



STI · INNSBRUCK

On Using Semantically-Aware Rules for Efficient Online Communication

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The 8th International Web Rule Symposium

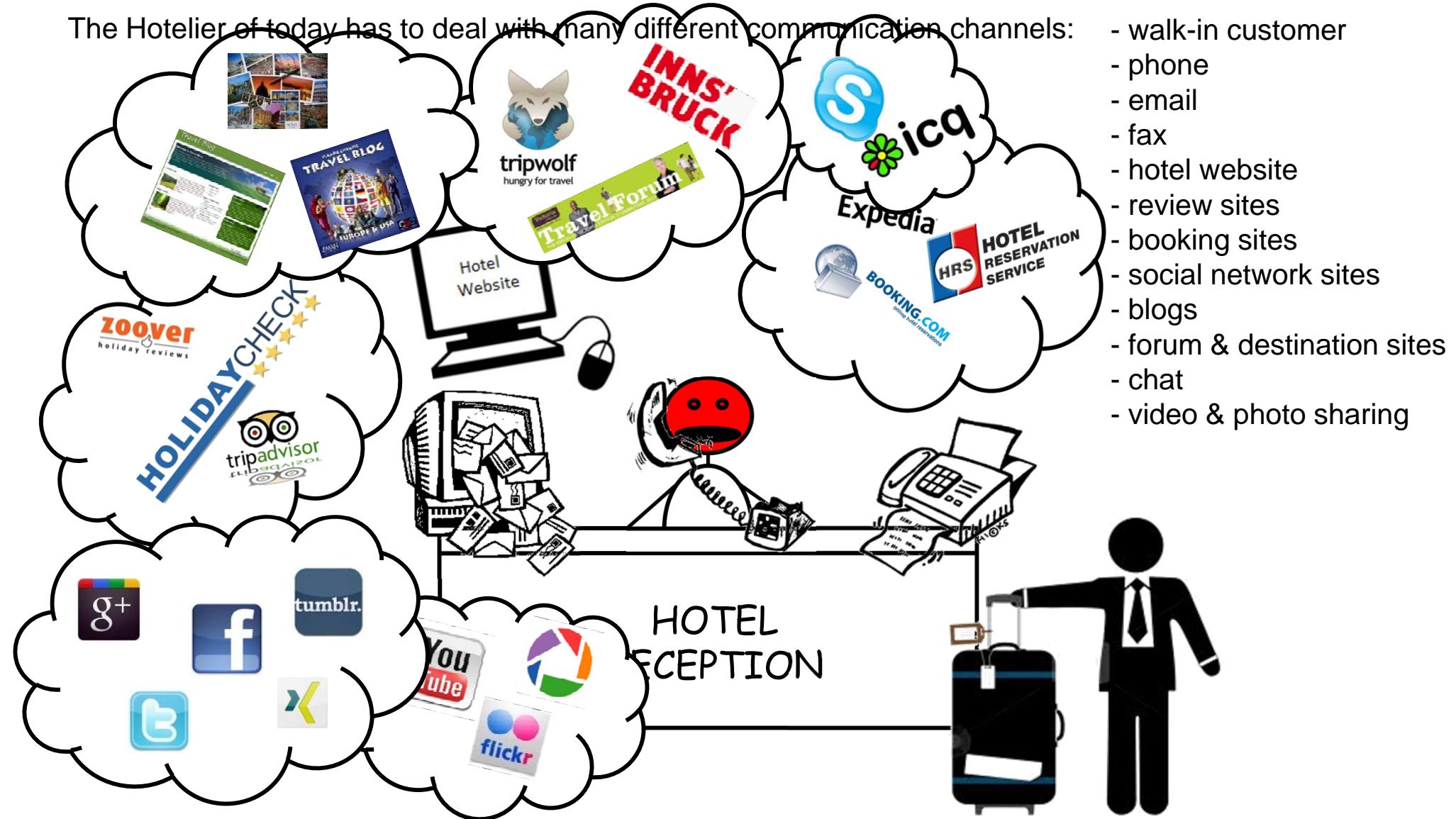
Prague, Czech Republic, August 18-20, 2014



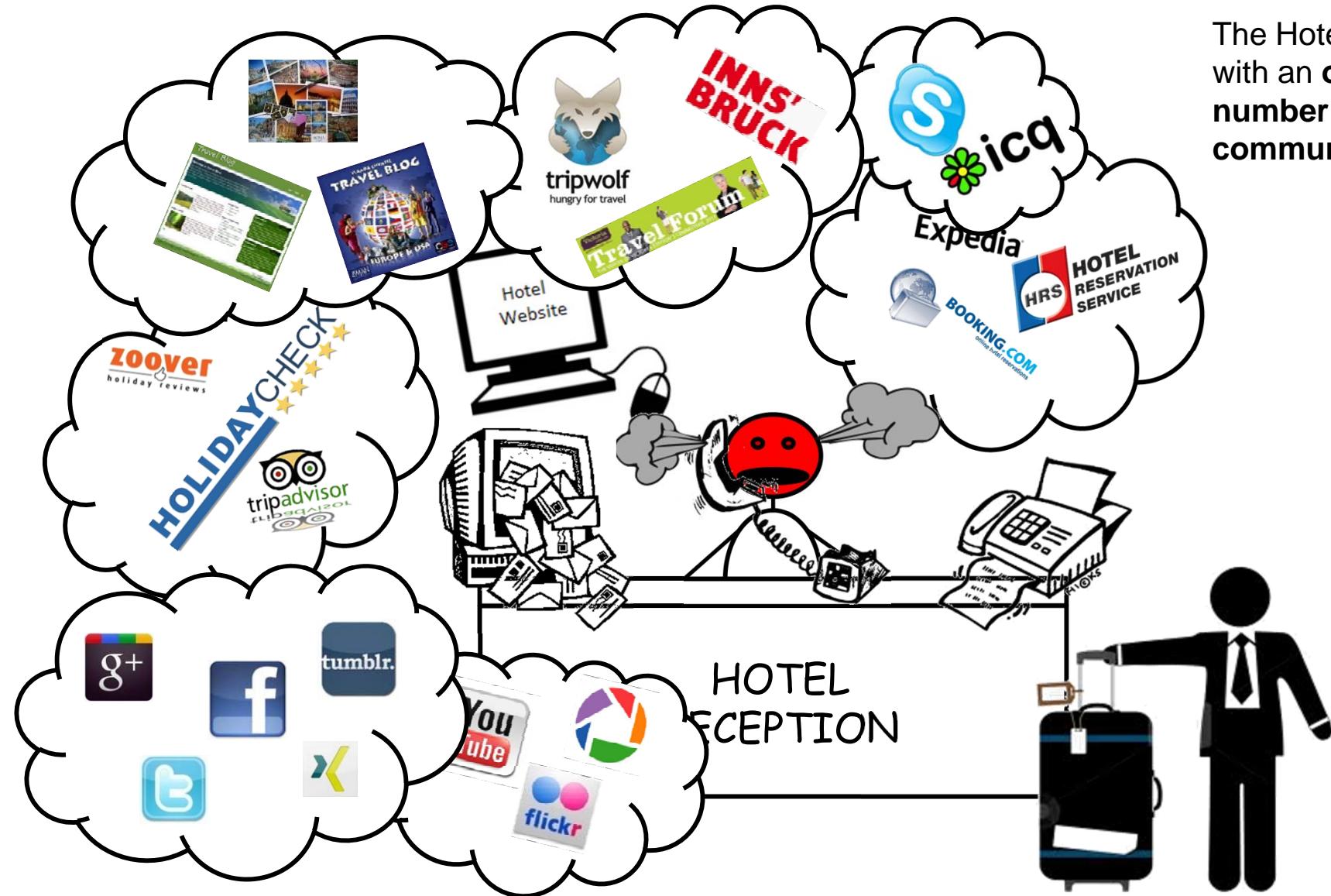
- Motivation
 - Communication Challenges
- Conceptual Approach
- Publication Rules
 - Rule Construction
- Use Cases: PlanetData, TVb Innsbruck
- Implementation
 - Evaluation
- Conclusions and Future Work

Motivation

The Hotelier of today has to deal with many different communication channels:



Motivation



The Hotelier has to deal with an **overwhelming number of communication channels**

Scalable Multi Channel Communication:

- Reach the greatest possible target audience with the smallest possible effort
- Reduce the amount of work required for filling out and observing the various communication channels
- Enable more precise targeting and optimized product positioning

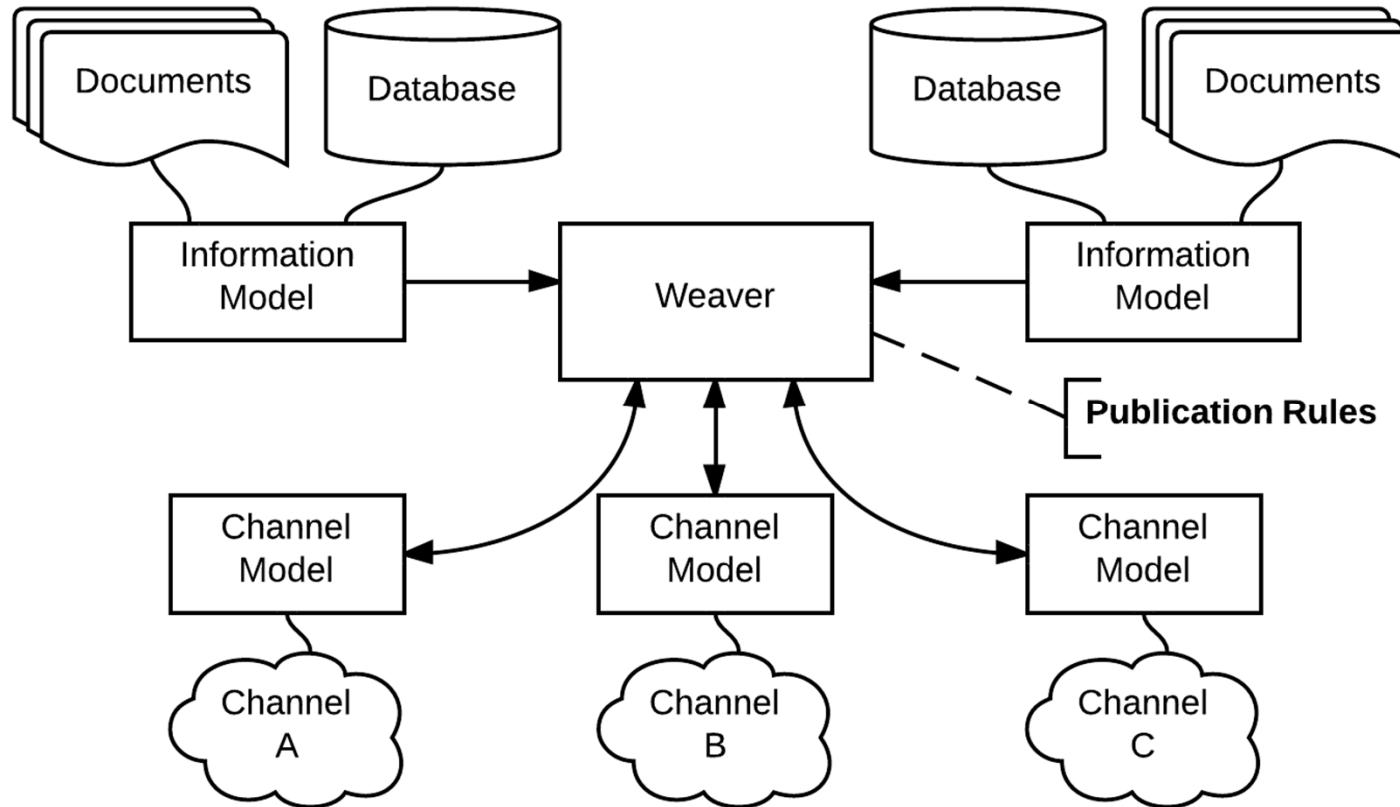
Our Solution:

1. Separate content from channels
2. Defining models for content and channels
3. Then, interlinking content and channels models with an intermediary component

Contributions:

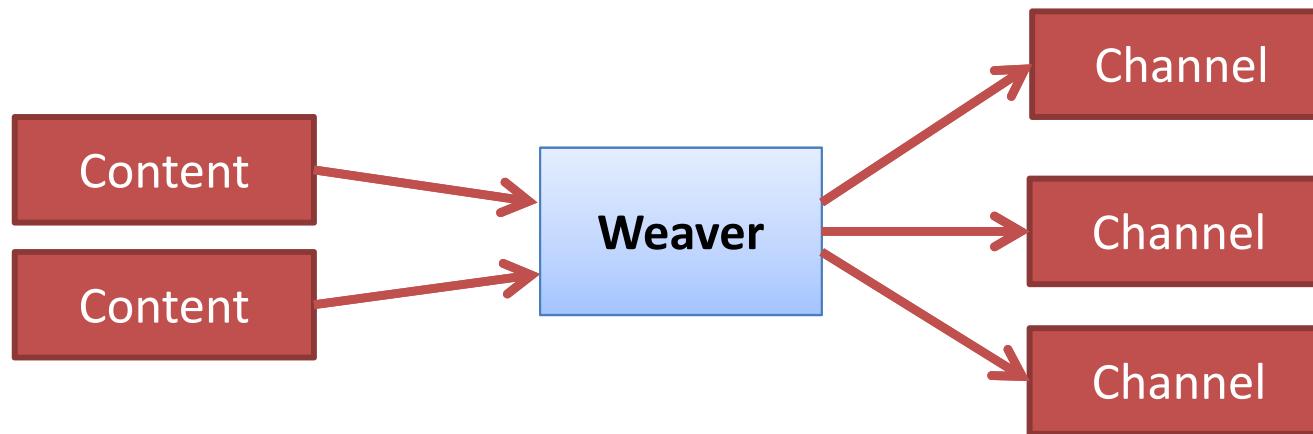
1. To have various dimensions of reusing the content and channels
2. To have flexibility for content adaptations to channels specificity

Conceptual Approach



- **Information Model** → describes the information items
- **Channel Model** → describes channel
- **Weaver** → aligning the information and channel models

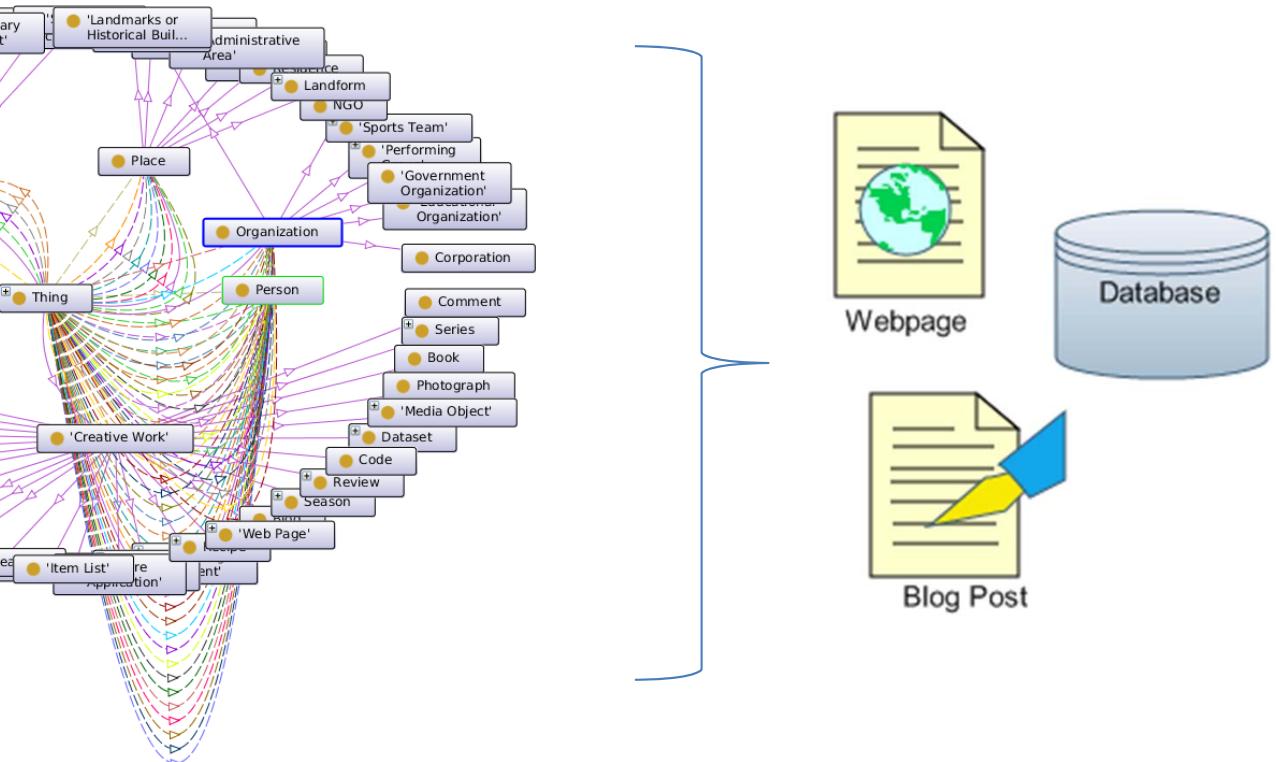
- Weaver → govern how the information and channel models are fit together



- Using a Rule-based System

Information Model

- An ontology that describes the information items that are used in typical acts of communication in a certain domain
 - Relevant concepts for information dissemination are determined and shared among the content sources



Channel

- A means of exchanging information through the online space
- Can be referred to (but not necessarily) with an URI

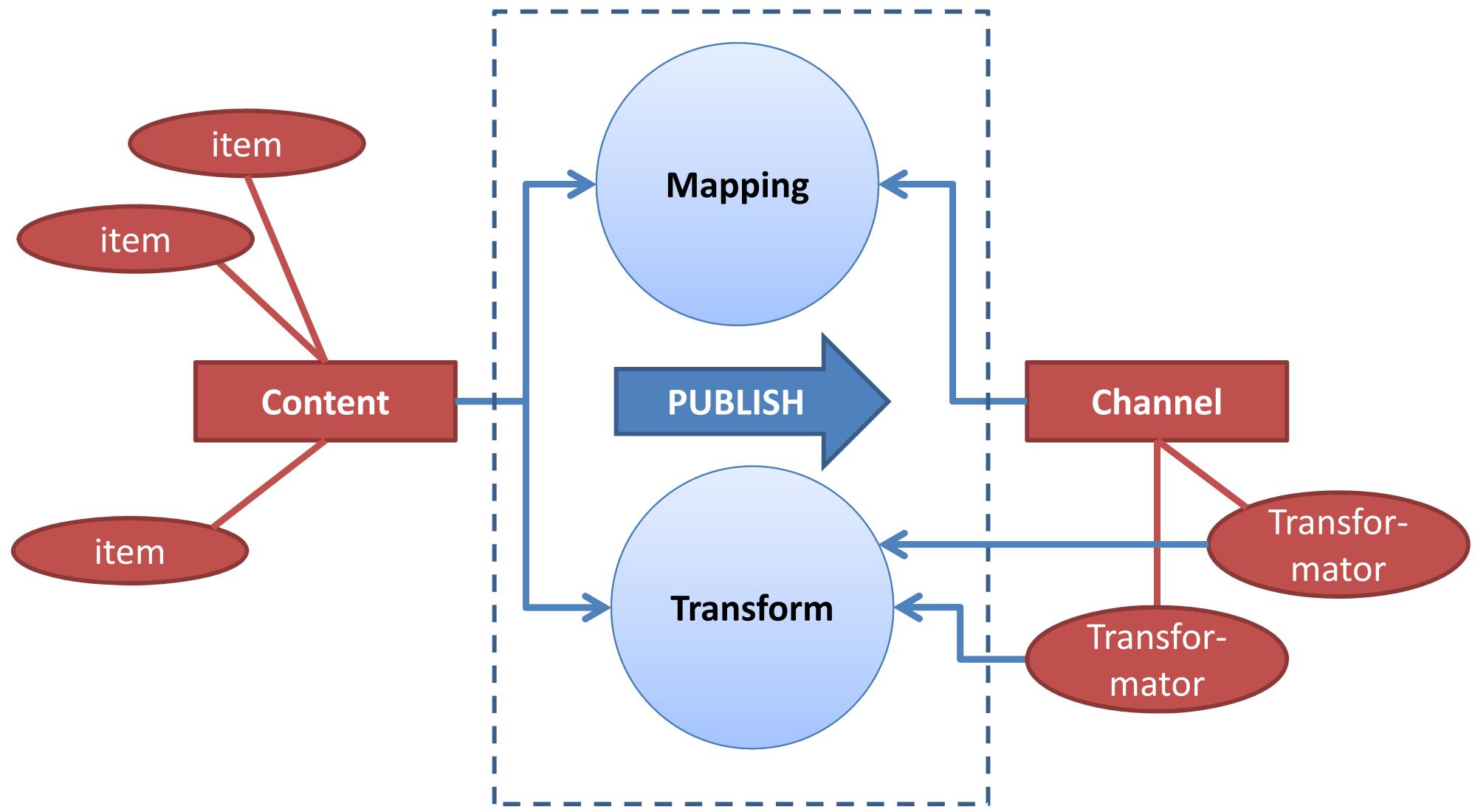
Each channel may have its own particularities

- Which types of information items can be read from or written to
- Access methods

Operator

- Content transformator → make sure all particularities are fulfilled

Rule Construction



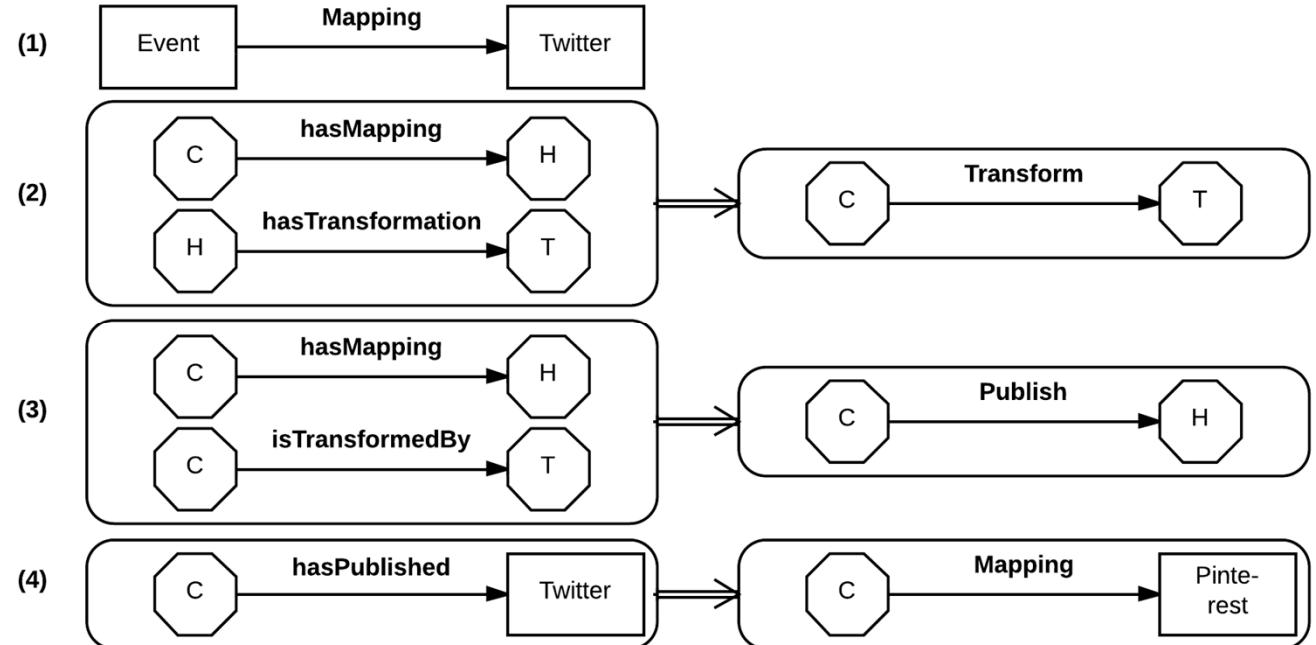
A Basic Publication Rule:

- Conditions:
 - a mapping of a content to a channel
 - an application of content transformators to the content
- Actions:
 - a publication of transformed content to the mapped channel

Example:

- Mapping an *Event* to *Twitter*
- Twitter supports a content transformator {*Selector*, *Trimmer*} → applying {*Selector*, *Trimmer*} to *Event*
- Publish the transformed *Event* to *Twitter*

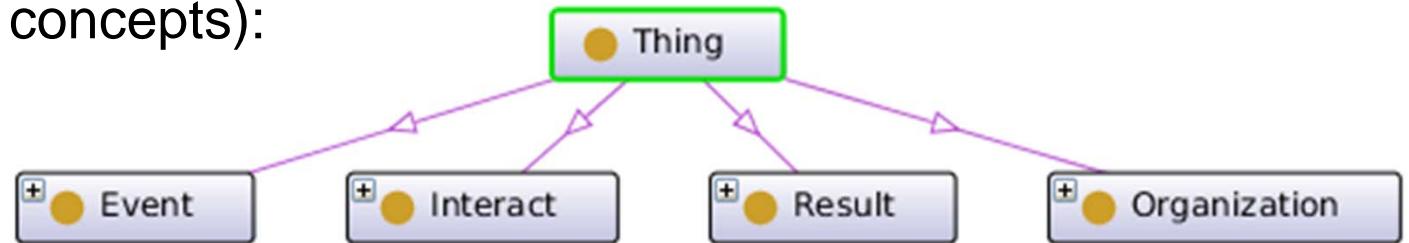
- Actions:
 - Mapping
 - Transform
 - Publish
- Facts:
 - hasTransformation
 - hasMapping
 - isTransformedBy
 - hasPublished



Example: publish an *Event* to *Twitter* and *Pinterest*

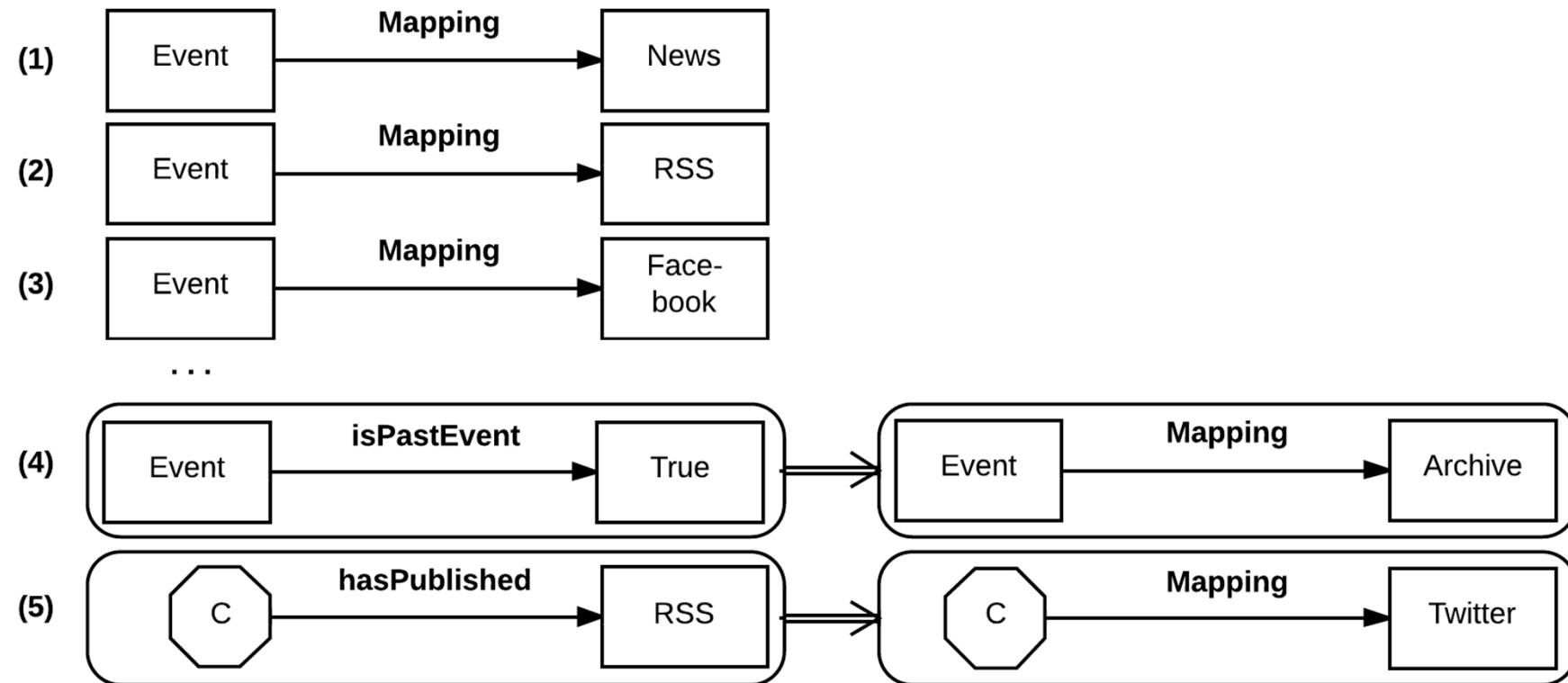
- (1) → a mapping
- (2-3) → transformation and publication
- (4) → a publication workflow
 - a coordinated publication where a publication P_1 will be performed only after a publication P_0 has been successfully executed)

- Mission: supports organizations in exposing their data in new and useful ways
- As part of dissemination tasks:
 - We had to take the content, adapter and publish it on each platform
 - Aim is to reduce the complex task on publishing on multiple platforms content related to the organization/project
- Content (top-level concepts):

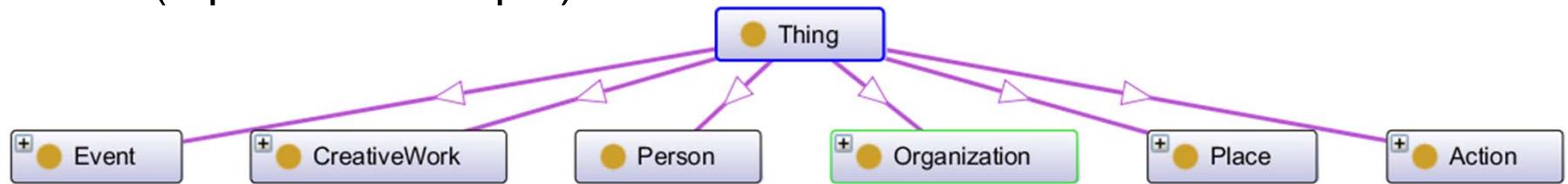


- Channels:
 1. Website (<http://planet-data.eu>)
 2. Facebook (<http://www.facebook.com/pages/Planet-Data/124932387564593>)
 3. Twitter (http://twitter.com/PlanetData_NoE)
 4. Wiki (<http://wiki.planet-date.eu>)
 5. SlideShare (http://www.slideshare.net/STI_PlanetData)
 6. VideoLectures (<http://videolectures.net/planetdata/>)

Use Cases: PlanetData

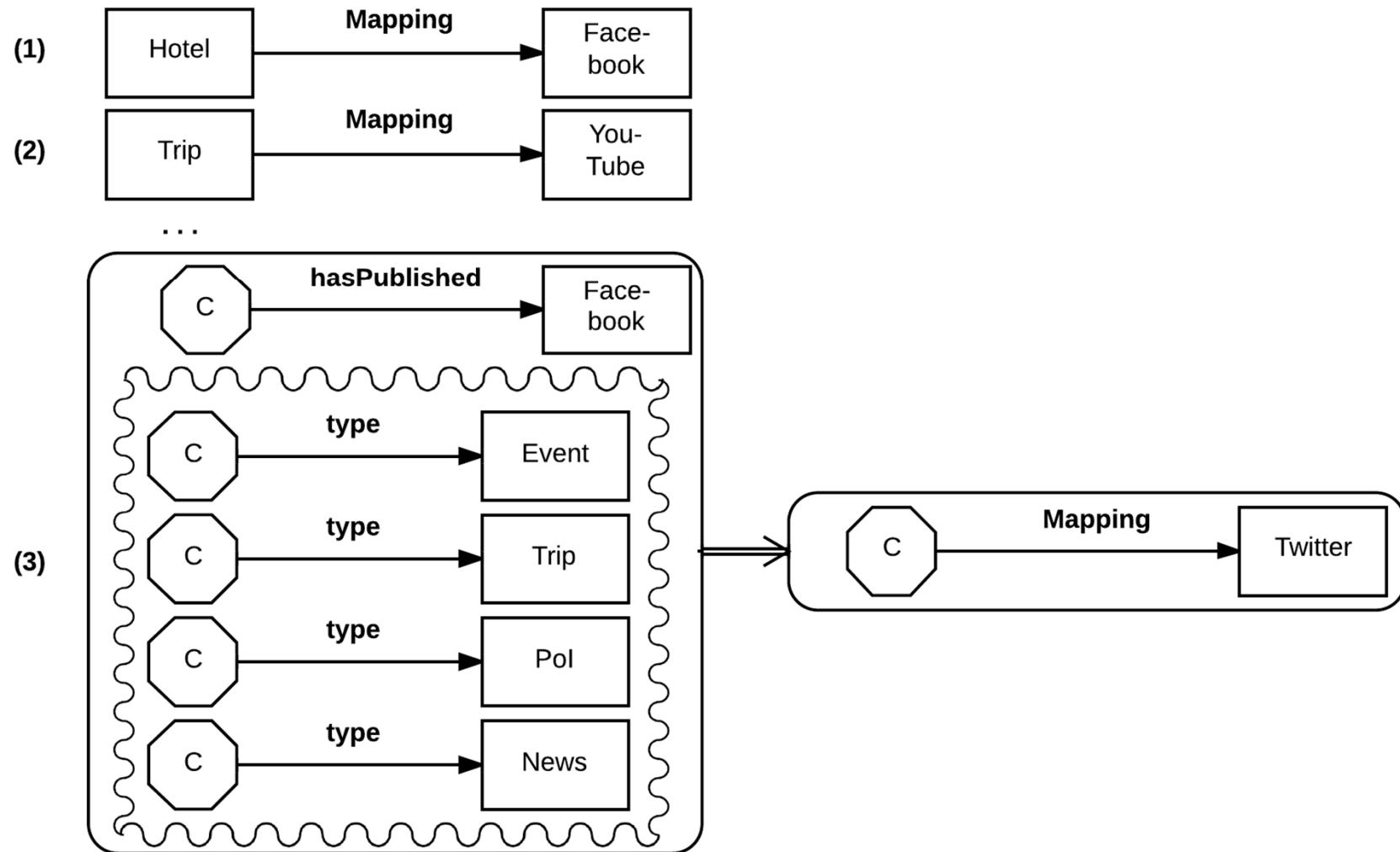


- Tourismusverband (TVb) Innsbruck
 - Highest possible visibility in search engines, present in various communication channels
- Content (top-level concepts):

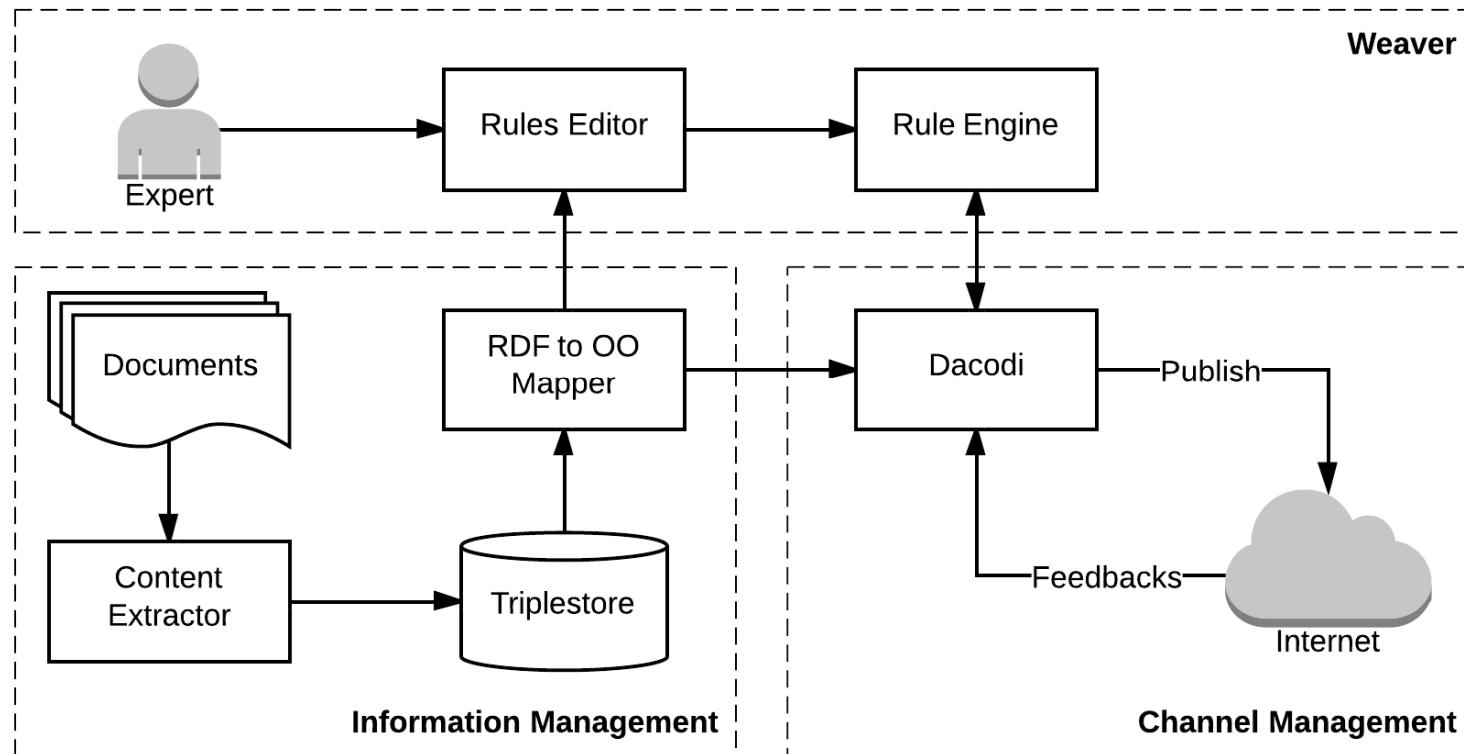


- Channels:
 1. Website (<http://www.innsbruck.info/>)
 2. Facebook (<https://www.facebook.com/Innsbruck>)
 3. Twitter (<https://twitter.com/InnsbruckTVB>)
 4. YouTube (<http://www.youtube.com/user/InnsbruckTVB>)
 5. Blog (<http://blog.innsbruck.info/>)
 6. Google+ (<http://plus.google.com/105781260453057880736/>)
 7. Instagram (<http://instagram.com/innsbrucktourism>)
 8. Pinterest (<http://www.pinterest.com/innsbrucktvb>)

Use Cases: TVb Innsbruck



Implementation



- **Information model:**
 - Vocabularies: Dublin Core, Friend of a Friend, Good Relations, Schema.org
 - Documents: Annotated and un-annotated sources
- **Dacodi:**
 - Distributing the content to channels, collecting and analyzing feedbacks
- **Weaver:**
 - Drools / Guvnor

Implementation

the Weaver Publish Rule editor

Browse Knowledge Bases Create New ▶ Packages PlanetData Global Area

Find PlanetData

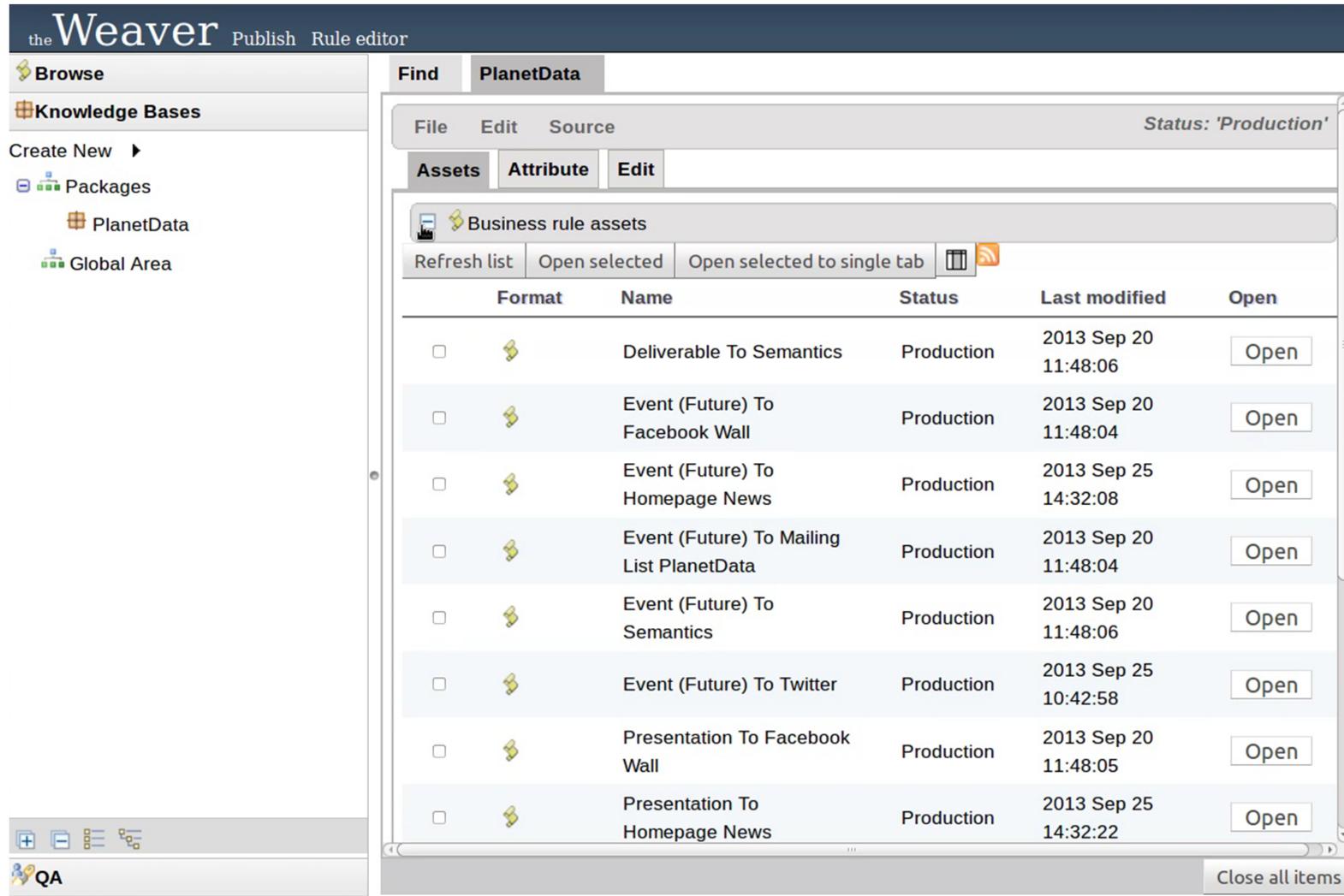
File Edit Source Status: 'Production'

Assets Attribute Edit

Business rule assets

Format	Name	Status	Last modified	Open
<input type="checkbox"/>	Deliverable To Semantics	Production	2013 Sep 20 11:48:06	<button>Open</button>
<input type="checkbox"/>	Event (Future) To Facebook Wall	Production	2013 Sep 20 11:48:04	<button>Open</button>
<input type="checkbox"/>	Event (Future) To Homepage News	Production	2013 Sep 25 14:32:08	<button>Open</button>
<input type="checkbox"/>	Event (Future) To Mailing List PlanetData	Production	2013 Sep 20 11:48:04	<button>Open</button>
<input type="checkbox"/>	Event (Future) To Semantics	Production	2013 Sep 20 11:48:06	<button>Open</button>
<input type="checkbox"/>	Event (Future) To Twitter	Production	2013 Sep 25 10:42:58	<button>Open</button>
<input type="checkbox"/>	Presentation To Facebook Wall	Production	2013 Sep 20 11:48:05	<button>Open</button>
<input type="checkbox"/>	Presentation To Homepage News	Production	2013 Sep 25 14:32:22	<button>Open</button>

QA Close all items



Implementation

the Weaver Publish Rule editor

Events Results

My published items (2):

Publication	Algebraic Structures for Capturing the Provenance of SPARQL Queries
Event	Linked Data on the Web (LDOW2013)

Available items

Choose an item category ▾

- European Data Forum 2014 (EDF2014)
- Linked Data on the Web (LDOW2013) ⓘ
- International Workshop on Semantic Sensor Networks
- European Data Forum 2013 (EDF2013)
- 10th ESWC 2013
- Third ESWC Summer School, Crete, September 2013
- 6th Extremely Large Databases Conference, Workshop & Tutorials (XLDB)
- 38th International Conference on Very Large Databases (VLDB)
- The 10th Semantic Web Challenge
- 1st International Workshop on Ontology Engineering in a Data-driven World (OEDW 2012)
- Big Linked Data Tutorial at Semantic Days 2012

[More items](#)

Reload package PlanetData from Guvnor.

[Reload rules.](#)

The **Weaver** is a content dissemination tool delivering content to channels. In the current implementation the Weaver can be used to disseminate content created within the frame of the [PlanetData](#) project. For more information on how to do this please refer to the [handbook](#).

[Publish \(filter\)](#) Publish

the Weaver [Publish](#) [Rule editor](#)

You have published to the following channels:

[Homepage News](#) (Success)
[Facebook \(Wall\)](#) (Success)
[Semantics](#) (Success)
[Homepage Archive](#) (Success)
[Homepage \(List of events\)](#) (Success)
Mailinglist [weaver-test@lists.sti2.at]
(Success)
[RSS](#) (Success)
[Twitter](#) (Success)

Total rules fired: 5

Implementation

the Weaver

[Publish](#) [Rule editor](#)

You have published to the following channels:

[Homepage News](#) (Success)

[Facebook \(Wall\)](#) (Success)

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[Homepage \(List of events\)](#) (Success)

st [weaver-test@lists]

(Success)

[RSS](#) (Success)

[Twitter](#) (Success)

Total rules fired: 5

Was war heute los?

STI Weaver - Test

vor 31 Sekunden

Event announcement: European Data Forum 2014 (EDF2014).
Please see: <http://websitetest.sti2.at/events/european-data-forum-2014-edf2014>

Gefällt mir · Kommentieren · Teilen

Tweets

Weaver @WeaverOnRules

PD event: websitetest.sti2.at/events/europea...

[Expand](#)

54s

Weaver @WeaverOnRules

Publication: websitetest.sti2.at/publications/v...

[Expand](#)

1h

Weaver @WeaverOnRules

Presentation: goo.gl/2FkbmS

[Expand](#)

8 Oct

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(1) Enrich content sources (website, blog) with selected vocabularies

- TVb → the increase of visitors without annotations was ~16% and with annotations is ~25% → may be caused by annotating the content



(2) Use the tool:

- PlanetData → webmaster using it for multi-channel dissemination
- TVb → there are now about 6 people testing it
 - Substituted the existing multi-channel dissemination tools (HootSuite) → has capability to obtain content from various sources (website, blog)

- Publication rules is a kind of reactive rules, reacting to changes in the information models
- Publication rules align semantically represented information models to channel models in numerous ways
- Publication rules enable scalable multi-channel communication
 - the information models are independent of any input channels

Future Work:

- The information is becoming more specific and targeted to a specific audience
 - Extend the publication rules to reflect those specificities → enabling the definition of specific transformation for a certain channel, i.e. campaign
 - Incorporate more contextual dimensions into the publication rules, i.e. publication time, location of target audience



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Thank You