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INTERDISCIPLINAIR INSTITUUT VOOR BREEDBANDTECHNOLOGIE

IPEA

Innovative Platform on Electronic Archiving

ACF Fair – Brussels, November 2005

Scope

- Digital archiving of multimedia data
  - initially: TV broadcasters
  - later: AV data of other sectors (e.g., arts)
- Different players
  - public / commercial sector
  - private sector
  - university / research facilities
- Question asked to IBBT
  - co-ordinate existing projects
  - initially: focus TV broadcasters

The IBBT?

- Flemish research center for interdisciplinary ICT research, founded 2004:
  - Network, content, legal, social, user
  - Demand-driven projects, co-funded by the IBBT (contributing knowledge and manpower, not cash)
  - Projects in cooperation with consortium of companies, aimed at developing one or more demonstrators…
- Total Funding: 18 mio €
- Domains: media, e-health, mobility, e-gov
- www.ibbt.be

IPEA in 1 Slide

- Co-ordinating an interdisciplinary research program about electronic archiving in the Flanders
  - what is the state-of-the-art?
  - analyze user requirements and social en cultural implications
  - define a standardized exchange metadata model
  - select AV formats
  - security aspects
  - architectural study & prototype
  - possible business cases
  - *interdisciplinary* research

Partners

- Companies
  - Videohouse (SME, Romain Landrie)
  - VMMa (commercial broadcaster, Jozef Mertens)
  - VRT (public broadcaster, André Saegerman)

- IBBT-research groups
  - Ghent University-Multimedia Lab (Rik Van de Walle)
  - Ghent University-MICT (Els De Bens)
  - K.U.Leuven-COSIC (Bart Preneel)
  - K.U.Leuven-CUO (Dirk De Grooff)
  - K.U.Leuven-ICRI (Jos Dumortier)
  - VUB-ETRO (Peter Schelkens)
  - VUB-SMIT (Caroline Pauwels)

Scale & Duration

- Scale
  - 36.5 man year
    - 6.9 industry, with 3.0 SME
    - 8.3 public sector
    - 21.3 IBBT-research groups
  - 50%-50% financing IBBT vs. other partners
- Duration
  - 2 years
  - 01/01/2005 – 31/12/2006

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work package 1

project management

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work package 2 + 3

state-of-the-art & user research

WP2: state-of-the-art electronic archiving

- Tasks
  - create overview of current actions / initiatives
    - study acceptance of digital archives
    - study existing use cases (e.g., “Beeld & Geluid”)
    - initiatives public and commercial broadcasters
    - metadata technologies / standards
    - architecture
    - government policies
    - legislation (e.g., privacy, security, DRM, …)
- Deliverables
  - state-of-the-art report
- Lead: Frank Mathys (VMMa)

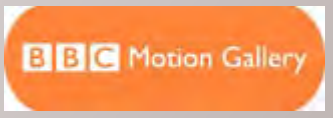
WP3: user research

- Tasks
  - analyze user requirements
    - professional users (e.g., broadcasters, production houses)
    - semi-professional users (e.g., education, cultural facilities, government, …)
    - domestic users
  - analyze social and cultural implications
- Deliverables
  - report on types of user requirements / expectance
  - report on usability research
  - (answers to) question of policymakers
- Lead: Els De Bens (Ghent University-MICT)

State-of-the-Art

- Description use cases
  - goal: inventory of existing archiving technologies at Flemish and important European broadcasters – media production houses
  - which cases?

D&D



State-of-the-Art

- General description
  - history
  - infrastructure of the archive (personnel, means, localization, …)
  - public? users?
  - current activity of the archive: what is it used for? What kind of material is being archived? How do they archive (which metadata, which search tools, …?)
- Architecture
  - metadata model, technical system and video formats
- Legal questions, data rights management

State-of-the-Art

- Main conclusions Flemish cases
  - different ways of archiving: ≠ databases, full-text search ↔ specific search, ≠ metadata, ≠ classifications, …
  - from ‘structure’ to ‘no structure at all’
  - complaints about ‘loss of tapes’, ‘deterioration of material’ and ‘lack of space’
  - small broadcasters (less financial means) wish to co-operate: one centralized archive with easy, fast and cheaper exchange
  - digital archiving: some initiatives (big organizations), but between broadcasters no consistency of procedure

State-of-the-Art

- Overview of existing metadata models , audiovisual formats and security specifications
  - theoretical description of their advantages and disadvantages
  - metadata models studied:
    - Dublin Core
    - IFLA model
    - MPEG-7
    - SMPTE Metadata Dictionary
    - FIAT-IFTA model
    - P/Meta
    - SMEF
    - TV-Anytime
    - Blue Order GVDM

State-of-the-Art

- 3. Overview of national and international studies and projects concerning electronic archiving, with a focus on moving pictures
  - national level

Digitale Archivering in Vlaamse Instellingen en Diensten

.PACKED
PLATFORM ARCHIVERING EN CONSERVERING VAN KUNSTCREATIES OP ELEKTRONISCHE EN DIGITALE DRAGERS

vrt

  - international level

PRIMAVERA

Presto Space

DISTRIBUTED MULTIMEDIA ARCHIVES FOR COOPERATIVE TV PRODUCTION
EUROMEDIA

ECHO
European CHronicles On-line

Presto preservation technology

IRST

amicitia

birth
Television Archive Basic

Cedars

Methodology

- Research into the needs and expectations with regard to the archiving of digital media and access to digital media by means of face-to-face-interviews
- professional users:

VIDEOHOUSE KANAAL Z VRT TV BRUSSEL VLAAMSE MEDIA MAATSCHAPPIJ

- users from different sectors:
  - cultural:
  - educational:
  - government: Ministerie van de Vlaamse Gemeenschap
  - advertising: UBA
  - Flemish residential user:

Questions

- Developing a clear set of questions:
- from general to specific
  - why/how do you want to use the archive?
  - how do you wish to pay for these services (and how much)?
  - what are the most important search criteria in order to consult the archive?
  - what are the technical requirements concerning searching, uploading, viewing (low-res/ high-res), editing, … ?
  - what kind of support is needed when using the archive?
  - what kind of information do you need about the rights management?
  - …

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work package 4

definition of a standardized metadata model

WP4: definition of a standardized metadata model

- Tasks
  - create overview of the actual used technology
    - VMMa
    - VRT
  - define & identify common metadata elements
  - research to acquire metadata in a (semi-) automatically way
  - special attention for juridical metadata
- Deliverables
  - semantic and syntax standardized metadata elements
  - develop and implement metadata acquisition techniques
- Lead: Rik Van de Walle (Ghent University-MMLab)

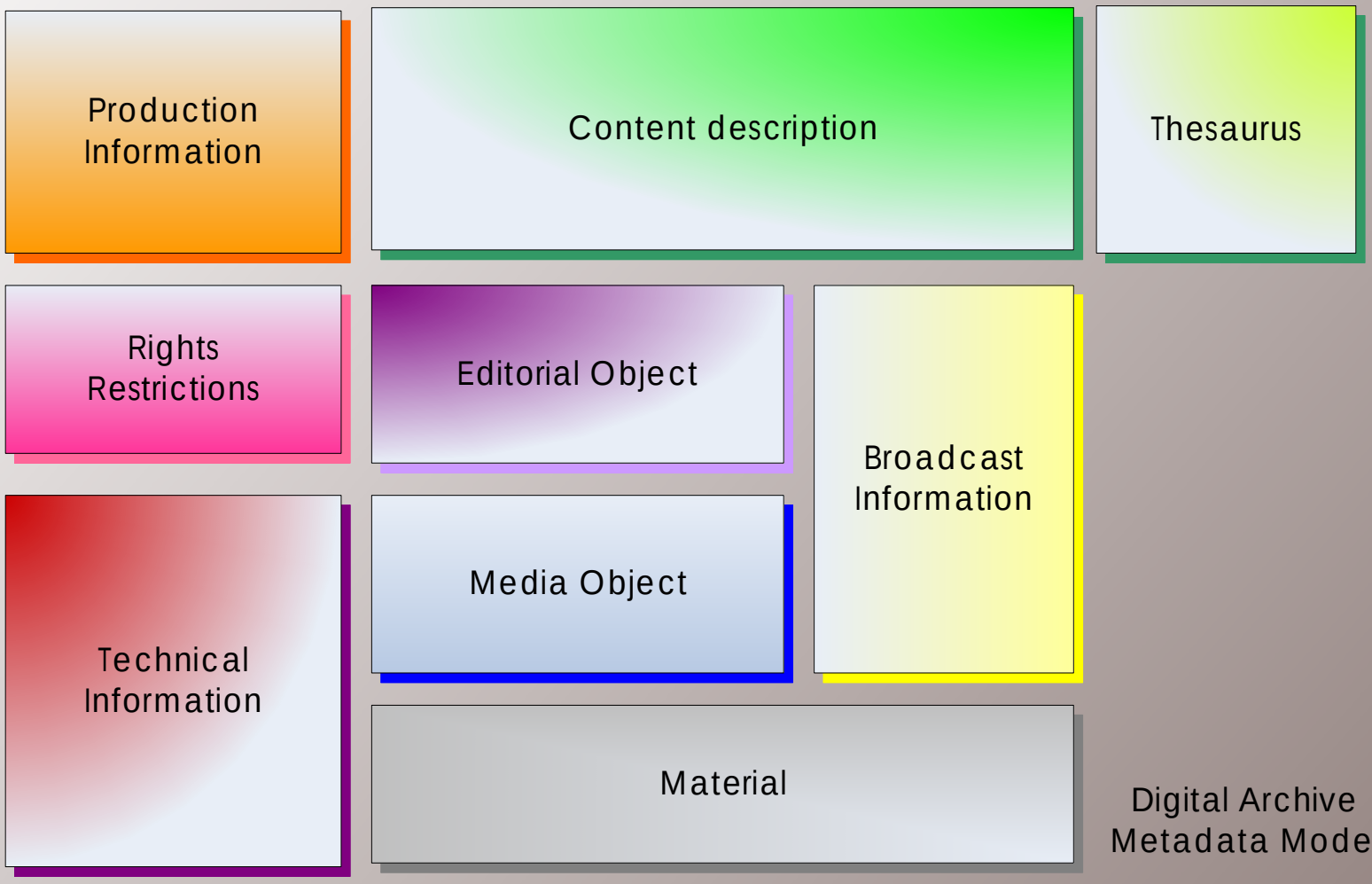
Overview existing metadata standards

Model	Developed	Intended	Description
Dublin Core	**World Wide Web consortium**	**Annotation of web pages**	**Unstructured list of elements Simplified Dublin Core: 15 elements, commonly known Qualified Dublin Core: 18 elements + refinements Used by Blue Order**
IFLA model	**International Federation of Library Associations and Institutions**	**Archive for books**	**4 layers hierarchy: Work–Expression–Manifestation–Item Link with a person or an organization Group according to concept, object or place**
MPEG-7	**Moving Picture Experts Group**	**B2B B2C**	**Schemas for the description of AV content: content description, content management, content organization, navigation & access, user interaction**
Metadata Dictionary	**Society of Motion Picture and Television Engineers**	**Archive for television B2B**	**Metadata elements are assigned to metadata classes: 1) identification, 2) administration, 3) interpretative, 4) parametric, 5) process, 6) relational and 7) spatial-temporal**

Overview existing metadata standards

FIAT/IFTA model	International Federation of Television Archives	Archive for television and movies	Minimum Data List (MDL): 22 elements Unstructured list of elements collected in 3 groups : identification, technical information and rights information
P/Meta	European Broadcasting Union	B2B	P/Meta Attributes: semantic of elements P/Meta Sets: functional grouping of elements P/Meta Values: definition of groups of values
Standard Media Exchange Framework	British Broadcasting Corporation	Production Distribution (Archiving)	Description of concepts about production and distribution of radio and television programs with much attention for rights management
TV-Anytime	European Telecommunications Standards Institute	B2C	TV-anytime = MPEG-7 profile This standard consists of 4 parts: descriptive metadata, technical metadata, user metadata and spatial temporal metadata
Generalized Video Data Model	Blue Order	Archive for AV content	Core Model: 3 layers hierarchy (Program, Item, and Sequence) Inventory Model: all possible metadata about a Program, an Item or a Sequence

Realizations: Internal Digital Archive



Digital Archive Metadata Model

Realizations: Exchange Model

- Exchange model: P/Meta IPEA profile
- Subset of P/Meta Version 1.1
- P/Meta = semantic framework for the exchange of metadata of audio visual content
- Exchange concepts: brand – program group – program – program item – media object
- Three cornerstones
  - Attributes Definition List: elementary element which holds information
  - Sets Definition List: grouping of attributes and sets
  - Value Definition List: lists of possible values

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work package 5

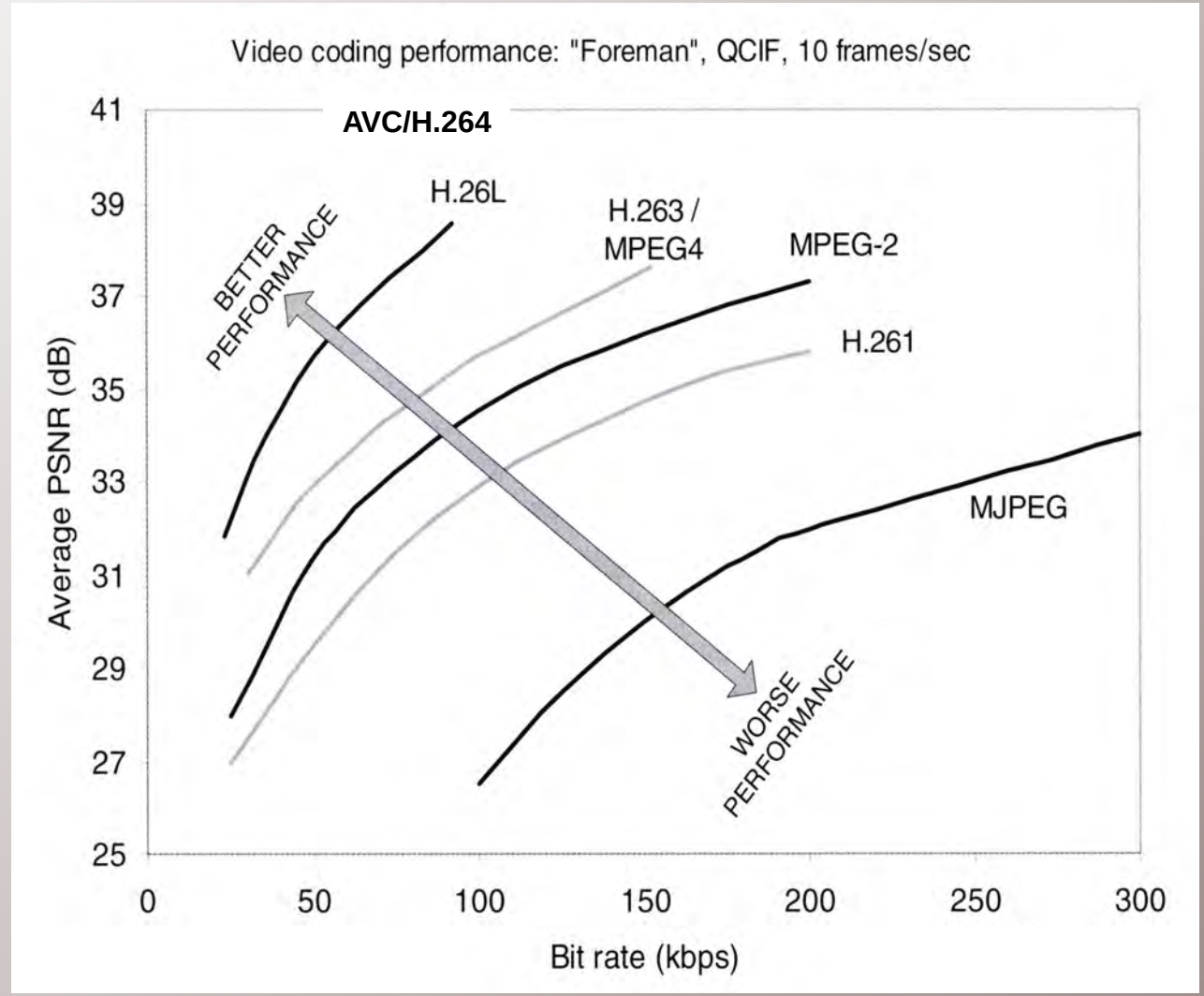
selection of the AV formats

WP5: selection of the AV formats

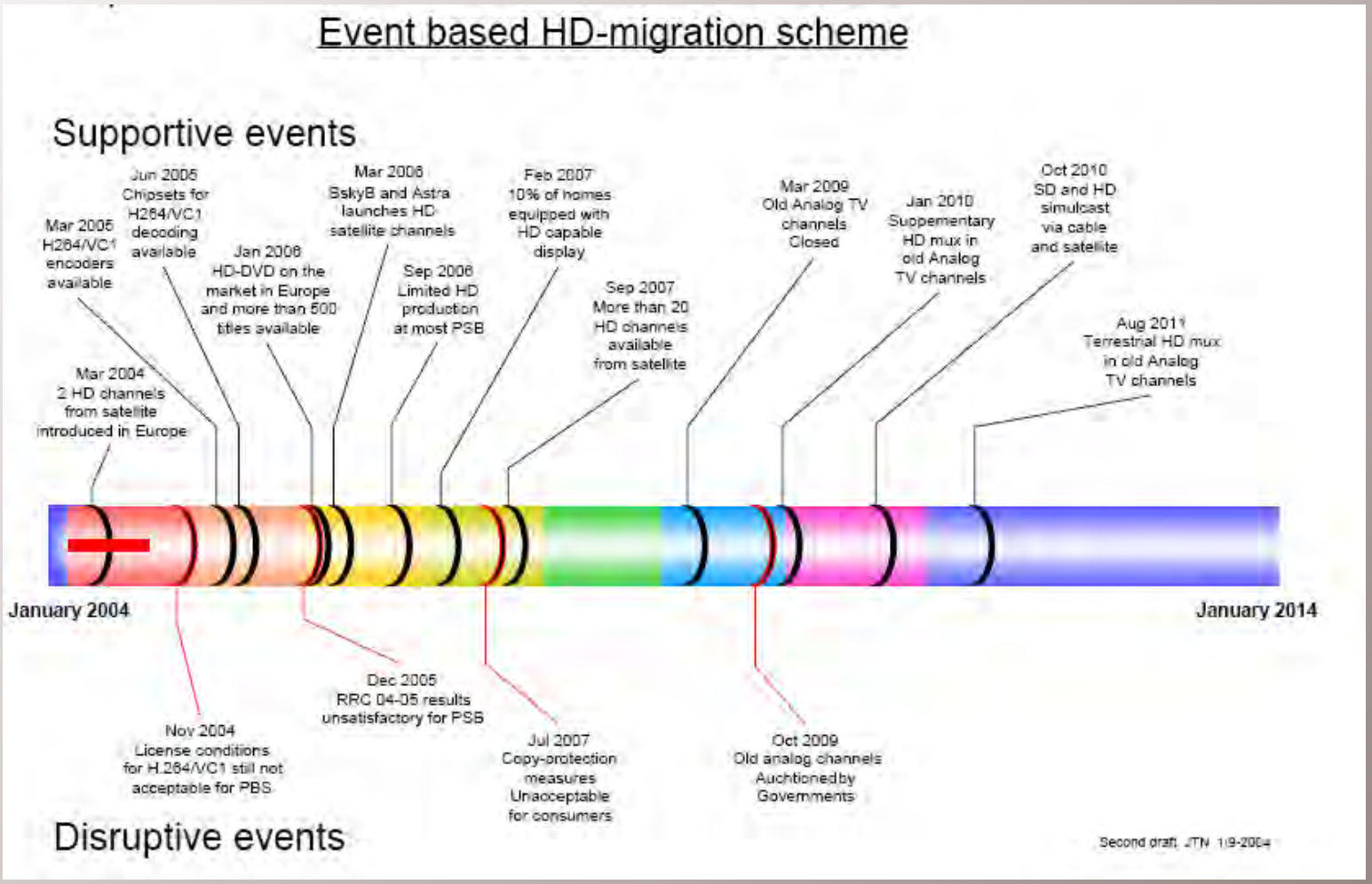
- Tasks
  - create overview of the actual technology
    - VMMa
    - VRT
  - comparison study and selection of AV formats
    - Subjective tests
    - Functional comparison
    - high resolution
    - low resolution (‘browse’ formats)
  - decide 1 AV format or multiple AV formats
  - decide on AV wrapper format
- Deliverables
  - overview existing AV formats
  - report comparison study
- Lead: Peter Schelkens (VUB-ETRO)

Available Technologies

[Richardson 2003]



Gap – HDTV



[EBU – tech 3298, "An EBU 'route map' to high definition (HD)", Geneve, October, 2004]

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work package 6

security aspects

WP6: security aspects

- Tasks – study:
  - integrate accessibility, distribution and use of digital objects to those objects
  - access control + privacy
  - security on content level (e.g., watermarking)
  - accountability of archiving services
  - e-payments and e-billing
  - cryptography + key management
- Deliverables:
  - integrated security model
  - legal evaluation of this security model
  - report on new or upcoming security techniques
- Lead: Bart Preneel (K.U.Leuven-COSIC)

Context

- Primary security issues: Professional users
  - access control to the digital archive
    - who has read access to the (hi-res) content
    - who can change (corrupt) metadata
    - problem: dynamic group, without pre-defined set of authentication mechanisms
  - integrity of the archive
    - how do we measure it
    - who is accountable for the integrity of the archive and the metadata
  - securing hi-res data in transit between professional users

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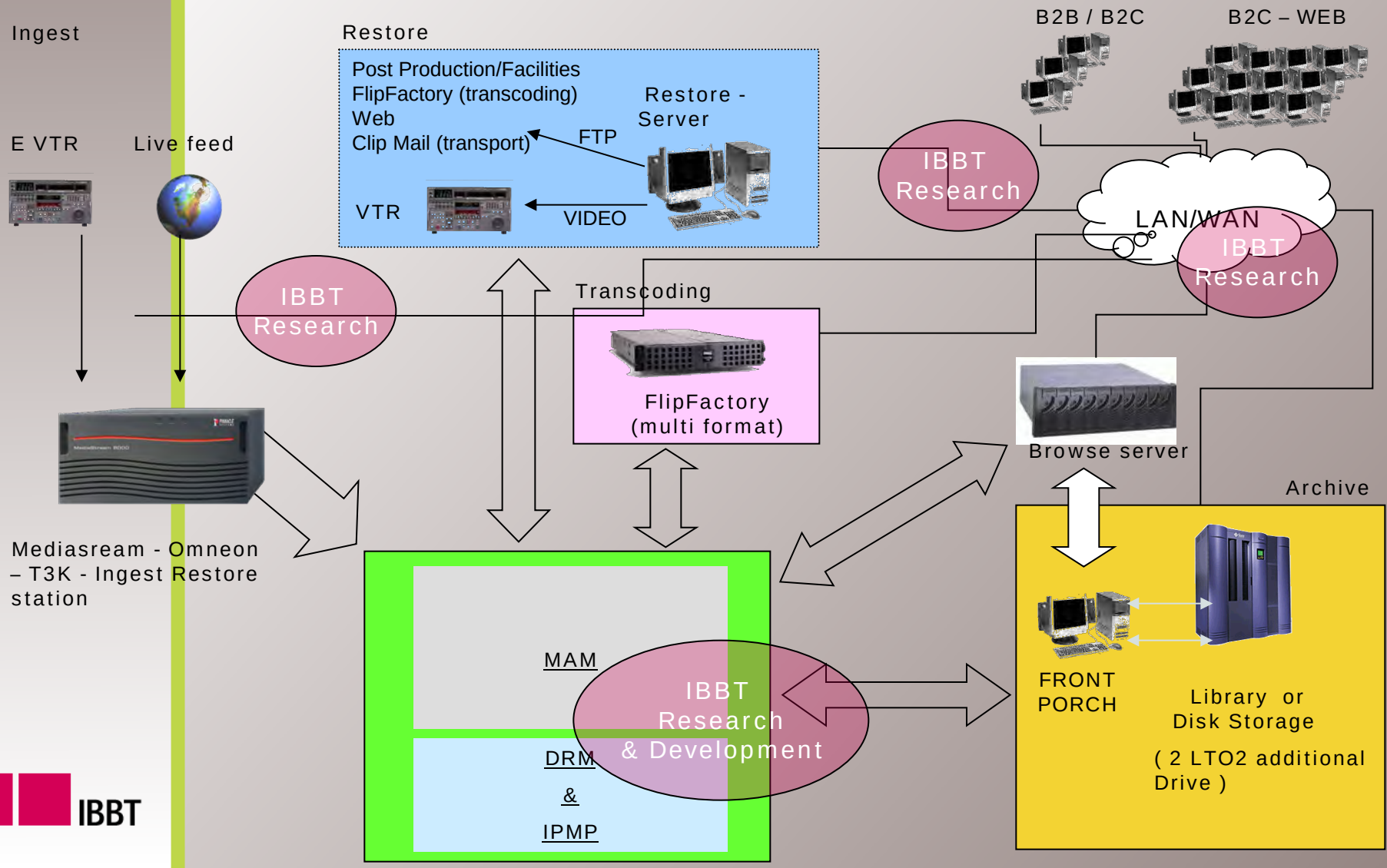
work package 7

architecture

WP7: architecture

- Tasks
  - select central vs. distributed data storage
  - select use of 1 vs. more portals
  - study security aspects
  - research and guidelines ‘disaster recovery’
  - research search engines
  - implement prototype at the IBBT test facility
- Deliverables
  - architectural description
  - implement a prototype at the IBBT Centre
  - report on the architecture
- Lead: André Saegerman (VRT)

WP7 - Basic Architecture



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work package 8

business model development

WP8: business cases

- Tasks
  - research possibilities economical valorization
  - develop concrete business cases
- Deliverables
  - analysis of the business cases
- Lead: Romain Landrie (Videohouse)

Existing business models

- Beeld en Geluid in the Netherlands:
  - central archiving system for the public broadcasters
- Incubateur Wallon:
  - common initiative from the Walloon government
  - the public broadcaster and the commercial
  - broadcasters in de Walloon region of Belgium
- BBC Motion Gallery:
  - portal with numerous shots from BBC and BBC news

Gaps & Goals

- Gaps
  - no central data-base of AV-content and no AV-exchange and archiving standards in the Flanders Region of Belgium
- Goals
  - common business model for AV-content archiving and AV-exchange in Flanders

Final conclusions

- Large interest in Flanders region of Belgium for a common archiving system

- The IPEA research project will deliver
  - a standardized metadata set to exchange AV content between broadcasters and AV archives
  - in a secure way
  - with technologically sound recommendation for usable AV formats
  - and enables optimized archive consumption for professional and semi-professional users
  - with economically sound concept
  - and demonstrated with a live test architecture

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The end…

THANK YOU!