Product Placement Platform for Personalised Advertising

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1. Context
1. CONTEXT

Personalised Product Placement
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Personalised Product Placement | Approach

- Viewers
  - Product Placement (II)
  - Feedback

- Distributors
  - Product Placement (I)
  - Profiling
  - Viewer Stream (Products)
  - Feedback

- Advertisers
  - Negotiated Products

- Brokerage & Negotiation Platform
  - Viewer Stream Profiles
  - SLA (Products)
  - Product Descriptions
  - SLA (Products)
2. Profiling
Dynamic Viewer Profiling

- Stream of viewer events | rated and watched programmes
- Model creation with Singular Value Decomposition | initial dataset
- Model update with stochastic gradient descent function

Implicit feedback positive model | viewer watched programmes

Explicit feedback model | viewer rated programmes
3. PLATFORM

Domain Knowledge

- Ads-Products
  - Id
  - Name
  - Contract
  - YP Profile
  - Price features
  - Timeslot
  - UNSPSC code

- YP Classified Ads
- UNSPSC

- Placeholders
  - Id
  - Name
  - BBC Profile
  - Price data
  - #frames

- Streams
  - Id
  - BBC Profile

- BBC Programmes Ontology Categories

- Advertisers
- Distributors
- Viewers
  - Id
  - Personal data
  - BBC Profile

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Layered MAS Architecture

Interface Layer: Interface Agents

Agreement Layer: SLA Agents

Enterprise Layer: Business Agents

Market Layer: Business Delegate Agents

Admin, Advert_1, Advert_A, Distr_1, Distr_D
Service Level Agreements (SLA)

- **bSLA**: brokerage SLA | advertiser/distributor business & platform
- **cSLA**: coalition SLA | between providers (advertisers)
- **rSLA**: resource SLA | between provider (advertisers) & distributor
Pay-per-use Business Model

- Established SLA remain latent till the service is provided
- Playout of a product placement involves (at least) three payments:
  - distributor pays the provider the resource price
  - provider pays the platform the accorded brokerage fee
  - distributor pays the platform the negotiated brokerage fee
- SLA violation results in the reimbursement of the accorded price/fee
3. PLATFORM

SLA Life Cycle

Service Provision

Service Provision Renegotiation

Temp  Inst  Nego  Enfo  Term

Success  Success  Failure  Failure

Pena
2. PLATFORM

**Interface Layer**

- **Advertiser GUI**
- **Distributor GUI**
- **Admin GUI**

**Workflow in BPMN**

- \[\langle \text{Ad}, \ldots \rangle, \ldots \rangle\]
- \[\langle \text{Ad}, \text{Timeslot}, \text{Price} \rangle, \ldots \rangle\]
- \[\langle \text{Viewer, Stream, Placeholder} \rangle, \ldots \rangle\]

**Workflow in BPMN**

- \[\langle \text{Viewer, Stream, Timeslot, Price} \rangle, \ldots \rangle\]

**UDDI Service Registry**

**WS Interface**

- **Advertiser Interface** $\text{Ag}_1$
- **Advertiser Interface** $\text{Ag}_n$
- **Interface Layer** $\text{Ag}$
- **Distributor Interface** $\text{Ag}_1$
- **Distributor Interface** $\text{Ag}_m$

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New European Media

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Enterprise Layer | Trust-based Invitation/Acceptance

**Distributor**
- Identifies personalisation opportunities *(upcoming placeholders)*
- Determines the placeholder profile *(viewer and stream profiles)*
- Looks up at the UDDI and invites producers *(holding ads on products matching the placeholder profile)* for negotiation
- Launches a delegate agent to negotiate the product placement

**Provider**
- Accepts/rejects the invitation
- Selects the ad with highest similarity *(with the placeholder profile)*
- Launches a delegate agent *(market layer)* to negotiate the selected product
Negotiation Protocols:

- Bargaining | bSLA
- FIPA ICNET | cSLA & rSLA

Dimensions:

- Price/s
- Interval profile vs ad (product) similarity
- Number of matching categories between placeholder and ad
4. Conclusions
Conclusions

The platform supports personalised product placement

Businesses

- register at the platform
- upload the workflow of their agents using BPMN
- upload viewer, stream or ad data
- download the established rSLA

Brokerage & negotiation services

- partner lookup, trust-based invitation/acceptance
- trust-based bSLA, cSLA and rSLA negotiation
- rSLA (product placement) multidimensional negotiation
4. CONCLUSIONS

Future Challenges

Product creation & description | producers

Product composition and rendering | viewer platform
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