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# Second Screen and Rich Content: Requirements and Approaches for Content-based Recommendations and Linking

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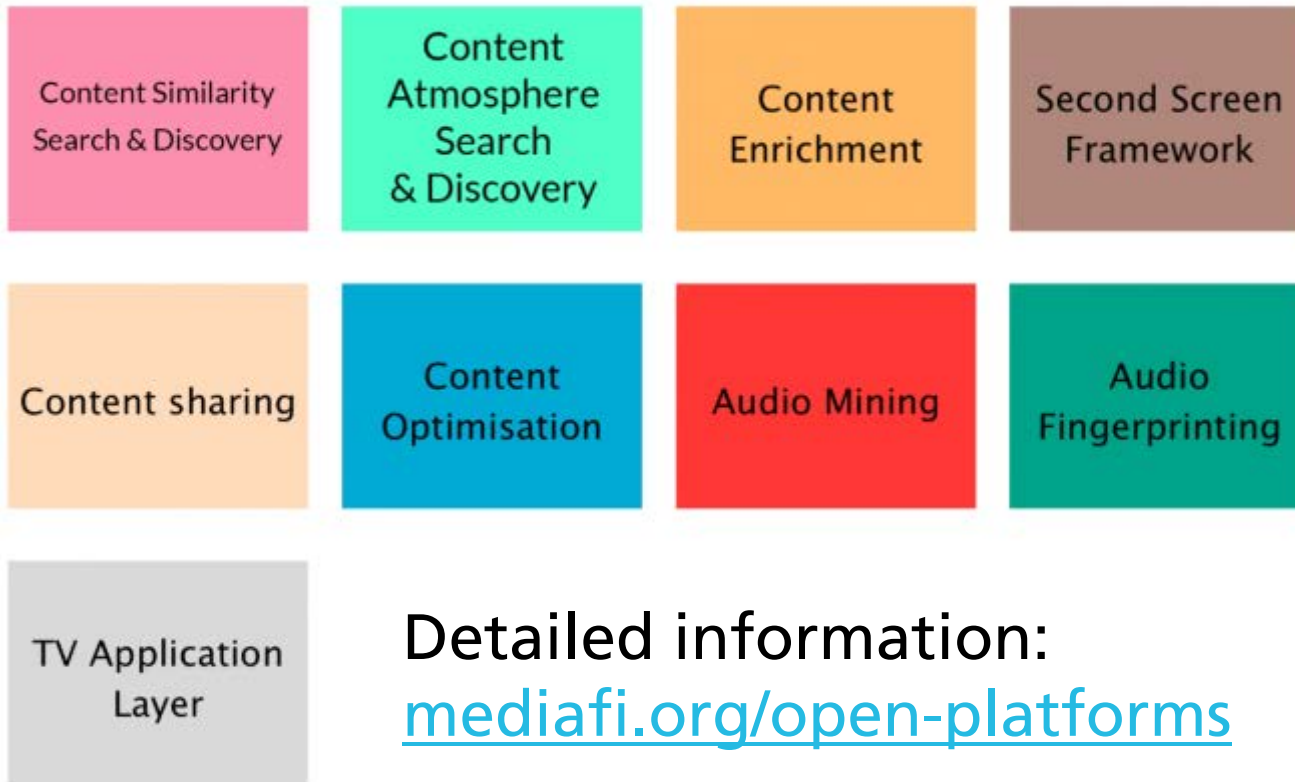
Dr. Michael Eble | TV-RING Workshop „An outlook on future HbbTV-Services“ | May 7<sup>th</sup> 2014 | Berlin

# Agenda

1. Context: Social connected TV and Content Technologies
2. Use Case Scenarios: „Multi-Screen“ and „Rich Content“
3. Requirements for Content Technologies
4. Approaches and conclusion

# CONTEXT: PROJECTS IN THE MEDIA DOMAIN

# FIcontent: Specific Enablers for Social connected TV by consortia partners



# Application: ARD WebDuell

## Use Case

- Compare statements made by politicians to prepare your vote
- Search for spoken content in over 30 TV formats produced by ARD broadcasters

## Approach

- Automatic structural analysis
- Manual speaker labelling
- Automatic speech recognition



# Application: „Galileo Videolexikon“ for mobile devices

## Use Case Scenario

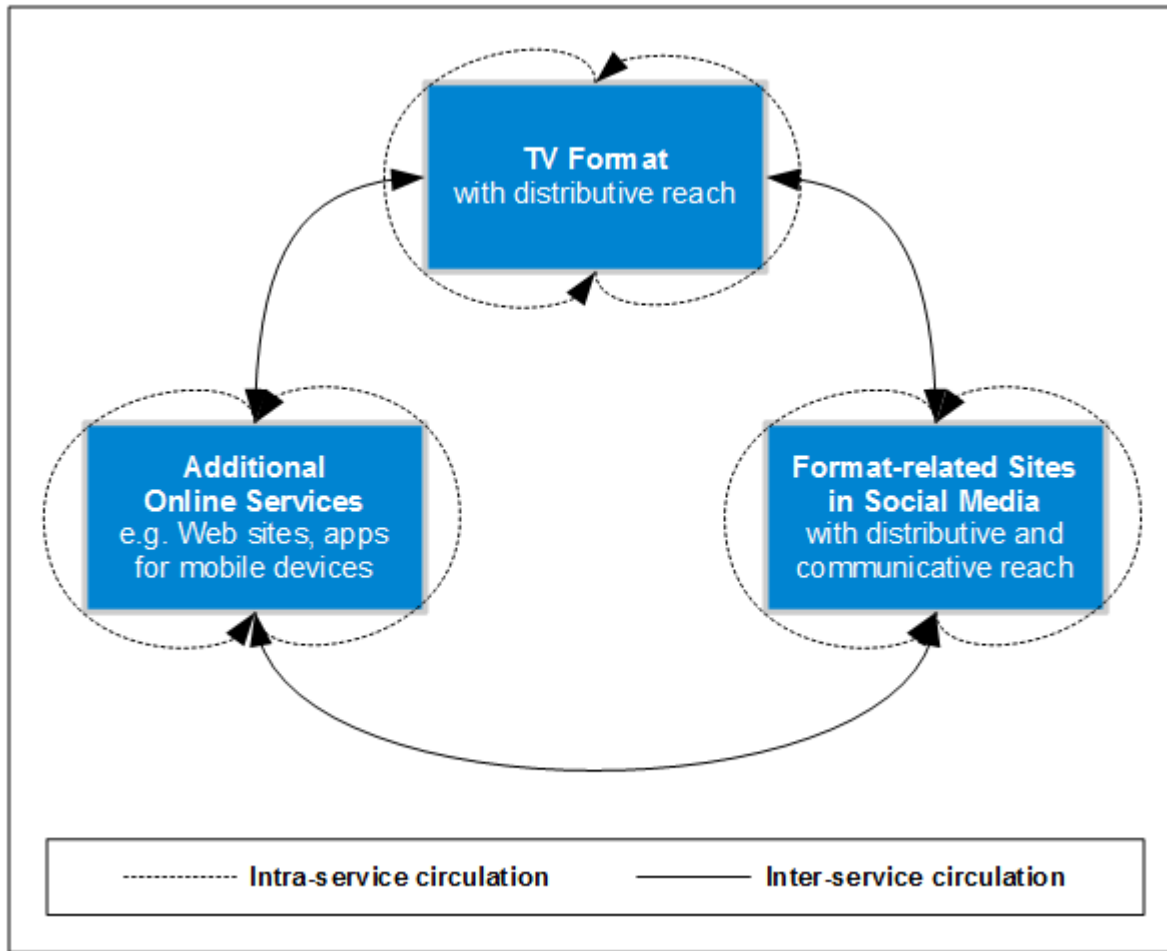
- Multimedia Encyclopaedia for Second Screen usage
- Enable users to access video content via full-text search

## Approach

- Speaker recognition
- Speech recognition
- Keyword extraction

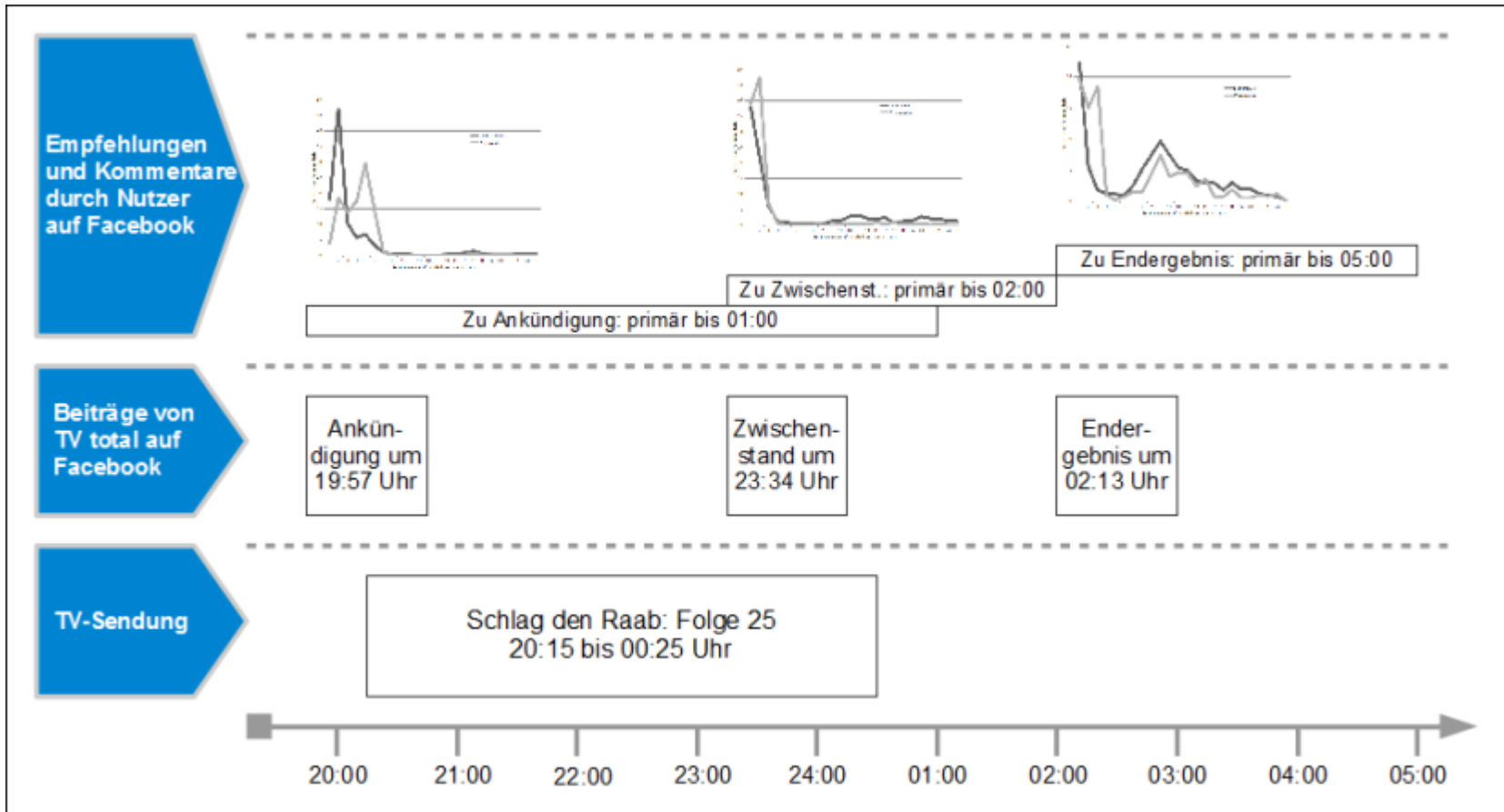


# Context: Audience circulation and retention time



Quelle: Eble 2013a (translated to English)

# Example: „Schlag den Raab“ (ProSieben)



Quelle: Eble 2013a

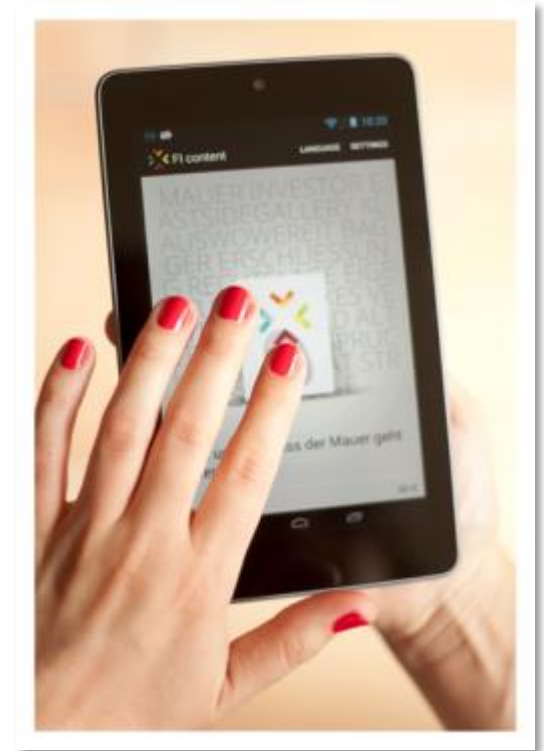


# USE CASE SCENARIOS

# FIcontent Use Case Scenario: „Multi-Screen Experience“



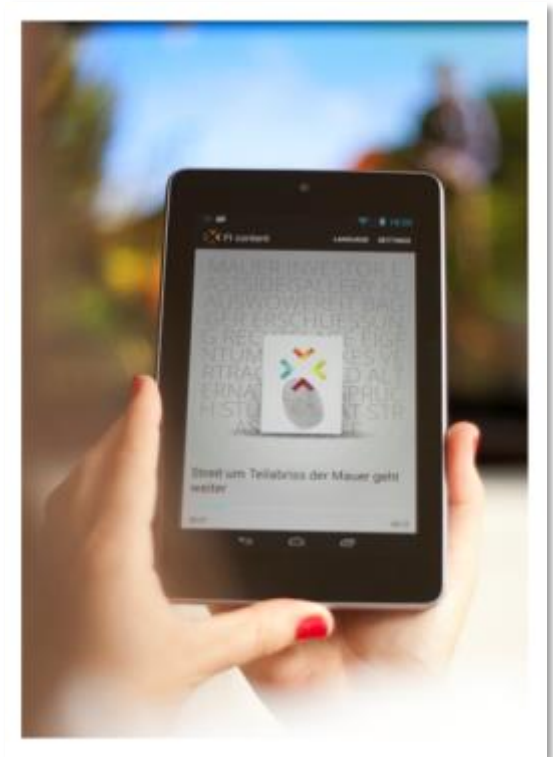
- TV-content-accompanying second-screen applications
- **Automatically sync** with the TV content based on user's wish to couple devices
- Start **companion applications** on a coupled second screen
- Provide viewers with **additional information that fits the context**



# FIcontent Use Case Scenario: „Rich Content“



- While watching the main video on the large TV screen the user may choose to **use a tablet to consume additional information or enrich the video.**
- Video content can be enriched by the content providers or by end-users.
- Enrichment covers annotations, **linking other content** such as video, audio, text, etc.



# REQUIREMENTS FOR CONTENT-TECHNOLOGIES

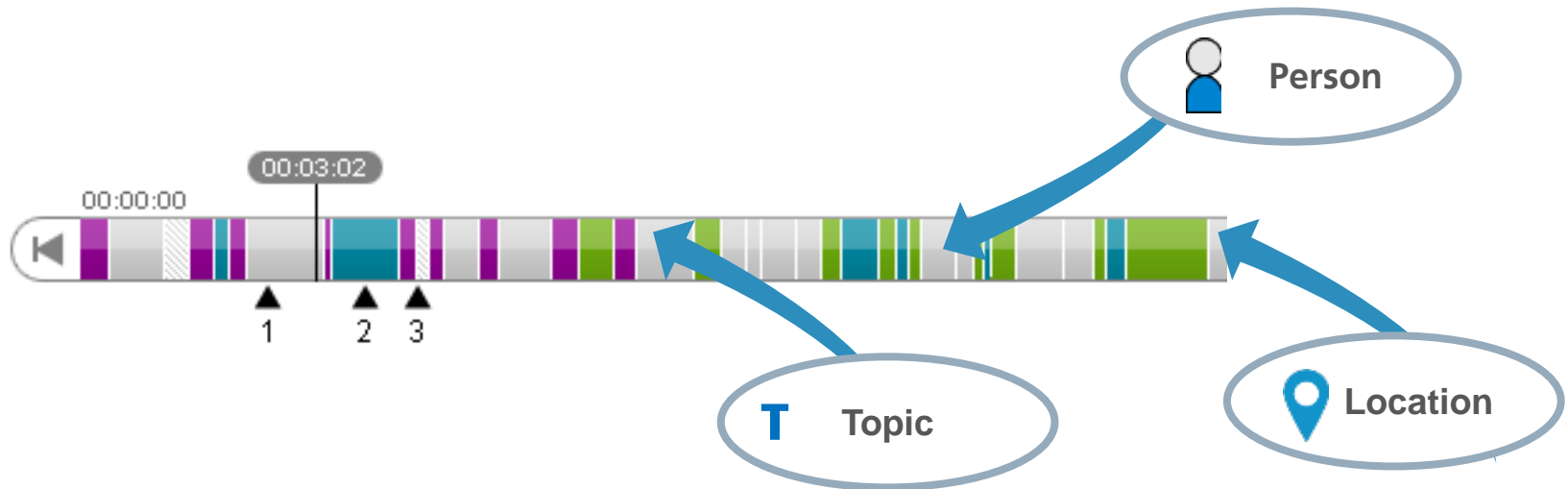
# A selection of requirements

Req. ID	Short description of requirement
R-SeSc-03	Ensure a <b>constant and robust content-based synchronisation</b> between First and Second Screen for the <b>various types of TV broadcasting and Internet-based VoD</b> .
R-RC-04	Enable content producers and editors to <b>revise transcript, meta and linked data</b> that has been generated automatically, so that they can ensure the quality of the content to be published.
R-SCTV-04	Enable developers to use content technologies for integration into their own applications (e.g. CMS, Apps) via <b>documented APIs</b> .
R-RC-05	Enable automatic <b>recommendations for additional media assets which are based on the spoken content</b> of the respective given media asset and not solely on its descriptive meta data.
R-RC-07	Enable multimedia indexing and linking of various data sources (archive and stream) for <b>(near) real-time analysis and usage of Big Data</b> in newsrooms.

# Requirement: Enable revision of automatically generated data

- Editors want to be able **edit the output produced by automatic indexing and linking** within applications for content management and production.
- Multimedia Indexing: Editors want to **revise text transcripts and meta data** that has been generated by Audio Mining technology (automatic speech recognition).
- Multimedia Linking: Editors want to **revise results from Named Entity Recognition and Linking** in order to ensure that links to DBPedia, Wikipedia or other pages are adequate.

# Workflow: Multimedia Indexing and Linking



# Requirement: Enable (near) real-time analysis of multimedia content

## Challenges in newsrooms

- Heterogeneous und unstructured data streams in newsrooms
- Events happening simultaneously on various platforms
- Limited capacity for manual information processing

## Needs and requirements

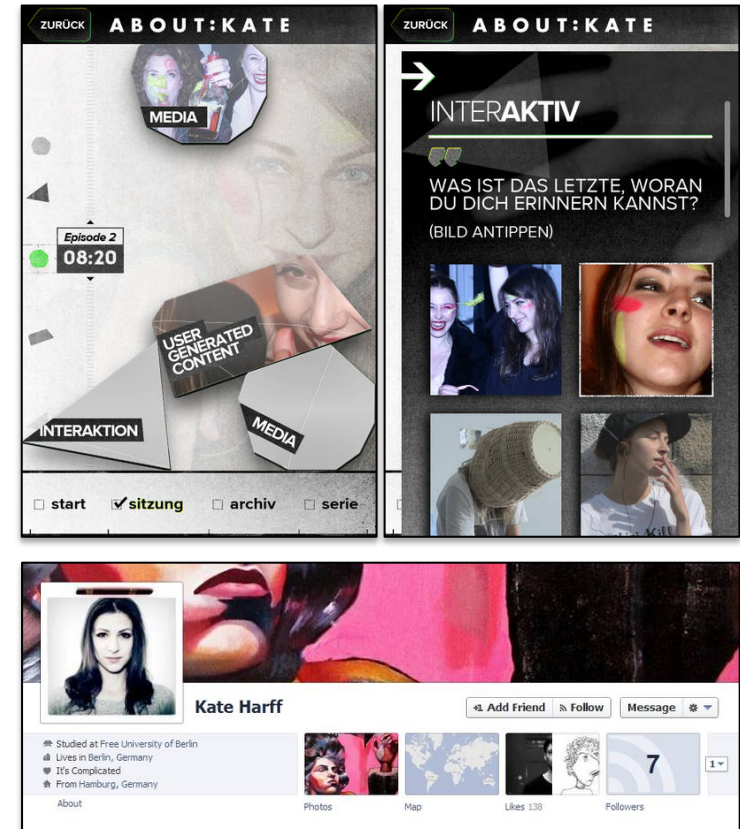
- Tools for aggregating distributed multimedia data
- Indexing and linking unstructured news streams
- Combination of manual and automatic analysis



# APPROACHES AND CONCLUSION

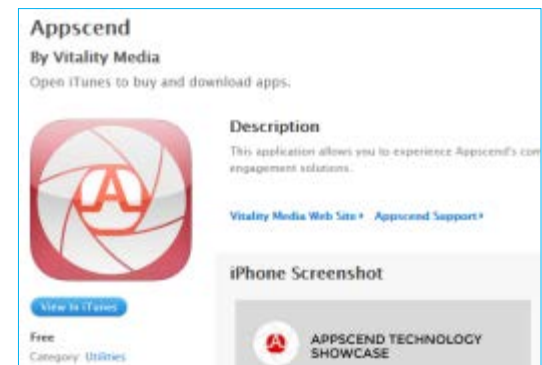
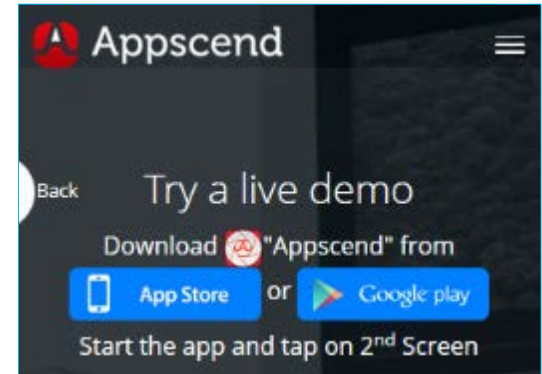
# About:Kate: Native Second Screen format

- Trans-media Storytelling for a fictional TV series
- Synchronisation between TV / VoD and App on mobile devices
- Constant synchronisation based on Audio Fingerprinting
- Native apps for iOS and Android providing rich content



# Appscend: Multi-Screen usage and interaction

- **Interactive applications** for TV sport events, music shows etc. on mobile devices
- Functionalities: Voting, casual games, quizzes, **background information** about actors etc.
- **Synchronisation** between First and Second Screen devices based on Audio Fingerprinting



# Conclusion on requirements and approaches

- **Multi-Screen Experience and Synchronisation:** Appropriate mechanisms and additional content differ with respect to use case scenarios and audiences
- **Digital Value Chains in Media Organisations:** Combination of automatic and manual approaches to multimedia indexing and linking for high-quality rich content
- **Multimedia Analytics for Big Data:** Need for handling the ever increasing amount of multimedia data from various sources in daily newsroom routines

# THANK YOU!

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