Personal Content Management on PDA for Health Care Applications

http://mobmed.axmedis.org

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Outline

- Scenarios
- Mobile Medicine Content Examples
- Content Access and technical requirements
- Intelligent content
- AXMEDIIS format and model
- The architecture of Mobile Medicine
- PDA Organizer for content
- Mobile Medicine: Content production
- Conclusions
Scenarios of Mobile Medicine

- **intelligent solution** in the hands of doctors and assistants for:
  - **Continuous Medical Educations**, CME, during the doctor life and continuous update;
  - **Calculation** of dosages, status/conditions, risks,..
  - **Education**: medical University/School level;
  - **Emergency help** medical personnel to take decisions and remind procedures/protocols, etc.;
  - **Collect data** from patients that cannot be easily collected or that are too expensive to be collected with mobile instruments;
  - **EPR**: *Electronic Patient Record report, excerpts*

- Simple, usable and accessible OFF-LINE
Mobile Medicine: Content examples

- **Content Examples:**
  - **Educational:**
    - Sliding Shows, video, document, audio, images…
  - **Procedures/protocols:** (mini applications)
    - Emergency, routines, …
  - **Dosages** for intensive therapy: (mini applications)
    - Formulas, ranges, different application cases
  - **Calculators** for several aspects: (mini applications)
    - Risk analysis, …e.g.: pulmonary emboli….  
    - Classification of conditions/damages, …

- **Needs of customizing:**
  - user interface, behavior, accessibility rights, etc.
Mobile Medicine Content Access

- Collect content on their mobile device, PDA
- Access to personal collection in any conditions
- Navigate into the collection via several views:
  - medical, taxonomy, classif., description, etc.
  - Use data based: less used, most, recent, etc.
- Querying into the collection
- Keep updated the content collection automatically
- Keep the same content accessible on PC/PDA
- Licensing and rights controls to access and use (patient info and/or record)
Technical Content Requirements

- **have to be indexed** with all its metadata and semantic information into the local database
  - may arrive into the device via any channel and solution
  - has to be automatically updated into the device without the user intervention
  - may present links with other content elements
- **may change behavior** on the basis of
  - user preferences/profile, device capabilities, network capabilities, general context description, device status
- **may request to user to provide info**;
  - e.g.: collection of patient data, perform actions on a checklists, do annotations, to create a multimedia scrapbooks, to provide user generated content, etc
- **may communicate with some central server** some messages;
  - for example: to mark that a content segment has been completed, report obtained data, decision taken, or possibilities browsed, ..
Intelligent Content

- A number of **cross media content** formats: SCORM, MXF, NewsML, MPEG-21, Flash, HTML, etc.

- **Major Issues** for cross media content (DMS 2008):
  - Packaging: Metadata and descriptors + essences
  - Distribution: download, streaming, progressive, P2P,..
  - Hierarchical nesting levels: IPR, Metadata, etc.
  - Intelligence: profiling, decision, scripting
  - Tools: Players and Authoring tools
  - Automated production, repurposing, delivering
  - Protection: CAS vs DRM

...
Interactive and intelligent content

- Integrated media info
- Proactive with the users
- Attractive experience
- Personalized
- Multichannel interoperable
- Device interoperable

Final users

- Browse, search
- User generated
- Proactive
- Multichannel
- User generated
- Saving experience
Examples: Intelligent Content

- **Single Files:**
  - audio, video, documenti, images, etc..

- **Interactive Content:**
  - HTML or SMIL as technology of User interaction
  - Guides, games, etc.
  - Valoriz. of Cultural Heritage content
  - Educational Content

- **Proactive Wizard:**
  - Video messg. Recording, UGC
  - Assisted upload
  - Production of licenses
  - User profile processing
  - Taking decision
  - Local indexing/searching
  - Local assistant
  - ....
AXMEDIS/MPEG-21

- **Structure**: hierarchical, links, etc.
- **Distribution**: download, p2p, progressive, stream
- **Classification**: DC, taxonomy, any MD, descriptors
- **Identification**: any IDs, for DRM AXOID
- **Behavior**: change on the basis of context, descriptors, axmethod code
- **Processing**: axmethod as in the AXCP, plugins, ...
- **Presentational/interaction**: SMIL, MPEG-4, HTML, ...
  - Activation of methods, forms,
- **File format**: direct play without unpack of video, ...
- **DRM/prot** via MPEG-21 models and AXMEDIS implementation
- **Annotations**: possible
Mobile Medicine

Automated Back office

Complex content

-PC, MACos, linux, ...
iPhone, iPod, Windows Mobile, Android(*), ....

UGC, web page, comments

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Mobile Medicine

AXCP Quick Start, Your tools commands, Workflow systems,…

AXMEDIS AXCP GRID backoffice server: semantic computing
AXMEDIS DRM: for Rights control and security
Mobile Medicine portal for the multichannel distribution:
- PC, PDA, iPhone, iPod, mobile, etc.
Production tools and players, for PC and PDA

Internet, WEB, VOD, POD...
Mobiles, PDA, etc.

FTP, WS, etc.

AXCP GRID
AXCP Scheduler
AXCP Node
AXCP Node
AXCP Node

AXMEDIS DRM Server

Monitoring & Reporting

WEB Server for PC and Mobile, Content Upload

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Personal Mobile Social Intelligence

AxObjectFinder

HTML & CSS Based Presentation Engine

AxPDAPlayer

- Media Player
- PDF player
- ..... player

Download/update Manager
File Explorer
Local Browser
Search Engine
Taxonomy Browser
User Behavior Collection
Contextual Information

Content Indexer, semantic ingestion/processing

Local PDA files
SQLite DB

Local PDA files

Web
Local Search
Taxonomy

Local PDA files

Internet Explorer

Local PDA files

SQLite DB

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Semantic flows

- User Profile
- User behavior
- Use data
- Content
  - DC+IDs
  - AXInfo: ver, prod., rights, ...
  - Descriptors
  - Taxonomy
  - Groups
- Recommendation
- Suggestions on the basis of user behavior

- Local User Profile
- Local User behavior
- Local Use data
- Local Content
  - DC+IDs
  - AXInfo: ver, prod, rights, ....
  - Descriptors
  - Taxonomy
  - Groups
- Local Recommendation
- Local Suggestions on the basis of user behavior and local content

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Accessible since June 2009

Several objects and mini-applications,
- calculators for dosages, verification, etc.

Intelligent Content Organizer for PDA WM5/6
- Medical taxonomy allows to make navigation into content
- local recommendations
- Offline/online

iPhone supported via regular portal, only for online
Content Production

User: upload/propose Single file content directly

Automated backoffice: Transcode, adapt, ...

ADMIN, validate send in publication

User: study and design complex content, then upload

Produce the complex content with authoring tool

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Mobile Medicine AxObjectFinder

Suggestions on the basis of user behavior
Some references

- **Mobile Medicine**: [http://mobmed.axmedis.org](http://mobmed.axmedis.org)
  - Development and production tools
- **AXMEDIS**: [http://www.axmedis.org](http://www.axmedis.org)
  - Report and documentation, development tools and demos
- **DISIT Lab**, Univ. Firenze, DSI: [http://www.disit.dsi.unifi.it/](http://www.disit.dsi.unifi.it/)
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