

The Big Challenges

“Networked and Electronic Media”
European Technology Platform

The birth of a new sector

www.nem-initiative.org

Version 11



**NETWORKED
& ELECTRONIC
MEDIA**



1. NEM IN THE WORLD

The main objective of the Networked and Electronic Media (NEM) Technology Platform is to foster the development and introduction of novel audiovisual and multimedia broadband services and applications to benefit European citizens and enterprises.

The NEM Technology Platform focuses on an innovative mix of media forms, delivered seamlessly over technologically transparent networks, to improve the quality, enjoyment and value of life. NEM represents the convergence of existing and new technologies, including broadband, mobile and new media across all Information Communication Technology (ICT) sectors, to create a new and exciting era of advanced personalised services.

NEM is an industry-led initiative to promote and direct the large-scale initiatives needed to accelerate the pace of innovation and the rate of technology evolution, so as to position the European Industry at the forefront of global technology markets, and give users an abundance of value-added services and applications to choose from for achieving optimal benefits for all. All these efforts take into account the evolution from home and office environments towards broadband extended home and office environments.

NEM is the forum for industry and academia:

- To share visions for future research and development
- To develop a common strategic research agenda.

The NEM domain addresses all aspects of the media services lifecycle from content creation (by professionals and increasingly by individual citizens) to the delivery and utilization of innovative networked and electronic media services and applications.

The NEM domain provides compelling opportunities for economic growth and the well-being of European citizens. As the total ICT market currently represents about 8% of European GDP, the commercial potential of the NEM sector is a key contributor to the economic development of Europe. The NEM sector contributes to crucial developments and improvements that benefit society at large: technological developments offer new services to enrich culture, education, health services and assisted living. The European media and related industries are significant economic players in their respective arenas. Over the next 15 years the converged NEM domain has the potential to become the largest economic influencer in Europe.

NEM is one of the most important pillars of the Seventh Framework program. Its effort is focused on producing concrete R&D results to ensure commercial continuity, strengthen the scientific and technological bases of the European Community, and to empower the European NEM industry to compete in the global marketplace.

2. THE FIVE CHALLENGES

In the NEM vision statement for the 2015 horizon and beyond⁽¹⁾. Its goals have been defined: The NEM Strategic Research Agenda (SRA) identifies the key technologies and research domains that need to be addressed to achieve these goals. The SRA identifies five big challenges on which NEM should focus investments and commit R&D efforts in the coming years:

- To create interoperable network infrastructures that enable seamless multimedia networking
- To empower end-users by putting the user first
- To promote “electronic content from all to all”
- To merge the various media and content formats
- To develop new middleware for media applications

In the coming sections, more detailed information will be provided about the scope of each challenge and related activities. Investment levels are estimated at 3,5 billions € for the period 2007 – 2013.



2.1. To create interoperable network infrastructures that enable seamless multimedia networking

This challenge requires the following activities:

2.1.1 Converging telecom, broadcast and home networks

For the end-user, fixed networks, wireless networks, broadcast networks and home networks do not work together easily. By implementing the

NEM vision, services will be delivered seamlessly, irrespective of the underlying network, infrastructure or end-user environment (home, car, office). This approach will leverage the opportunity to develop new network architectures that support self-adapting services which are capable of managing application layers.

As network operators cope with increasingly complex networks of operation due to network and terminal diversity, growing session (traffic) volume, and evolving business relations, the novel network architecture needs to maintain a high-level knowledge of the network usage and behaviour beyond what is available in today's network control and management systems.

(1) See <http://nem-initiative.org>

2.1.2 Development of terminals that adapt to various networks

Currently, each network needs its own terminal. These terminals are becoming more and more complex in order to manage the many new media formats and applications that are being developed. The result is poor or no interoperability. NEM's objective is to solve this issue by developing open source technologies and interfaces that share resources and use common enablers (media format, metadata scheme, user interface, identification of users and their needs).

2.2 To empower end-users by putting the user first

Consumers are not interested in networks but in the services the networks can supply. NEM will provide innovative services and applications with the complexity hidden from the user. This challenge requires the following activities:



2.2.1 Development of new applications mixing media and communication

Currently, person-to-person communications (Video conference, VoIP, Mobile) are distinct and separate from media content delivery. The challenge is to achieve interoperability between personal communication and simultaneous sharing of multimedia content (for instance, TV, video, music, and photos).

2.2.2 Supporting end-users with content creation processes and personal content management.

At present, users cannot create, manage and share multimedia digital content from various sources as easily as they can manipulate text (with word processors and email). Intuitive end-user applications and pervasive end-user services will require interoperable systems and tools coupled with easy and sensible human interfaces that facilitate creation, enrichment, sharing and consumption of multimedia content and adapt to individual user needs.

2.2.3 Quality of Service from the end-user perspective

Operators currently measure 'Quality of Service' in network terms such as bit-error ratio and maximum throughput. However, what the user perceives is a service or application that works under well known quality levels. Operators need to use techniques such as behavioural modelling and channel prediction to educate users as to what they can do to make their applications work within the parameters of the network that is actually available.

2.2.4 Development of simple standards to interconnect end-users' equipment

Full inter-connection of home or extended-home media equipment is still not a reality. Integrated open architectures with seamless access for extended home applications for all types of audio-visual services needs to be developed. These architectures need to be secure, trustworthy, personalized and have context awareness solutions.

2.2.5 Solutions for people with special needs

Personalisation of networks, terminals, services and applications must include recognition of -and adaptation to - individual users, whatever their special needs. NEM has a tremendous opportunity to respond to the huge social demands of the next 20 years when audiovisual aids will allow significant human assistance for millions of European with disabilities.

2.3 To promote “Electronic content from all to all”

For individual citizens, the electronic content creation and distribution process is still blocked by a lack of interoperability and an incomplete regulatory framework. This challenge requires the following activities:



2.3.1 A common digital asset management (DAM) system and interoperability rules

Several available digital asset management (DAM) systems provide safe and efficient solutions in closed domains but are not interoperable with each other. Consequently, content cannot be securely exchanged between platforms. An absolute requirement is to create a DAM system that allows real association of content with rights handled during the full content life cycle.

2.3.2 Development of secure solutions for electronic content distribution

From production through electronic distribution to display, there is no current solution to protect content from unauthorised access. Most solutions provide partial security in a defined security domain but they do not track records of historical rights and access control information. This information disappears during the formatting or editing processes. Most solutions provide high protection to professional content but no simple and affordable protection for personal content. New formats and security technologies need to be developed that can be used in the media network, and that keep track of rights transfer by means of cost-effective, easy-to-use solutions. These solutions should also address digital cinema (local or distributed), as well as content storage and peer-to-peer (P2P) systems.

2.3.3 Development of new business models with identity trust and micro payment provisions

New forms of multimedia are assets that users will want to offer for sale in a secure environment with acceptable transaction costs, even for small sums. Developing a framework for identity trust and transaction management will provide the basis to match that requirement.



2.4 Accelerating the convergence of various media and content formats

Content creation and modification is rising with the growing number of distribution channels and targeted terminals on the increase. The trend towards “push services” coupled with the variety of delivery formats creates the need for automatic real-time content personalisation and easy editing and formatting tools. This challenge requires the following activities:

2.4.1 Development of new formats and tools that enable “Produce once. Use everywhere” methodology

Currently most content has to be made specifically for each application platform. New or enhanced formats are needed that allow parallel use of content on different multiple delivery platforms, while protecting creative freedom. In addition, all associated metadata or interactive creation tools should retain versioning information from previous processing.

2.4.2 Design a framework to store, manipulate, archive and manage Rich Media

Currently there are no adequate methods available for storing, archiving and searching interactive multimedia content for professional and consumer applications. With the increased use of multimedia there will be a need to develop interoperable and scalable systems to support the use of electronic media, i.e., new methods for storage, retrieval and search, and asset management.

2.4.3 Development of new content formats and structures that allow cross Media interaction and integration.

Currently, content producers (TV, audio, games, etc.) do not take full advantage of the possibilities for interaction offered by new media. NEM includes the development of new forms of interactive content built around NEM tools. This will mean a stronger use of ICT/NEM platforms and services by the media industry and, at the same time, a huge opportunity for citizens to enhance their participation.



2.5 Development of new middleware for media applications.

Middleware is the software that turns a terminal into a platform that can support multiple applications. For example, common platforms are needed that can exploit the potential of content interactivity or 3D visualisation, and that can be used in various media terminals from Set-Top-Boxes to cell phones and game consoles. To address these challenges the following activity should be conducted:

2.5.1 Design of open middleware platform for a wide range of applications

Current middleware solutions are not interoperable and are not available to all on fair and reasonable terms. An open

middleware framework is needed that can be used for a wide variety of services and applications. It must be adaptable and supported by suitable tools for authoring applications that will run on a wide range of devices. A suitable middleware platform would make the creation of content and user navigation transparent across different technologies, such as broadcast and internet, simultaneously stimulating both markets.

