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**Projectvoorstel IM-Pact (theme 1)**  
**NIAGARA**  
**Nieuws AGgregeren, Aanpassen &**  
**RAadplegen**

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Dit document moet als strikt vertrouwelijk worden behandeld

**As both Prof Hardman and her two doctoral fellows Raphaël Troncy and Zeljko Obrenovic, who all contributed to this proposal, are not native Dutch, the most important parts are written in English.**

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# Management Samenvatting

Het internet – en meer bepaald de internet technologie – heeft een steeds grotere impact op de nieuwsindustrie die dagbladen, radio bulletins en televisie programma's produceert. Ook de eindgebruikers zelf hebben tegenwoordig verwachtingen die conventionele radio, televisie en gedrukte media overstijgen. Configureerbare berichtgeving, afkomstig van verschillende bronnen (nieuwsagentschappen, blogs en Wikipedia-achtige achtergrondinformatie), zal langzaam maar zeker de huidige uni-size nieuwssites vervangen. Uiteindelijk zullen de mechanische en sequentiële productiemethodes vervangen worden door schaalbare, configureerbare en aanpasbare methodes die de interactiviteitsvereisten van de eindgebruiker zullen ondersteunen. De nieuwsproductie workflow zal immers fundamenteel moeten hertekend worden aangezien schaalbaarheid en interactiviteit voor elk nieuwsfeit een modulaire setup zal vereisen om Nieuws AGgregatie, Aanpasbaarheid en RAadpleegbaarheid te bewerkstelligen.

Nieuws verschilt van andere content doordat het continue informatiestromen zijn die in verschillende mediavormen komen en zo samen geïntegreerd moeten worden, waardoor problemen van schaalbaarheid en trust niet vanzelfsprekend opgelost kunnen worden. Nieuws items worden zo snel mogelijk online geplaatst en zullen continu bijgewerkt en uitgebreid worden gedurende hun levenscyclus. Aangezien de typische levenscyclus van een nieuwsbericht zo'n 24 uur bedraagt en er ieder uur op zijn minst één nieuwsbulletin gepubliceerd moet worden, wordt de productie van nieuws constant als een 'moving target' gezien. Dit legt complexe architecturale beperkingen op aan de productieomgeving. Door de onvoorspelbaarheid van nieuwsfeiten overlappen en verstoren de verschillende fases van nieuwsgaring compositie, productie, publicatie en distributie elkaar.

In veel multimedia systemen is het reeds mogelijk om semantische annotaties te relateren aan media assets. Maar tussen deze systemen onderling is er geen gestandaardiseerde manier om deze relaties uit te wisselen. Binnen de multimedia gemeenschap hebben we als eerste een beperkt aantal fundamentele media productieprocessen, *canonische processen* [1], geïdentificeerd. We benoemden hun inputs en outputs, maar bleven bewust op de vlakke over hun interne werking, omdat we ons concentreerden op de informatiestromen tussen deze processen onderling. Aldus identificeerden we een kleine set bouwblokken die semantiek bewuste productie middelen kunnen ondersteunen.

Gebaseerd op deze canonische processen van media productie zullen we bepaalde aspecten van metadata 'harvesting' in de keten van nieuws processen belichten, waardoor we in staat zullen zijn om die media met verschillende vocabularia te beschrijven, die metadata in elke fase van de nieuws workflow te kunnen toevoegen, de juiste zin van die metadata en het historisch perspectief van de maker daarvan zullen kunnen behouden. Verder zullen we ook metadata voor verschillende doeleinden kunnen onderscheiden, zoals: het opvragen door verschillende gebruikers, presentatie naar de eindgebruikers, aggregatie om in verschillende media publicaties geïncorporeerd te kunnen worden, het garanderen van het gewogen historisch perspectief, enz.

Het overkoepelende doel van dit NIAGARA project bestaat erin om bestaande systemen en nieuws workflows te upgraden zodanig dat deze alle mediale content en expliciet bijhorende metadata kunnen behandelen zodanig dat Nieuws AGgregeren, Aanpassen en RAadplegen door verschillende gebruikers tijdens verschillende fases van de nieuws workflow mogelijk wordt. We zullen software wrappers voorzien voor de inputs en outputs van de huidige gangbare systemen, waardoor die toegang zullen krijgen tot repositories die deze media assets en hun geaggregeerde, geassocieerde metadata kunnen produceren, verzamelen, beheren en distribueren.

Om de onrealistische verwachtingen te minimaliseren (id est: enkel interessant, doch puur academisch, werk doen), zullen we gedurende het gehele NIAGARA project intensief samenwerken met partners uit de nieuwswereld: VRT, AFP en Belga. Aldus verzekeren we ons dat we relevante problemen oplossen en dat de oplossingen uitgerold zullen worden in een productie omgeving,

zodanig dat:

- Journalisten van deze infrastructuur gebruik kunnen maken om hun dagelijks werk te vergemakkelijken en te verbeteren (Belga, AFP, VRT)
- Archivarissen van deze infrastructuur gebruik kunnen maken in de 'broadcast' wereld (VRT)
- Gemeenschaps portaal sites (dus de gewone eindgebruiker) van deze infrastructuur gebruik kunnen maken in een B2C scenario

Ons hoofddoel is weldegelijk het voorzien van een end-to-end omgeving om metadata te processen binnen het nieuwsdomein. Even belangrijk is het dat we deze beschrijvingen van Nieuws blijvend verenigbaar houden met de huidige nieuws standaardisatie activiteiten. CWI werkt immers in het kader van NewsML nauw samen met het standaardisatie orgaan IPTC. Ook MMLab doet samen met VRT & EBU inspanningen met betrekking tot NewsML binnen het IBBT-PISA project. Ons beider inspanningen hieromtrent zullen een goed startpunt zijn om de semantische mogelijkheden van NewsML verder te bestuderen en uit te breiden binnen de voornoemde standaardisatie organen. Verder zijn zowel CWI als MMLab lid van de standaardisatie organisatie W3C, zodanig dat we ook daar er voor zullen zorgen dat de metadata beschrijvingen verenigbaar blijven met W3C's standaarden (in het verleden via de MMSEM incubator groep [2] en binnenkort via de nieuw op te richten Video On The Web werkgroep [3]). Onze actieve standaardisatie activiteiten zullen aldus een heel belangrijk valorisatie aspect behelzen binnen de internationale nieuws distributie.

[1] : <http://www.cwi.nl/~media/projects/canonical/papers/accepted/model/model.pdf> en <http://www.cwi.nl/~media/projects/canonical/cfp/>

[2] : <http://www.w3.org/2005/Incubator/mmsem/>

[3] : <http://www.w3.org/2007/08/video/>

# Management Summary

The Internet – and internet technology in particular – has a major impact on the news industry producing papers, radio bulletins, and television news shows. Consumer expectations have extended far beyond conventional radio, television and published journals. Cross-functional and configurable content, engineered to scale from different sources (news wires, blogs, Wikipedia-like background info) will gracefully but irreversibly substitute current uni-size news sites. Eventually, mechanized and sequential manufacturing methods will be replaced by scalable, configurable, and agile methods capable of supporting exactly the window of interactivity desired by the end user. Assuming that scalability and interactivity of any news event requires a modular and news aggregation, adaptation and consultation set up, the news production workflow has to be fundamentally reengineered.

As News content differs from other content, an important differentiator is that it comes as continuous streams of information and in various forms of media that need to be integrated both posing problems in terms of scalability and trust. Items are brought on air or online as soon as possible and they are continuously enhanced by additional material during their lifecycle. Given an arbitrary lifecycle of an item being 24 hours and the requirement to issue a news bulletin at least once per hour, we conclude that news production is in fact a moving target. This poses complex architectural constraints on the production facility. Driven by the highly dynamic nature of the news events, the phases of news bulletin composition, production, publishing, and distribution overlap and interfere.

While, in general, many multimedia systems allow the association of semantic annotations with media assets, there is no agreed-upon way of sharing these among systems. As an initial step within the multimedia community, we identified a small number of fundamental processes of media production, which we termed **canonical processes** [1]. We specified their inputs and outputs, but deliberately did not specify their inner workings, concentrating rather on the information flow between them. We thus identified a small set of building blocks that can be supported in semantically aware media production tools.

Based on these canonical processes of media production we will highlight in particular those aspects of metadata harvesting down the processes of the news workflow, to be able to describing media using different vocabularies, adding metadata at every stage of the news flow, maintaining the history of the creator and intended purpose of the metadata, and distinguishing metadata for different purposes, such as: retrieval by different users, presentation to end users, aggregation for inclusion in different media publications, guaranteeing the historic weighted perspective of events, etc.

The overall goal of the NIAGARA project is to take existing systems and news work flows and upgrade these allowing them to pass all media content and explicitly associated metadata to enable the aggregation, adaptation and consultation of news items by different users at different stages of the news flow. We will create software wrappers around the inputs and outputs of the systems currently in place, enabling access to repositories that can produce, collect, maintain and distribute media assets and the aggregated metadata associated with them.

To minimize the risk of being unrealistic (id est: in order to avoid doing 'an interesting though purely academic exercise'), we will collaborate intensively throughout the NIAGARA project with news project partners (VRT, AFP, Belga, Beeld & Geluid) to ensure we are solving relevant problems and that the solutions can be deployed in a production setting, in a way that:

- Journalists will be able to make use of the infrastructure for improving their daily work (Belga, AFP, VRT)
- Archivists will be able to make use of the infrastructure in the broadcast world (VRT, Beeld & Geluid)
- Community portals (thus lay end users) will be able to make use of the infrastructure in a B2C scenario

While our main goal is indeed to provide an end-to-end environment for metadata processing in the domain of news, we will also ensure that the descriptions of News will be compatible with news standardization efforts. Both CWI's close collaboration with the IPTC standardization body concerning the standardization of NewsML and MMLab's NewsML efforts (together with VRT & EBU in the long run) within the IBBT-PISA project will be a good starting point to study and expand the semantic possibilities of NewsML within the aforementioned standardization body. In addition, CWI and MMLab's connections with the standardization activities within W3C will also ensure the metadata descriptions used will be compatible with those being developed at W3C, in the past via the MMSEM Incubator Group [2] and in the near future via the new Video On The Web Working Group [3]. Needless to say this will be one of the most important valorization aspects: actively helping standardizing international News distribution.

[1] : <http://www.cwi.nl/~media/projects/canonical/papers/accepted/model/model.pdf> and <http://www.cwi.nl/~media/projects/canonical/cfp/>

[2] : <http://www.w3.org/2005/Incubator/mmsem/>

[3] : <http://www.w3.org/2007/08/video/>

## Deel A.Kerngegevens

### A.1. Titel van het Project

Projectnaam	Nieuws AGgregeren, Aanpassen & RAadplegen
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Acroniem	NIAGARA
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### A.2. Aanvragers Vlaanderen/Nederland en partners

Aanvragers/partners Nederland	Aanvragers/partners Vlaanderen
Naam partner: Stichting Centrum voor Wiskunde en Informatica	Naam partner: Interdisciplinair Instituut voor Breedband Technologie – Multimedia Lab
Voornaam: Hardman	Voornaam: Rik
Naam: Lynda	Naam: Van de Walle
Titel: Prof.dr.	Titel: Prof. dr. ir.
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e-mail: Lynda.Hardman@cwi.nl	e-mail: rik.vandewalle@ugent.be

### A.3. Startdatum van het project

Startdatum	01/05/2008
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De startdatum wordt voorzien ten vroegste op 1 maart en ten laatste op 1 oktober 2008.

### A.4. Duur van het project

Duur in maanden	48 maanden
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Einddatum	30/04/2012
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De maximale looptijd voor projecten bedraagt 4 jaar.

## A.5. Begroting



Partner					
2008					
2009					
2010					
2011					
2012					
Kost in euro					
Kost in euro					
Kost in euro					
Kost in euro					
Kost in euro					
MM					
Pers					
Werk					
Totaal					
MM					
Pers					
Werk					
Totaal					
MM					
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Werk					
Totaal					
MM					
Pers					
Werk					
Totaal					
MM					
Pers					
Werk					
Totaal					



## **Deel B. Wetenschappelijke beschrijving van het project**

### **B.1. Description Innovation Target**

## Motivation

Nearly every European citizen reads, watches or listens to the news, at home, while commuting to and from work, at work and even as part of their work. As voting citizens, we need to understand local, national and international politics to allow us to cast our vote. As company employees, we need to understand the state and development of local, national and international economies to enable us to understand our markets. As part of our leisure time, we want to know about our favorite sports teams, the lives of our soap idols or the most recent books available. Nowadays, this information is online, and hence easily accessible by multiple devices (e.g., PC, mobile phone, PDA).

Information comes from different online sources and is made available to different users at different stages in the 'news flow'. Professional users have access to continuous streams of incoming data from press agencies as well as to archives of published news. Traditional news providers (e.g., journalists, news agencies, press, broadcasters) distribute news to other professional and lay users. Lay users have access to myriads of web sites, offering push and pull sources of news information and the means of contributing to the expanding collection of news data.

At each stage of this chain media content is passed from one process to another, along with meta data describing the content, either in terms of what the media content is expressing, or in terms of administrative data, such as who created it, where, and when. This metadata can be used to aid the different players at different stages of the news chain to search for, organize, enrich and present the news items.

## Problem

At each stage in the progress of a captured image or video sequence different users want to add their own descriptions to it for different purposes and pass this information on to other users 'down stream' in the news flow. The problem is that each user is faced with the metadata added by the previous user and also wants to add metadata for their own purposes. The tools used by each actor in the news chain are currently unable to deal with this growing need for creating and maintaining metadata by different parties.

In particular, existing systems provide insufficient support for:

- aggregating & linking individual news items within the same context to understand the complete picture of particular news events, e.g., an ordered & ranked filing cabinet of related items;
- describing media using different vocabularies;
- adding metadata at every stage of the news flow;
- maintaining the history of the creator and intended purpose of the metadata;
- distinguishing metadata for different purposes, such as: retrieval by different users, presentation to end users, aggregation for inclusion in different media publications, etc.

By solving the above problems the NIAGARA project will automatically build these clusters of news items from events, linking events between one another and providing the necessary context for understanding the news in all its facets. Furthermore end users will be able to have tools that will give them sufficient support to make sense of individual news articles or to create his/her own 'take' on a particular topic (e.g., by giving some background knowledge) and they will have a notion of how different news articles may be related to each other in a historical sense.

## Project Goals

The overall goal of the project is to take existing systems and current news work flows and upgrade these allowing them to pass all media content and explicitly associated metadata to enable the aggregation, adaptation and consultation of **news items** by different users at different stages of the news flow. We will create software wrappers around the inputs and outputs of the systems currently in place, enabling access to repositories that can produce, collect, maintain and distribute media assets as well as aggregation of metadata associated with them. In existing news work processes, news items are accompanied by a fixed set of metadata descriptions which facilitate their organization and aggregation by different users. By coupling existing metadata with controlled vocabularies, these can be used for finding relations among items in different repositories. The controlled vocabularies and this additional knowledge can in turn be used to 'power' interfaces for the end-user to gain higher-level consultation to the repositories' contents.

The project will use state of the art technology to improve the work flow in news partners and at the same time use the news domain as a means of testing tools and systems for metadata creation and maintenance.



## **B.2. Originality and Scope of Scientific & Technical Risks (state of the art)**

The originality of the NIAGARA project is to enable the processing of explicit semantics for metadata descriptions of media assets through every stage of the news flow process in an existing news processing environment. While current news flow processes use metadata to some extent, we will:

- associate descriptions with distributed, heterogeneous and formalized vocabularies;
- enhance descriptions with knowledge available on the web (e.g., wikipedia);
- ensure that media assets together with their associated metadata descriptions can be treated as single entities throughout the news flow processes, from initial capture to final presentation to the end user.

In addition, we will ensure that the types of metadata included in the flow are suitable for retrieval and presentation of content (consultation), and can be used for organizing (aggregation of) media assets based on, for example, domain semantics (e.g., election results) or time captured, and allow editors to select or reject items while giving them the ability to, e.g., include the reasons for their decisions back into the repository (adaptation).

The project foundations are the underlying semantic technologies required for associating well-defined semantics with media assets, where we build on contributions from the two research partners in the team, in particular:

- the canonical processes of media production [1] identifying separate processes within a media creation chain. Annotations created by human authors can thus automatically be identified during the process which they are made and can automatically be used with their specific meaning;
- NewsML G2 Architecture (NAR) and the IPTC NewsCodes [2] converted into Semantic Web languages to enable to enable processing by standard semantic web tool suites;
- a core ontology for multimedia (COMM) for associating metadata with non-textual media [3]. This allows the association of domain semantics with (parts of) a media asset in a sufficiently descriptive way that the information can be shared among different applications;
- Amico [4] for creating software wrappers to take output from existing news tools and convert it to explicit semantic descriptions, provide tools for enriching these semantic descriptions, and then take these 'high-semantic' descriptions and convert them to 'low-semantic' input into existing tools.

The formal expression of news operations in terms of canonical processes will allow the industry, as well as the lay user in the end, to disambiguate the overall process and it will help us developing meaningful and reusable interfaces using advanced semantic technologies to come to 'plug and play' wrappers that allows media and its associated metadata at a given time to be taken out of the workflow, enriched on-the-fly with our own tools and then put back in the chain of workflow again.

To minimize the risk of being unrealistic, we will collaborate intensively throughout the project, but in particular at the beginning of the project, with news project partners (VRT, AFP, Belga) to ensure we are solving relevant problems and that the solutions can be deployed in a production setting, in a way that:

- journalists will be able to make use of the infrastructure for improving their daily work (Belga, AFP, VRT);
- archivists will be able to make use of the infrastructure in the broadcast world (VRT);
- community portals (thus lay end users) will be able to make use of the infrastructure in a B2C scenario.

### State of the Art (SOTA)

There are a few European projects that try to tackle some of the problems we mentioned before. MESH [5] aims to extract, compare and combine content from multiple multimedia news sources, automatically create advanced personalized multimedia summaries, syndicate summaries and content based on the extracted semantic information, and provide end users with a 'multimedia mesh' news navigation system. NEWS [6] developed an automated multi-lingual news classification and annotation engine that is able to solve ambiguities and find matching events. Citizen Media [7] tries to enable any user at any location with any device to consume, author and publish his own content towards a networked A/V system. This system has to be able to handle a massive amount of user-generated content in different formats in real time, annotate and store this content in huge databases, search, retrieve, process and render all these pieces of user-generated content to create a new experience. However none of these projects try to capture the right metadata within the right process, thus missing vital information to (automatically) identify relationships within all the captured metadata of a news event, all needed to give a historic meaning to an individual news article, making it easy to search for relevant items in a specific time frame.

Commercial systems also still lack tools that give them sufficient support to make sense of individual news articles and give them a notion of how different news articles may be related to each other in a historical sense. SiloBreaker [8] is a compound news portal that has some semantics built into it trying to visualize related stories via a graph plug-in. It however lacks that much needed historical time perspective, as is the case with YouTube Warp [9], a new 'semantic' way of traversing the YouTube videos as neighboring vertices correlate to the same subject, and with Newstin [10] which has a nice java tree to navigate between the concepts, related concepts and the news.





### **B.3. Work Program & Feasibility (including the in-depth exploration of the mutual collaboration)**

To ensure the realization of the complete production chain we need to establish which processes are carried out in a news production environment, through consultations with news distributors, such as VRT, Belga, and AFP. We will identify stages in the news processing chain where we can convert existing outputs to semantic descriptions, identify where these can be enriched with extra descriptions, and where enriched descriptions can be converted back to inputs for processes down the line. We will also make an inventory of the different purposes for which the metadata are used in the existing production chain and how enriching descriptions upstream can enable new functionalities downstream, such as personalization based on domain semantics, integration with information on the Web, provenance information, historical perspective, etc.

We will design a metadata description model that allows us to represent the full context of the news information. This context includes the provenance information (thus a trust model), the rights associated with the news items (thus a future proof model) and all the background knowledge necessary for a full understanding of the event. This background knowledge can differ from one individual to another or, from one task to another (thus leading to a personalization model). Since we have the complete metadata chain, we can use the 'source' metadata throughout each process of the workflow to provide a trustworthy, extendable, user-centric model.

As a side effect these 'trusted' information sources can be aggregated using a push or pull (important for DRM & IPR) strategy. The available metadata will be used for processing to decide on the reliability of providers to provide new services. The same strategy can also be applied for consumer/non-professional and professional news content producers: once a producer of news media is considered trustworthy after a series of successfully accepted items, the applicable strategy should be shifted from push to pull.

While the metadata chain is intended to facilitate the producers' work methods, the available domain semantics using controlled vocabularies will be used within the project for a better:

- Semantic metadata integration: as mentioned above there's a need for new flexible models and corresponding conversion tools that deal with the heterogeneity in media, sources and formats. The further exploration of the canonical processes will be a big endorsement here;
- Semantic metadata enhancement: the generation of new relationships among media assets and the generation of links towards existing formalized knowledge on the web in order to provide more context for the reader;
- Organization of content: how to group together individual news items into events, how to find semantically similar news stories based on different types of metadata, e.g., domain semantics, photographer, historic meaning, etc. or how to rank the news items belonging to a cluster (event) in order to present the most representative one relative to the moment the event took place in the first time;
- Novel browsing methods, such as semantic facet browsing on media assets

While the main goal of this project is not to enhance the interface for the end-user directly, the purpose of the metadata chain is to 'collect' (aggregation) information during the lifetime of a media asset that can be used to enhance the ease of finding assets (consultation), organizing (adaptation) them and presenting them. For example, metadata should enable faster sifting of information related to a particular event and more organized presentation of different aspects of the event to the end user. The fact that news is strongly related to a certain moment or period in time could be used to enforce a hierarchical structure upon data pertaining to a single event, where each position functions as an indicator to the significance of the individual item. Item relevance could also be derived from the amount of user interest it generates over a given period of time. However, this will most likely push more sensational items in front.

The mutual collaboration within this project will be deepened as follows:

- role CWI:
  - design of appropriate metadata model (NewsML, COMM);
  - user interfaces;
  - user testing.
- role MMLab:
  - inventory of all processes and available metadata involved in the news production chain (in collaboration with VRT, Belga, and AFP);
  - inventory of 'new' metadata that could be added;
  - data conversion;
  - search optimization.
- roles for BOTH partners:
  - semantic metadata enhancement;
  - content organization;
  - standardization (IPTC, W3C, and EBU).

While our main goal is to provide an end-to-end environment for metadata processing in the domain of news, we will also ensure that the descriptions of News will be compatible with news standardization efforts. Both CWI's close collaboration with the IPTC standardization body concerning the standardization of NewsML, and MMLab's NewsML efforts (together with VRT & EBU in the long run) within the IBBT-PISA project will be a good starting point to study and expand the semantic possibilities of NewsML within the aforementioned standardization body. In addition, CWI and MMLab's connections with the standardization activities within W3C will also ensure the metadata descriptions used will be compatible with those being developed at W3C in the past via the MMSEM Incubator Group [1] and in the near future via the new Video On The Web Working Group [2]. CWI's expertise on MPEG-7 [3] and MMLab's standardization activities on MPEG-21 [4] & within JVT [5] will also be valuable assets within this project.

[1] : <http://www.w3.org/2005/Incubator/mmsem/>

[2] : <http://www.w3.org/2007/08/video/>

[3] : <http://www.chiariglione.org/mpeg/standards/mpeg-7/mpeg-7.htm>

[4] : <http://www.chiariglione.org/mpeg/standards/mpeg-21/mpeg-21.htm>

[5] : <http://www.itu.int/ITU-T/studygroups/com16/jvt/index.html>

## B.4. Projectplanning

Start Project	01/05/08	-
Milestone 1	01/05/09	Inventory of all processes and available metadata involved in the news production chain, and the 'new' metadata that could be added
Milestone 2	31/12/09	Multimedia ontology infrastructure (Blue print)
	30/05/10	Report on news content organization
	30/07/10	Multimedia ontology infrastructure (Iteration 2)
Milestone 3	30/07/10	Preliminary prototype novel interface designs
	30/09/10	Report on news content enhancement
Milestone 4	31/12/10	Multimedia ontology infrastructure (Final)
Milestone 5	30/09/11	Design and Implementation of novel user interfaces
	31/12/11	Report on User Testing
	30/04/12	Report on Standardization activities (Final)
End of project	30/04/12	Final software + 2 PhD theses
Scientific publications	during project	Average of 3 (joint) publications per year

## B.5. Possible interaction with other themes

The Niagara project has a link to all other themes. Within theme 2 our results of metadata enrichment could feed new search & presentation paradigms that will be tailored knowing the results of the user scenario's of different user groups on how to optimize personalization of access to audio-visual material in general. The results of theme 3 should be incorporated as an extra metadata stream within our metadata federation framework, thus enhancing again these new search & presentation paradigms to enable finding/adding even more relationships amongst (meta)data. Theme 4 will give us hints on how to deal with metadata which have DRM and/or IPR issues raised.

## Deel C. Valorisatie en commercialisatie van de projectresultaten

### C.1. Economic/social added value in Flanders & the Netherlands

Voor het geheel van het project (alle partners samen)

The economic and social value within Flanders, the Netherlands and even Europe could be very significant. Different types of user groups will have an improved quality of experience using these enhanced metadata paradigms, e.g.:

- journalists will be able to make use of the infrastructure for improving their daily work (Belga, AFP, VRT);
- archivists will be able to make use of the infrastructure in the broadcast world (VRT);
- community portals (thus lay end users) will be able to make use of the infrastructure in a B2C scenario.

Both VRT and even AFP (member of the IPTC NewsML standardization committee) and EBU have not only mentioned their interest in this project, but are also willing to share their thoughts, knowledge and infrastructure within a test environment.

## Deel D. Algemene inlichtingen

### D.1. Inlichtingen over Stichting Centrum voor Wiskunde en Informatica (Nederland)

Partner	Stichting Centrum voor Wiskunde en Informatica
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Identification of the partner (a few lines) for marketing purposes

CWI (<http://www.cwi.nl/about/>) is the national research institute for mathematics and computer science in the Netherlands. The mission of CWI is twofold:

- to perform frontier research in mathematics and computer science;
- to transfer new knowledge in these fields to society in general and trade and industry in particular.

The data explosion is one of the four themes which motivate research at the institute. This explosion in the amount of digital data confronts society with new questions. How can relevant and compact information be found from a flood of data? There is a significant need for models, methods and techniques that allow data to be tamed, studied and exploited. News is one of the areas where tools and techniques developed at CWI can be applied.

#### D.1.1. Algemene gegevens m.b.t. de juridische verantwoordelijke entiteit

Naam	Stichting Centrum voor Wiskunde en Informatica
Officiële vestigingsplaats	Amsterdam
Feitelijk werkadres	Kruislaan 413, 1089 SJ Amsterdam
Administratieve gegevens	Projectleider: Lynda Hardman, tel +31 20-5924147 Projectbeheer en administratie: Margriet Brouwer, tel +31 20-5924253 Email: Lynda.Hardman@cwi.nl Email: Margriet.Brouwer@cwi.nl

Indien de juridisch verantwoordelijke entiteit niet overeenstemt met de operationele entiteit, geef dan eveneens info over de operationeel verantwoordelijke entiteit

Naam	
Adres	
Ondernemingsnummer of nr. KvK indien van toepassing	

## D.1.2. Bijkomende contactgegevens

Contractbeheerder	
Naam en titel	Margriet Brouwer (contactgegevens zie bovenstaand)

### D.1.3. Research Activities

While people have access to huge amounts of information, they typically need only a very limited subset of it to carry out their current task. In addition, with the introduction of data repositories with potentially expandable schema (for example, those available in knowledge repositories on the Semantic Web), the core challenge is to find and present relevant subsets of these for a particular end user. Our goal is to support human users in obtaining the correct information, in the appropriate amount, relevant to the task at hand and presented in the appropriate way. This should minimize the cognitive overhead of the user, thus contributing to minimizing the time for a user to complete her task.

Our aim is to develop methods to explore and confirm appropriate models of storage, selection, organization and presentation of information to the user.

Our methods are based on developing solutions for linking descriptive semantics with the media assets that contain the information interpretable by the end user. Tools include Semantic Web knowledge description languages and associated tools. In parallel, empirical studies are used to understand the needs of users with their specific information needs. Both qualitative and quantitative evaluations are carried out. Our current emphasis is on expert access to cultural heritage information owned by museums (MultimediaN Eculture project and on end-user access to news content owned by news providers (NewsML work carried out in the context of K-Space).

#### Research history

CWI's Semantic Media Interfaces group has been involved with the development of models and authoring systems for multimedia and hypermedia since the early 1990's. Results of this work include the Amsterdam Hypermedia Model, contributions to the W3C SMIL 1.0, SMIL 2.0, and XHTML recommendations, the hypermedia authoring system GRiNS, the CWI spin-off company Oratrix. More recent work resulted in the development of the multimedia transformation engine Cuypers and the rhetorical video documentary engine Vox Populi.

Members of the group have been active in W3C's Synchronized Multimedia Working Group, ISO's MPEG7 DDL Working Group and W3C's Multimedia Semantics Incubator Group.

### D.1.4. Publication - list

All CWI publications from the period 2005-2007, according to following categories:

#### 1. 'peer-reviewed' journals

1. K. Falkovych, F. Nack, (2006), Context Aware Guidance for Multimedia Authoring: Harmonizing Domain and Discourse Knowledge Tools, *Multimedia Systems Journal*, Special issue on Multimedia System Technologies for Educational Purposes, 11, 226--235.
2. Z. Obrenovic, D. Starcevic, (2006), Adapting the Unified Software Development Process for User Interface Development, *Computer Science and Information Systems*, 3, 33--52.
3. G. Stamou, J. van Ossenbruggen, J. Z. Pan, G. Schreiber, (2006), Multimedia Annotations on the Semantic Web, *IEEE Multimedia*, 13, 86--90.
4. D. C. Bulterman, L. Hardman (2005). Structured Multimedia Authoring. *ACM Trans. Multimedia Comput. Commun. Appl.* 1(1), 89-109.
5. F. Nack, J. van Ossenbruggen, L. Hardman (2005). That Obscure Object of Desire: Multimedia Metadata on the Web (Part II). *IEEE Multimedia* 12(1), 54-63.
6. Zeljko Obrenovic and Dragan Gasevic. Open Source Software: All You Do Is Put It Together. In: *IEEE Software* (volume 24, number 5, pages 86-95), 2007

## 2. conference proceedings

1. Richard Arndt, Raphaël Troncy, Steffen Staab, Lynda Hardman, and Miroslav Vacura. COMM: Designing a Well-Founded Multimedia Ontology for the Web. In: The Semantic Web - ISWC/ASWC 2007 (volume 4825, pages 30-43), Lecture Notes in Computer Science, November 11-15, 2007, Busan, Korea
2. Henriette Cramer, Vanessa Evers, Maarten Van Someren, Bob Wielinga, Sam Besselink, Lloyd Rutledge, Natalia Stash, and Lora Aroyo. User Interaction with User-Adaptive Information Filters. In: Proceedings of the 12th International Conference on Human-Computer Interaction, July 22-27, 2007, Beijing, China
3. Lloyd Rutledge, Lora Aroyo, Brussee, Natalia Stash, Yiwen Wang, Henriette Cramer, Vanessa Evers, and Satyan Ramlal. Recommendation with Semantics for Cultural Heritage. In: International Workshop on Personalization Enhanced Access to Cultural Heritage, June 25, 2007, Corfu, Greece
4. Zeljko Obrenovic and Jacco van Ossenbruggen. Web browser accessibility using open source software. In: Proceedings of the 2007 international cross-disciplinary conference on Web accessibility (W4A), ACM International Conference Proceeding Series, Vol. 225 (pages 15-24), May, 7-8, 2007, Banff, Canada
5. Pablo Cesar, Dick C.A. Bulterman, Zeljko Obrenovic, Julien Ducret, and Samuel Cruz-Lara. An Architecture for Non-intrusive User Interfaces for Interactive Digital Television. In: Proceedings of the 5th European Conference EuroITV 2007, Lecture Notes in Computer Science LNCS 4471, Springer (pages 11-20), May, 24-25, 2007, Amsterdam, The Netherlands
6. Jan Wielemaker, Michiel Hildebrand, and Jacco van Ossenbruggen. Prolog as the Fundament for Applications on the Semantic Web. In: Proceedings of the ICLP'07 Workshop on Applications of Logic Programming to the Web, Semantic Web and Semantic Web Services (ALPSWS2007), 2007, Porto, Portugal
7. Zeljko Obrenovic, Raphaël Troncy, and Lynda Hardman. Vocabularies for Description of Accessibility Issues in Multimodal User Interfaces. In: Ielka van der Sluis et al. (eds.): MOG 2007- CTIT Proceedings of the Workshop on Multimodal Output Generation (pages 117-128), January, 25-26, 2007, Aberdeen, UK
8. Lora Aroyo, Rogier Brussee, Lloyd Rutledge, Peter Gorgels, Natalia Stash, and Yiwen Wang. Personalized Museum Experience: The Rijksmuseum Use Case. In: Museums and the Web 2007, April 11-14, 2007, San Francisco, USA,
9. Jacco van Ossenbruggen, Alia Amin, Lynda Hardman, Michiel Hildebrand, Mark van Assem, Borys Omelayenko, Guus Schreiber, Anna Tordai, Victor de Boer, Bob Wielinga, Jan Wielemaker, Marco de Niet, Jos Taekema, Marie-France van Orsouw, and Annemiek Teasing. Searching and Annotating Virtual Heritage Collections with Semantic-Web Techniques. In: Museums and the Web 2007, April 11-14, 2007
10. G. Flouris, Z. Huang, J. Z. Pan, D. Plexousakis, H. Wache, (2006), Inconsistencies, Negations and Changes in Ontologies, in Proceedings, The Twenty-First National Conference on Artificial Intelligence and the Eighteenth Innovative Applications of Artificial Intelligence Conference, July 16-20, 2006, Boston, Massachusetts, USA, no. AAAI-06 in AAAI.
11. L. Hardman, J. van Ossenbruggen, (2006), Creating Meaningful Multimedia Presentations, in IEEE International Symposium on Circuits and Systems, no. CH37717 in IEEE.
12. M. Hildebrand, J. van Ossenbruggen, L. Hardman, (2006), /facet: A Browser for Heterogeneous Semantic Web Repositories, in The Semantic Web - ISWC 2006, no. 4273 in LNCS, 272--285.
13. G. Schreiber, A. Amin, M. van Assem, V. de Boer, L. Hardman, M. Hildebrand, L. Hollink, Z. Huang, J. van Kersen, M. de Niet, B. Omelayenjko, J. van Ossenbruggen, R. Siebes, J. Taekema, J. Wielemaker, B. Wielinga, (2006), MultimediaN E-Culture Demonstrator, in The Semantic Web - ISWC 2006, no. 4273 in LNCS, 951--958.
14. U. Straccia, R. Troncy, (2006), Towards Distributed Information Retrieval in the Semantic Web: Query Reformulation Using the oMAP Framework, in Proceedings of the 3rd European Semantic Web Conference (ESWC 06), no. 4011 in LNCS, Budva, Montenegro, 378--392.



15. R. Troncy, W. Bailer, M. Hausenblas, P. Hofmair, R. Schlatte, (2006), Enabling Multimedia Metadata Interoperability by Defining Formal Semantics of MPEG-7 Profiles, in Semantic Multimedia - SAMT 2006, no. 4306 in LNCS, Athens, Greece, 41--55.
16. A. Amin, J. Wang, (2006), Affective Speech for Social Communication: Implementation Challenges in Text-to-Speech for Short Messages, in CHI 2006 Workshop on Mobile Social Software, no. 0 in ACM CHI Workshops, Montreal, Canada, 6--9.
17. S. Bocconi, F. Nack, L. Hardman, (2005), Using Rhetorical Annotations for Generating Video Documentaries, in Proceedings of the IEEE International Conference on Multimedia and Expo (ICME) 2005.
18. K. Falkovych, F. Cena, F. Nack, (2006), Combining Coherence and Adaptation in Discourse-Oriented Hypermedia Generation, in Proceedings of the Fourth International Conference on Adaptive Hypermedia and Adaptive Web-Based Systems (AH2006), no. 4018 in LNCS, Dublin, Ireland, 274--278.
19. S. Bocconi, F. Nack, L. Hardman (2005). Supporting the Generation of Argument Structure within Video Sequences. Proceedings of the sixteenth ACM Conference on Hypertext and Hypermedia 2005, 75-84.
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21. L. Rutledge, J. van Ossenbruggen, L. Hardman (2005). Making RDF Presentable. Integrated Global and Local Semantic Web Browsing, Proceedings WWW2005, 199-206.
22. K. Schwarz, T. Kouwenhoven, V. Dignum, J. van Ossenbruggen (2005). Supporting the decision process for the choice of a domain modeling scheme. Formal Ontologies Meet Industry (FOM/2005), 6 pages.
23. Jacco van Ossenbruggen and Lynda Hardman. From Syntactic Towards Semantic-driven Document Transformations. In: Creation, Use and Deployment of Digital Information (Edited by Herre van Oostendorp, Andrew Dillon, and Leen Breure) (pages 55-72), Erlbaum, March 2005

### 3. book chapters

1. Z. Huang, F. van Harmelen, A. ten Teije, (2006), Reasoning with Inconsistent Ontologies: Framework, Prototype, and Experiment, in Semantic Web Technologies: Trends and Research in Ontology-based Systems, J. Davies, R. Studer, P. Warren, eds., John Wiley and Sons, 71--93.
2. Z. Obrenovic, D. Starcevic, E. Jovanov, (2006), Multimodal Presentation of Biomedical Data, in Wiley Encyclopedia of Biomedical Engineering, M. Akay, ed., John Wiley and Sons.
3. Z. Obrenovic, D. Starcevic, E. Jovanov, (2006), Virtual Instrumentation, in Wiley Encyclopedia of Biomedical Engineering, M. Akay, ed., John Wiley and Sons.

### 4. PhD theses

1. S. Bocconi, (2006). Vox Populi: generating video documentaries from semantically annotated media repositories, TUE, 30 November. Supervisor: L. Hardman, associate supervisor: F.-M. Nack.

- 1) publicaties in 'peer-reviewed' tijdschriften
- 2) bijdragen aan conferenties (proceedings)
- 3) bijdragen in boeken (hoofdstukken)
- 4) doctoraatsthesisen

## D.2. Inlichtingen over Interdisciplinair instituut voor BreedBand Technologie – Multimedia Lab (Vlaanderen)

Partner	Interdisciplinair instituut voor BreedBand Technologie – Multimedia Lab
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Identificering van de partner in enkele regels ten behoeve van marketing doeleinden

Multimedia Lab (MMLab) is a young research group within Ghent University, Belgium (Faculty of Engineering, Department of Electronics and Information Systems). MMLab was founded in 2001. This lab has a wide range of activities, including fundamental/basic research, applied research, and contract-based research with industrial partners. Besides, MMLab is doing scientific consultancy for both industrial and governmental partners. MMLab has four main domains of expertise: advanced video applications, mobile multimedia applications, metadata technology, and standardization.

### D.2.1. Algemene gegevens m.b.t. de juridische verantwoordelijke entiteit

Naam	Universiteit Gent
Adres exploitatiezetel	Sint-Pietersnieuwstraat 25, 9000 Gent
Adres maatschappelijke zetel	Sint-Pietersnieuwstraat 25, 9000 Gent
Administratieve gegevens	RECTORAAT – vice-rector prof. dr. Luc Moens

Indien de juridisch verantwoordelijke entiteit niet overeenstemt met de operationele entiteit, geef dan eveneens info over de operationeel verantwoordelijke entiteit

Naam	Prof. dr. ir. Van de Walle
Adres	Gaston Crommenlaan 8 bus 201 9050 Ledeborg
Ondernemingsnummer	

### D.2.2. Bijkomende contactgegevens

Contractbeheerder	
Naam en titel van vertegenwoordiger van de onderneming	

### D.2.3. Onderzoeksactiviteiten

#### Geavanceerde videotoeepassingen

- Ontwikkeling en uitbuiting van (nieuwe) algoritmes voor (schaalbare) videocompressietechnieken
- Bewegingsestimatie en -compensatie
- ROI-gebaseerde videocompressie (Region of Interest)
- Adaptatie van multimediatechniek met betrekking tot variërende gebruikersomgevingen en dit op volgende niveaus: Semantisch, Structureel, Signaal
- Ontwikkeling van iTV toepassingen (o.a. gebaseerd op MHP, het Multimedia Home Platform)
- Signaalverwerking (o.a. transcoding)
- Beeldverwerking (o.a. shot segmentatie)
- Beeldanalyse (o.a. textuurclassificatie, voorgrond/achtergrond modellering)

#### Mobiele multimediatoeepassingen

- reductie van de impact van netwerkverlies op de kwaliteit van multimediapresentaties (o.a. adaptieve codering/decoding met betrekking tot variërende netwerkkenmerken)
- weergave van multimediatechniek op mobiele terminals met beperkte hulpbronnen
- transparante overdracht van multimediasessies tussen verschillende toestellen (session mobility)
- hardware/software co-design van geïntegreerde multimediasystemen

#### Metadata

- Ontwikkeling en beschrijving van content en context door middel van (nieuwe) metadatamodellen in multimediasystemen
- Het nemen van beslissingen rond adaptatie van multimediale stromen
- Objectherkenning en kenmerkextractie
- Multimedia Content Management - Media Asset Management

#### Standaardisatie op gebied van multimediasystemen en -toepassingen

- Digital Item Declaration, Digital Item Adaptation, Digital Item Processing (in de context van MPEG-21 standaardisatie)
- MPEG-4 Advanced Video Coding (H.264/AVC)
- Scalable Video Coding (SVC)
- MMSEM (Multimedia Semantics) – W3C Web2.0/3.0
- Archivering en dissimulatie van digitale multimediaobjecten

(actief) participant van volgende standaardisatie consortia: Actief contribuant in MPEG, W3C, JVT, VQEG. Opvolging in DVB, IFTA

De werkzaamheden voor het Niagara-project sluiten aan bij MMLabs Metadata- en Standaardisatie-activiteiten op het gebied van 'semantic web'-technologieën en search-technologieën. Meer in het bijzonder sluit het onderzoek aan bij het IBBT-project PISA. Binnen het onderzoek naar het automatiseren van de analyse en produceren van audiovisuele media, zorgt MMLab mee voor het onderliggende metadatamodel en voor een applicatie die dat researchmodel aan de werkelijkheid toetst voor dramaproducties. Verder wordt er met de VRT heel nauw samengewerkt in het kader van de nieuwsgaring, meer bepaald het beschrijven van alle items in NewsML en het gemakkelijk indexeren en opzoekbaar maken van al deze nieuws resources. Dit bilateraal researchproject wordt dan ook aangegrepen om ons veel belovend fundamenteel onderzoek hieromtrent verder te zetten en onze prille bilaterale relatie, dankzij gezamenlijk werk binnen W3C, met het CWI verder te kunnen uitbouwen.

## D.2.4. Publicaties - lijst

OPM vooraf: de onderstaande publicatielijsten werden beperkt tot publicaties sinds 2005. Een volledige publicatielijst van de onderzoeksgroep MMLab kan geraadpleegd worden via de website <http://multimedialab.elis.ugent.be>.

### Publicaties in 'peer-reviewed' tijdschriften

1. [Hendrik Eeckhaut](#), [Harald Devos](#), [Peter Lambert](#), [Davy De Schrijver](#), [Wim Van Lancker](#), [Vincent Nollet](#), [Prabhat Avasare](#), [Tom Clerckx](#), [Fabio Verdicchio](#), [Mark Christiaens](#), [Peter Schelkens](#), [Rik Van de Walle](#) and [Dirk Stroobandt](#). Scalable, Wavelet-Based Video: from Server to Hardware-Accelerated Client. IEEE Transactions on Multimedia. IEEE. Vol. 9. 2007. 1508-1519.
2. [Guillaume Crevecoeur](#), [Hans Hallez](#), [Peter Van Hese](#), [Yves D'Asseler](#), [Luc Dupré](#) and [Rik Van de Walle](#). Influence of noise on EEG source analysis using space mapping techniques. International Journal of Applied Electromagnetics and Mechanics? Proceedings of the twelfth International Symposium on Interdisciplinary Electromagnetic, Mechanic and Biomedical Problems. Vol. 25. 2007. 383-387.
3. [Joseph A.I. Thomas-Kerr](#), [Ian S. Burnet](#), [Christian H. Ritz](#), [Sylvain Devillers](#), [Davy De Schrijver](#) and [Rik Van de Walle](#). Is That a Fish in Your Ear? A Universal Metalanguage for Multimedia. IEEE Multimedia. Panchanathan, S.; Boll, S.; Ellis, D. IEEE Computer Society. Visionary Media. Vol. 14. 2007. 72-77.
4. [Davy De Schrijver](#), [Wesley De Neve](#), [Koen De Wolf](#), [Robbie De Sutter](#) and [Rik Van de Walle](#). An optimized MPEG-21 BSDL framework for the adaptation of scalable bitstreams. Journal of Visual Communication and Image Representation. Zeevi, Y.Y.; Jay Kuo, C.-C. Elsevier. Vol. 18. 2007. 217 - 239.
5. [Robbie De Sutter](#), [Koen De Wolf](#), [Sam Lerouge](#) and [Rik Van de Walle](#). Lightweight Object Tracking in Compressed Video Streams Demonstrated in Region-of-Interest Coding. EURASIP Journal on Advances in Signal Processing. Hindawi Publishing Corporation. Vol. 2007. 2007. 16.
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7. [Robbie De Sutter](#), [Sam Lerouge](#), [Peter De Neve](#), [Christian Timmerer](#), [Herman Hellwagner](#) and [Rik Van de Walle](#). Comparison of XML serializations: cost benefits versus complexity. Multimedia Systems. Springer Berlin . Vol. 12. 2006. 101-115.
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9. [Peter Lambert](#), [Davy De Schrijver](#), [Davy Van Deursen](#), [Wesley De Neve](#), [Yves Dhondt](#) and [Rik Van de Walle](#). A Real-Time Content Adaptation Framework for Exploiting ROI Scalability in H. 264/AVC. Lecture Notes in Computer Science. Blanc-Talon, J.; Philips, W.; Popescu, D.; Scheunders, P. Springer. 2006. 442-453.
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11. [Robbie De Sutter](#), [Stijn Notebaert](#) and [Rik Van de Walle](#). Evaluation of Metadata Standards in the Context of Digital Audio-Visual Libraries. Lecture Notes in Computer Science. Gonzalo, J; Felisa Verdejo, M.; Thanos C.; Carrasco, C. Springer. Vol. 4172. 2006. 220-231.

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21. [Steven Staelens](#), [Michel Koole](#), [Stefaan Vandenberghe](#), [Yves D'Asseler](#), [Ignace Lemahieu](#) and [Rik Van de Walle](#). The Geometric Transfer Function for a Slat Collimator Mounted on a Strip Detector. IEEE Transactions on Nuclear Science. IEEE. Vol. 52. 2005. 708-713.
22. [Frederik De Keukelaere](#), [Saar De Zutter](#) and [Rik Van de Walle](#). MPEG-21 Digital Item Processing. IEEE Transactions on Multimedia. Vol. 7. 2005. 427-434.

#### Bijdragen aan conferenties (proceedings)

1. [Davy Van Deursen](#), [Sarah De Bruyne](#), [Wim Van Lancker](#), [Wesley De Neve](#), [Davy De Schrijver](#), [Hermann Hellwagner](#) and [Rik Van de Walle](#). MuMiVA: a Multimedia Delivery Platform using Format-agnostic, XML-driven Content Adaptation. Proceedings of the 9th International Symposium on Multimedia. Kellenberger, P. IEEE Computer Society. 2007. 131 -138.
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- Talon, J.; Philips, W.; Popescu, D.; Scheunders, P. Springer - Verlag. Vol. 4678. 2007. 652 - 662.
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  5. [Stefaan Mys](#), [Jurgen Slowack](#), [Jozef Skorupa](#), [Peter Lambert](#) and [Rik Van de Walle](#). Dynamic Complexity Coding: Combining Predictive and Distributed Video Coding. Proceedings of the Picture Coding Symposium . SUVISOFT. 2007. 1 - 4.
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- 4) doctoraatsthesisen

### D.3. Intentieverklaring

De aanvraag is pas ontvankelijk zodra elke Partij een ondertekende intentieverklaring heeft ingediend.

Intentieverklaring IM-Pact **NIAGARA**

Ondergetekende	Stichting Centrum voor Wiskunde en Informatica (CWI)
Met maatschappelijke zetel gevestigd te	Amsterdam
RPR (Vlaanderen)	
Ondernemingsnummer/nr. KvK voor zover van toepassing	41198731 KvK Amsterdam
En hierbij rechtsgeldig vertegenwoordigd door	Prof.dr. J.K. Lenstra
Hierna <xx> genoemd	Algemeen directeur

Stichting Centrum voor Wiskunde en Informatica bevestigt de intentie te hebben om haar takenpakket in het kader van het project met als titel **NIAGARA** waarvan zij heeft kennis genomen, en verder het project genoemd, zoals beschreven in het projectvoorstel uit te voeren in samenwerking met partner:

- Universiteit Gent

Stichting Centrum voor Wiskunde en Informatica aanvaardt dat prof. dr. Lynda Hardman van de Stichting Centrum voor Wiskunde en Informatica optreedt als woordvoerder-coördinator in het project Nieuws AGgregeren, Aanpassen & RAadplegen (NIAGARA) ten aanzien van IBBT en ICTRegie.

Stichting Centrum voor Wiskunde en Informatica verklaart kennis te hebben genomen van en aanvaardt de modaliteiten die gelden voor de projecten zoals beschreven in de oproepdocumenten dd. 19 december 2007.

Stichting Centrum voor Wiskunde en Informatica verbindt zich vanaf heden tot een geheimhoudingsplicht over alle Vertrouwelijke Informatie die mogelijks tussen de partijen zal circuleren in het kader van het project tot op het ogenblik van ondertekening van de samenwerkingsovereenkomst. 'Vertrouwelijke Informatie' betekent alle informatie van eender welke aard en bekend gemaakt in eender welke vorm door een Partij aan eender welke andere Partij in verband met het project.

Stichting Centrum voor Wiskunde en Informatica verklaart kennis te hebben genomen van het op datum van ondertekening vigerende sjabloon voor samenwerkingsovereenkomsten en verbindt er zich toe om bij goedkeuring van het project te goeder trouw mee te werken aan de onderhandelingen en het afsluiten van een samenwerkingsovereenkomst voor dit project, rekening houdend met de in de sjabloon gevolgde principes.

Prof.dr. J.K. Lenstra

Directeur - CWI  
Datum:

## D.1. Intentieverklaring

De aanvraag is pas ontvankelijk zodra elke Partij een ondertekende intentieverklaring heeft ingediend.

Intentieverklaring IM-Pact **NIAGARA**

Ondergetekende	IBBT - MMLab
Met maatschappelijke zetel gevestigd te	Gent
RPR (Vlaanderen)	
Ondernemingsnummer/nr. KvK voor zover van toepassing	
En hierbij rechtsgeldig vertegenwoordigd door	Vice-rector prof. dr. Luc Moens en prof. dr. ir. Van de Walle
Hierna <xx> genoemd	

IBBT - MMLab bevestigt de intentie te hebben om haar takenpakket in het kader van het project met als titel **NIAGARA** waarvan zij heeft kennis genomen, en verder het project genoemd, zoals beschreven in het projectvoorstel uit te voeren in samenwerking met partner:

- Stichting Centrum voor Wiskunde en Informatica

IBBT - MMLab aanvaardt dat prof. dr. ir. Rik Van de Walle van IBBT – MMLab optreedt als woordvoerder-coördinator in het project Nieuws AGgregeren, Aanpassen & RAadplegen (NIAGARA) ten aanzien van IBBT en ICTRegie.

IBBT - MMLab verklaart kennis te hebben genomen van en aanvaardt de modaliteiten die gelden voor de projecten zoals beschreven in de oproepdocumenten dd. 19 december 2007.

IBBT - MMLab verbindt zich vanaf heden tot een geheimhoudings-plicht over alle Vertrouwelijke Informatie die mogelijks tussen de partijen zal circuleren in het kader van het project tot op het ogenblik van ondertekening van de samenwerkingsovereenkomst. 'Vertrouwelijke Informatie' betekent alle informatie van eender welke aard en bekend gemaakt in eender welke vorm door een Partij aan eender welke andere Partij in verband met het project.

IBBT - MMLab verklaart kennis te hebben genomen van het op datum van ondertekening vigerende sjabloon voor samenwerkingsovereenkomsten en verbindt er zich toe om bij goedkeuring van het project te goeder trouw mee te werken aan de onderhandelingen en het afsluiten van een samenwerkingsovereenkomst voor dit project, rekening houdend met de in de sjabloon gevolgde principes.

Prof. dr. ir. Van de Walle  
Groepsleider MMLab

Prof. dr. Luc Moens  
Vice-rector