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MPEG-21 concepts for personalized consumption of heterogeneous multimedia

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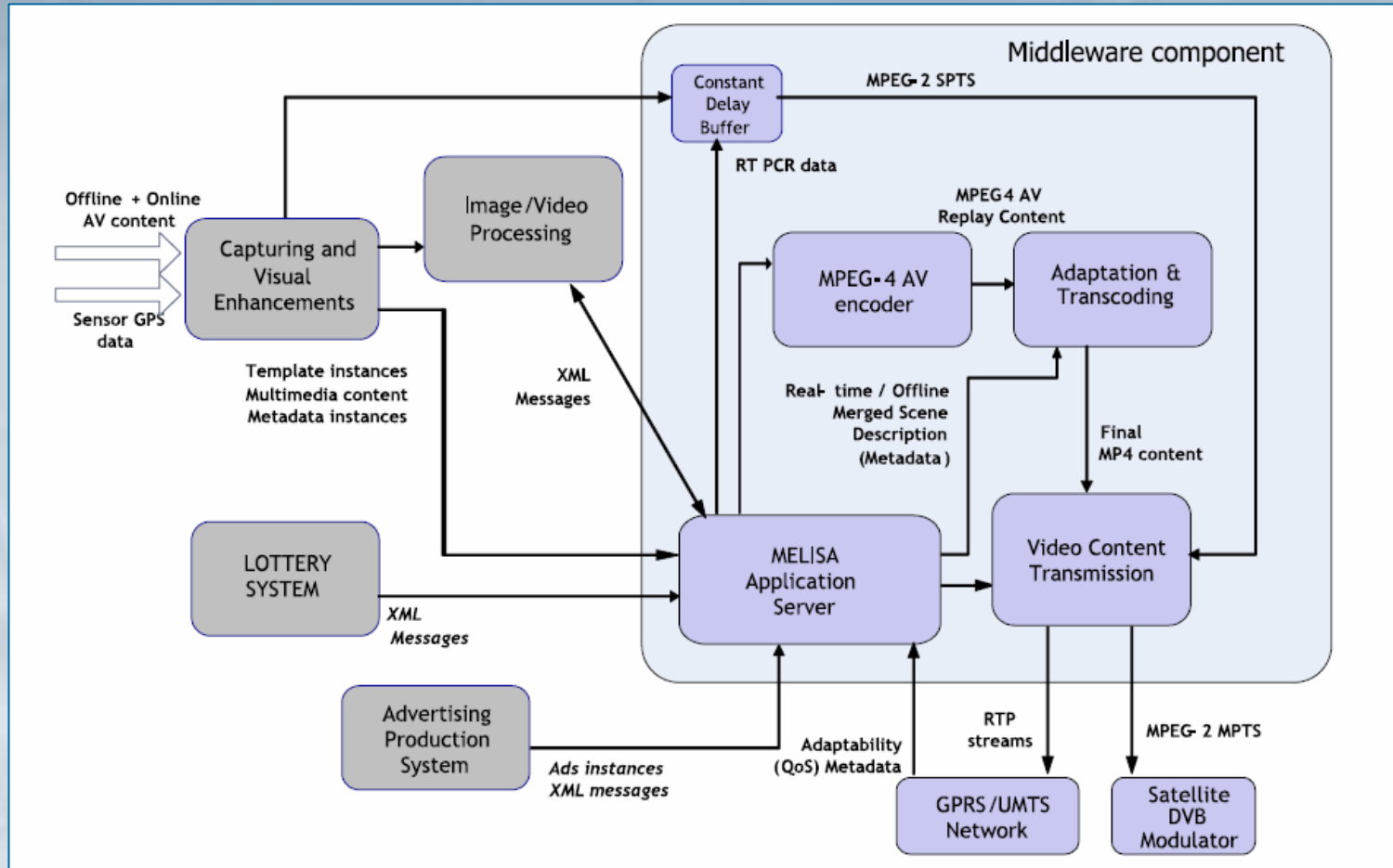
Introduction

- Digital TV
 - Sports broadcasting corporations
 - Content Providers
- Heterogeneous multimedia consumption
 - Seek new ways of integrating and presenting enhanced content to their customers
 - modifying their production cycle as less as possible
- MELISA system
 - Multi-Platform e- Publishing for Leisure and Interactive Sports Advertising system
 - Multimedia resource adaptation using MPEG 21 - DIA

Introduction

- Multi-user Profiling
 - User Categorization
 - User Profiles
 - Usage History
- Integrated TV entertainment experience
 - Stereotyped User Weights
 - Extracted profile Information

MELISA system I



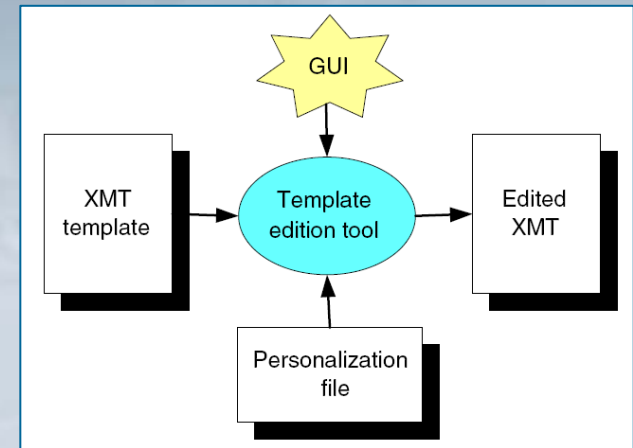
Overall process-level architecture of the MELISA system

MELISA system I

- Overall system architecture
 - Sender Side
 - content preparation: interactive advertisements, live bet offering, template design for enhanced content
 - management and packaging
 - Receiver side: a typically stand-alone machine that
- Authoring visual enhancements
 - Offline Authoring
 - takes place before the start of the sport event
 - creates an initial scene for the presentation
 - Online Authoring
 - generating and transmitting real-time encoded visual enhancements during the event

MELISA system II

- MPEG-4 BIFS
 - binary representation of audio-visual objects and behavior
 - represented by a tree
 - authored with the XMT Language
- Initial BIFS Scene
 - All static content (images of players, sponsors)
 - default parameters (not necessarily fully specified or displayed)
- BIFS Updates
 - BIFS-Anim Updates
 - BIFS-Commands Updates



Module for editing the XMT template

```
<perso target_url="football_stb.xmt">
<element path=
"/XMT-
A/Body/Replace/Scene/OrderedGroup/
chil-
dren/Switch[@DEF='N24']/choice/Transform2D/
children/Shape/geometry/Text[@string]"
label="name of football team 1"
type="string"
default="ATeam" />
</perso>
```

Example of personalization file

MELISA - Soccer game Scenario I

- Initial presentation scene

- Event
 - Betting, Info, Stats
- Score



Initial scene for football game on a STB

- Real time visual enhancements

- Customization Points
 - line for distance to goal



Example of real-time visual enhancement.

MELISA - Soccer game Scenario II

- Result of several generated real-time contents on the initial presentation
 - Bet Menu
 - Score
 - Time
 - Player Info



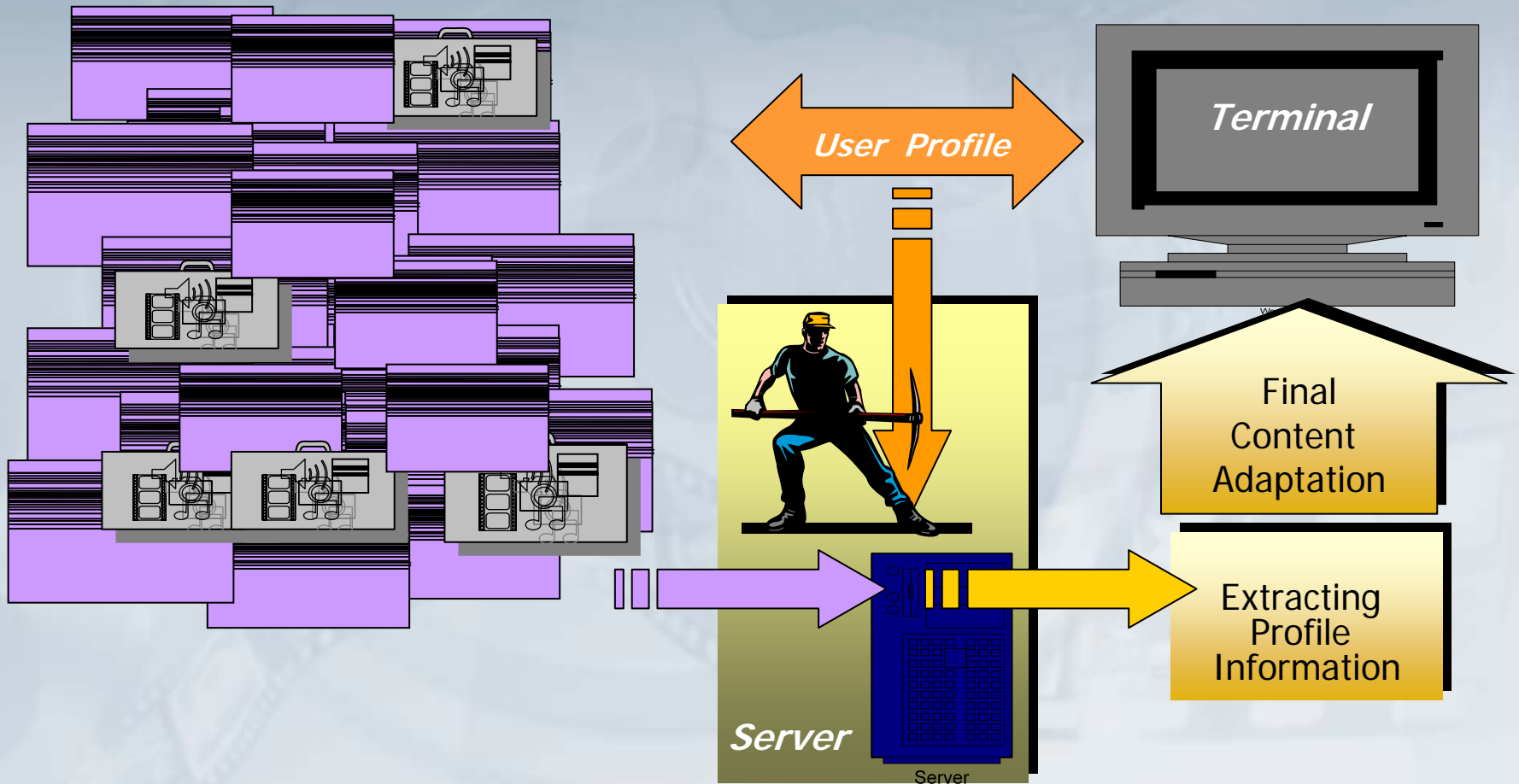
Fig.1



Fig.2

Content Adaptation & Personalized Interface

User Personalization System



Multimedia resource adaptation I

■ MELISA Digital Item

- all information packaged in one entity (MPEG 21 – DIDL)
- contains a version of the content for each supported platform
- adopts MPEG 21 – DIA,
 - messages between servers and users are in the form of XML documents with URL links to resources or encoded binary data.

■ DIA framework

- Usage Environment Description Tools: User Characteristics, Terminal Capabilities, Network Characteristics, Natural Environment Characteristics
- Digital Item Resource Adaptation Tools: Bitstream Syntax Description – BSD, Adaptation QoS, Metadata Adaptability

Multi-user Profiling I

- Content Adaptation based on End User preferences
 - Content filtering
 - Personalization
- User Profile Extraction
 - Usage History
- Profile Building
 - User interests
 - A/V enhancements
 - Interactivity motions
 - Event alerting functionalities

Multi-user Profiling II

- Personalized TV viewing
 - Choosing what to view and when
 - e.g. choice of a particular event or specific portions, e.g. the final 20mins
 - Choosing how to view the program
 - e.g. betting opportunities during a football match, show alerts when other programs of interest are available
 - adapt to aggregate group profiles
 - watching TV, especially sports and movies, tends to be a social activity

Multi-user Profiling III

- Cumulative User Profiling
 - Following of a TV viewing group
 - Least Misery Strategy
 - Aggregating the preferences of the persons that make up the group
 - Statistical Extracted Stereotypes
 - Each viewer may not be awarded their first option, but in most cases the system will choose an option close to their liking

Conclusions

- Heterogeneous multimedia consumption in the framework of digital TV under the scope of MPEG21 standard
 - MELISA system
 - Multimedia Resource Adaptation
 - Multi-user Profiling

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Questions

