and time-to-market, but also help creating services and products addressing real needs and interests of users.

The question is how to utilise social media as a driver for innovation in best possible way. How to motivate and involve users and their communities to contribute? Which technologies are needed to support users and organisations in co-innovation? How to analyse and exploit the huge amount of information already available on social media for the purpose of innovation? What are the ethical and legal issues related with its usage? What kinds of processes will dominate innovation? Which business models are suitable for future innovation processes? Answering these questions requires not only technology development and advancement, but also empirical or user-based evaluations of the proposed models and technologies.

- **LOCATION SERVICES, CONTEXTUALISATION AND PERSONALISATION**

What are the commercial benefits and new business models to be gained, conversely what are the privacy and data management issues?

Use of location and contextualisation in social networks, importance of change to mobile access from static (pc based) access. Increasing numbers of users are accessing the internet from mobile devices in preference to using a static p-c installation. Moreover, amongst young people in particular, mobile devices are the platform of choice for accessing social media, with facebook being the number one destination. Because social media and mobility are so closely linked, location services are now becoming common, and the opportunity to link personal location and social interaction will provide new business opportunities on the one hand, and new personal opportunities for interaction on the other. Images can be, and frequently are, geo-tagged when recorded with smart phones and shared with others. At the present time users are reminded when their location is going to be used by an application, and although this is a desirable feature since it preserves privacy for the individual, constant requests for approval are likely to be intrusive and could lead to users taking a default 'allow' status. Their location may be shared with friends, who might want to meet with them, but could also be shared with retailers – for example using a QR code on a product in a shop might alert the supplier of the product who might try to direct the consumer to other products in the same shop, might alert the retailer who could more quickly deal with your request (and try to sell other related products) or could be used by a third party application provider who would alert the consumer to nearby retailers having the same product at a lower cost. But the crucial innovations will come from linking between location, contextualisation, personalisation and recommendation. By combining a knowledge of the users' personal tastes, their context (are they going from shop to shop or just looking whilst going somewhere else), recommendations from their friends (specific or implicit) and their location, retailers, product and service providers will be able to shift the commercial battle-ground onto the consumer's device, and third party recommender or advertising organisations will be able to take up intermediary positions. This does introduce significant issues with regard to maintenance of security and privacy which will need to be addressed. Giving explicit consent to every piece of data which is shared with friends or commercial enterprises will quickly become onerous and intrusive, but assuming consent may lead to inadvertent distribution of sensitive data (a shoe sales company may benefit from knowing a consumer has just visited the chiropodist, but should they have access to that information?). Means need to be devised to allow consumers to benefit from improved service and better social collaboration, but whilst still maintaining control over their privacy and ensuring their private data is kept secure. This may be by means of an intelligent interface which can make decisions on behalf of the user or by

some other means, but mechanisms need to be in place from the outset to prevent irretrievable loss of personal data.

- **IMPACT OF USER-GENERATED CONTENT ON NETWORKS AND QUALITY OF EXPERIENCE**

How does user behaviour evolve with increasing capability of networks and access to non-specific storage and processing (i.e. cloud) services? What evolutions are necessary in the interplay between content, network, QoS expectations of providers and QoE expectations of users? What are the driving requirements on smart, self-configuring networks, and how does this change the business value chain?

Increasingly, social network users are communicating by images as well as by text (picture and video messaging up 30% since 2009). Social networks are being used to share experiences via smart-phone cameras at sporting and entertainment events, and still images are being supplemented by video shots. Recommendations are being made to vimeo or youtube movies, networked gaming is being conducted on mobile devices and higher quality video is being streamed to a range of display platforms from sources such as the BBC iPlayer. This activity has the inevitable result of demanding high bandwidth availability and low latency in order to deliver the quality of experience that users expect. It also has the effect of demanding network upgrades and ever increasing capacity (in 2010 global mobile data consumption was 2,844 petabytes, by the end of 2011 it had doubled to 7,164 petabytes, and this trend is continuing or even accelerating (Comscore, cited by Dare in 'Digital Britain' May 2012). There is a quality of experience expected by the 'always-on' generation of networked users, but this will become increasingly difficult to achieve whilst network operators are expected to invest in bandwidth that is benefiting other over-the-top service providers. Greater connectivity needs to be achieved between the content layer and the network layer, and new business models can be expected to emerge as networks become smarter and are enabled to respond to the demands of the content traffic.

- **USER BEHAVIOUR AND NEEDS IN THE SOCIAL NETWORKS**

Even the social networks world-wide are being very successful and are attracting every day more and more participants (the best examples are Facebook in private sphere and LinkedIn as a business related network), showing that a basic need of humans to communicate in different ways is also successfully covered by this type of communication environment, we cannot say that the social networks are established in accordance with results of extensive studies on user requirements in this respects and they are rather crated and further developed depending on current trends in the area. Privacy, as an important issue related to the social networks, is probably the unique example of related user requirements which is

extensively considered (even not yet solved) within the research community, taking into account deep technological, societal, and legal aspects. Therefore, an extensive analysis of the user requirements on the social networks seems to be still an open research topic. As an example, we can mention filters to automatically select topics, posts, connections/members, etc. which will appear in the social network portal, when a user login, and which are selected with the user's choice. Another example could be a need to participate in multiple social networks (e.g. one for private purposes and another for professional) by maintaining one user profile which is then adapted to different networks and portals. What else can we identify as user requirements on the social networks and what can we learn from the users' behaviour in the existing networks?

- **CONTENT SHARING IN RESPECT TO DRM AND SIMILAR ISSUES**

It is now new that social networks are recently not only used for basic communication within various groups and to connect people and that are more and more used for sharing of different types of digital content. For the time being, mainly privately generated content (pictures, videos, experiences, etc.) is shared within the networks but portion of professional content, with clear ownership and authors rights, shared and posted in the social networks is continuously increasing. Furthermore, the social networks are also used by a continuously increasing number of professional organisations, which increase importance of the DRM issues dramatically. Therefore, it is important to answer the question of DRM issues in the social networks and to lie down corresponding rules. What can we learn in this respect from other areas where this issue has already been considered (Internet TV, music sharing, etc.), what are specifics for DRM in the social networks, and what could be the best approach?