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Martin BÃ¶hringer

Chemnitz University of Technology, martin.boehringer@wirtschaft.tu-chemnitz.de

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Martin Böhringer
Chemnitz University of Technology, Germany

Abstract

This working paper presents a formal comparison of microblogging and the traditional blogging stack facilitating RSS. The aim is to provide a better understanding of the differences and similarities of these two technologies. Our findings suggest that they use the same concepts (channels and items) but differ in the support of interaction between them. However, we argue that the foundation for the richer interaction experience of microblogging is its lack of interoperability and its centralistic approach. Therefore, future research should focus on combining the advantages of both RSS technology and microblogging.

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Martin Böhringer, Chemnitz University of Technology,

[*martin.boehringer@wirtschaft.tu-chemnitz.de*](martin.boehringer@wirtschaft.tu-chemnitz.de), [*http://twitter.com/boehr*](http://twitter.com/boehr)

1. Introduction

The characteristics of blogging can be described using three key principles (Karger & Quan 2005): the contents are short postings, these postings are kept together by common authorship under the control of the author and aggregation of multiple channels is easily possible. These principles also apply to microblogging. While the blogging functionality splits into different layers of a technology stack microblogging applications like Twitter cover the whole publishing-aggregating lifecycle (Table 1).

Table 1. Current Status Quo of the two standard technology stacks

	Blogging	**Microblogging**
Publishing Content	Blogging Tool	
'Middleware'	File Format, i.e. RSS	Microblogging service
Aggregating Content	RSS Reader	

However, one of the reasons for Twitter's success is its open API. Lots of users do not use Twitter's web client at all. They use 3rd party clients with richer functionality to publish and aggregate their content. This leads to a technology stack similar to blogging (Table 2). Other differences like decentralisation vs. centralisation and standard-compliance vs. proprietary API will be discussed later.

Table 2. The two technology stacks with respect to Twitter's API

	Blogging	**Microblogging**
Publishing Content	Blogging Tool	Twitter Client
'Middleware'	File Format, i.e. RSS	Twitter and its API
Aggregating Content	RSS Reader	Twitter Client

Table 2 clearly shows that the bottleneck of both blogging and microblogging is its transmission mechanism, its 'middleware'. This aorta of each technology might be the best starting point for a formal comparison of the technologies' capabilities. For this reason we chose RSS as the most used blogging file format and the API from Twitter as the most used microblogging service. After presenting background information we will compare these two from an information structuring point of view. Finally, we discuss the implications of our findings and future research possibilities before we close with a conclusion.

2. Background

2.1. Blogging and RSS

Blogging is a type of internet application with roots dating back to the early 90s. Using simple tools like Wordpress people easily can publish in the web. Most blogs offer an RSS feed as alternative distribution channel to allow users to aggregate contents of multiple blogs.

Basically, RSS is a family of XML file formats for the distribution of internet contents. The main advantage of RSS is that it provides a standardised way for publishing and subscribing to content (Leary et al. 2007). Originally created to broadcast news items from weblogs and news pages, it can be used for manifold types of information. The XML encoded news streams have become initial part of client technology such as major web browsers and MS Windows Vista (and MS Outlook) as well as of popular web publishing tools like blogging software (i.e. Wordpress).

There are different branches of RSS formats from different authors. RSS 0.92 and 2.0 translate RSS as 'Really Simple Syndication' while the acronym stands for 'RDF Site Summary' in RSS 1.0. The 'Really Simple Syndication' formats are widely adopted. However, they are not

compatible to RDF. For this reason RSS 1.0 might be the better alternative for the semantic web (Karger & Quan 2005).

2.2. Microblogging and Twitter

As the word's origin suggests microblogs are a smaller version of weblogs enriched with features for social networking. Users can post short updates into their public microblog. They can subscribe to other member's postings by adding them to their personal network and their updates are displayed in chronological order on the user's start page. Microblogging applications support a wide range of contribution possibilities including mobile text messages, desktop clients, instant messaging or integrated widgets. The leading microblogging service is Twitter (www.twitter.com).

Existing research on microblogging still is quite rare although fast rising. The majority of work includes descriptions and analyses of Twitter (Barnes & Böhringer 2009; Huberman et al. 2009; Erickson 2008; Krishnamurthy et al. 2008; Java et al. 2007). Others focus on microblogging as a learning tool (Ebner & Schiefner 2008; Skiba 2008; Ullrich et al. 2008). Less research has been published on the further development of microblogging from a conceptual point of view (Böhringer & Richter 2009; Böhringer & Röhrborn 2008; Passant et al. 2008) and on microblogging as a mobile application (Barkhuus et al. 2008; Gaonkar et al. 2008).

Opinions differ in the definition of microblogging. As Twitter shapes the understanding of microblogging its 140 character limitation is part of many definitions (e.g. Krishnamurthy et al. 2008; Java et al. 2007). Others emphasise the characteristics of microblogging as a broadcasting channel for information nuggets without an explicit addressee (e.g. Böhringer & Richter 2009, Zhao & Rosson 2008).

2.3. RSS and its relationship to Microblogging

RSS and microblogging belong to the world of web 2.0 respectively social software. As this field is remarkably driven by private companies this might be a good starting point for understanding the topic.

Technology analysts Forrester and Gartner predicted a great success of so-called 'Enterprise RSS'. Confusingly, this term was used in a broad variety of meanings. It could stand for using

enterprise-ready RSS readers, collaborative RSS feed portals/catalogues or providing enterprise information sources as RSS feed. Though, the hype on (Enterprise) RSS did not only refer to that primary technical standard but to the whole distribution lifecycle building on it. This includes creating of content, publishing and consuming it. The characteristic of this lifecycle is dictated by the file format's properties and for this reason it seems reasonable to use the label RSS for the whole technology stack including applications like feed readers and mashup creators. However, to ensure a clear understanding of our points in this paper we use 'RSS' for the family of file formats, 'RSS feed' for an information stream encoded in RSS and 'RSS technology' for the whole information sharing scenario built on top of it.

The term even was included in Gartner's Hype Cycle 2007 and Forrester recommended that companies 'should implement enterprise RSS solutions' (Young 2007). But suddenly the approach seems to be past the prime as it has become increasingly silent around the topic. Major 'Enterprise RSS' companies backed with two-digit million dollar amounts of venture capital ended their business or changed their focus. The leading technology blog ReadWriteWeb summarised this development in January 2009 with a heavily discussed article named 'R.I.P. Enterprise RSS' (Kirkpatrick 2009). As a result, 'Enterprise RSS' disappeared from Gartner's Hype Cycle 2008.

In the same year microblogging appeared in the Hype Cycle. It is the big topic in the internet these days and the analysts predict a bright future: 'By 2011, Enterprise Microblogging Will Be a Standard Feature on 80 Percent of Social Software Platform' (Gartner 2009). So, one hyped technology was changed against another. Is this what happened here?

3. Research Method

We are going to conduct a logical comparison of microblogging and blogging/RSS technology. Both terms are defined in many different ways. In this paper we focus on the general information management approach of the two technologies and therefore use an abstraction layer. First of all, we define this layer in introducing basic concepts and allocating referring concepts from our research subjects. We refer to them as 'Standard Blogging' and 'Standard Microblogging' as there are lots of different projects with different solutions and our aim is to show the approach shared by the broad masses.

For this reason we chose a leading solution for each technology as evaluation subject. For microblogging this clearly is Twitter. Blogging as an application stack consists of different layers but is restricted by the RSS standards. From a users point of view this means that blogging functionality is restricted by the features of one's RSS reader. There are no reliable usage statistics for this kind of software. To deal with that problem we chose the well-known Google Reader application as its vendor is one of the web's key drivers and there is ongoing development of the software.

4. Microblogging and RSS technology: a conceptual comparison

4.1. Shared Understanding of Vocabulary

Our argumentation bases on the idea of shared concepts between RSS feeds and Twitter microblogs. These two abstract concepts are 'channel' and 'item'. A channel in our understanding is a collection with entities from a single information source. An item is defined as single entity within such a collection. The following table shows the typically used names for the expressions of the concepts in the context of RSS feeds and Twitter Microblogs.

Table 1. Vocabulary of RSS and Twitter and their common understanding in this paper

	Basic Concept	RSS Feeds	Twitter Microblogs
Collection with entities from a single information source	Channel	Feed, Channel	Feed, Microblog
Singly entity within a collection	Item	(News) Item	Tweet, Posting

There is an obvious father-child relation between the concepts of channel and item by definition. To evaluate further links and annotations we will describe the concepts' implementation within our two research subjects in the following paragraphs.

4.2. Standard Blogging

Given the flexibility of the RSS specification the file format can be used for a lot of tasks. For this reason our comparison with Microblogging will not base on the functionality it could have but on the functionality really used by common RSS technology applications. This means, basically, functionality supported by standard RSS readers like the built-in reader of MS Outlook or Google Reader. We used the latter as reference application for our further argumentation.

The structural model of the RSS technology stack is a quite simple one. Its main use case is the delivery and aggregation of weblog and news website updates. One RSS feed in general stands for one information source i.e. a website or a news site's sub category. Feed items are ordered by their time of publication. RSS feeds do not interact in any dynamic manner as all outgoing links (e.g. in the <link>-tag or inside the content area) refer to a website rather than another RSS feed or feed item. Only the link to the HTML version of the blog entry can be machinable interpreted due to its XML encoding. All the other links inside the posting are HTML encoded using the <a href>-tag and therefore cannot be specified if they are showing i.e. to a reference. Using one of the links leads the user outside the RSS reader. Many feeds are limited in length. This means that only the N latest posts are included in the RSS file.

The user actions on feed items are very limited, too. To subscribe or not to subscribe is the only question a user has to answer. As with blogs users can post comments to the original article but have to leave the RSS technology stack and use the blogging software through their internet browser.

RSS readers offer different functionality for personal information management. Google Reader supports organisation of feeds into categories and tags as well as actions on single feed items (mark and comment it, tagging).

4.3. Standard Microblogging

Microblogging is a very new approach and there is no broadly accepted definition. We rely on the 'wisdom of the crowd' and choose the most popular service Twitter for our further argumentation. Other public available microblogging systems like identi.ca or Jaiku are very similar in their fundamental functionality.

Basically, as with RSS feeds a Twitter microblog stands for a single information source. This is mostly a single person but can also be a bot (i.e. automatically publishing blog posting headlines) or even technical devices (i.e. plants twittering with a special chipset). Feed items are chronological ordered by their time of publication. Microblogging enables different interaction methods between the concepts of channels and items. They are shown in Table 2 and explained in Table 3.

Table 2. Links between the concepts on Twitter

	Channel	Item
Channel	Following	Retweet
Item	@-Reference	Reply

Table 3. Description of Twitter's linking properties

Relationship	Type	Place	Description
Channel → Channel	Following	Channel Meta Data	One channel has another channel in its network and reads its updates (mostly a channel stands for a single user). The relationship is not *bijective* as the other channel does not have to follow back (this is different to most social networking sites).
Item → Channel	@-Reference	Item Content	The item text can refer to another channel using @<channel_name>. Example: item with text "writing a HICCS paper together with @userB" in channel "userA".
Channel → Item	Retweet	Item Content	This is a functionality introduced by users. They take items from other's channels and push it into their own together with an @-Reference (see Item → Channel) and sometimes a personal comment. Example: userA posts "writing a paper for the HICCS" and userB republishes it in her own blog "RT @userA writing a paper for the HICCS << wow, HICCS is a great conference!"
Item → Item	Reply	Item Meta Data	One item is a direct reaction to another (necessarily previous) item.

4.4. Comparison

4.4.1. Linking of channels and items

The only linking mechanism in RSS is using HTML hyperlinks inside the item's text. However, these links cannot be specified towards their semantic meaning (reference, citation, further reading, and recommendation) or their semantic type (another channel, another item, or something else like an ordinary web page). Microblogs provide a much richer linking between channels and items which cannot be achieved with RSS feeds. The linking as described in table 3 is achieved with simple text codes (@-Reference and retweet) or one-click user interactions (following, reply). These mechanisms make it extremely easy to contribute semantic annotated information. Figure 1 visualises these findings.

Figure 1. Visualization of channel/items interaction in RSS and Microblogging
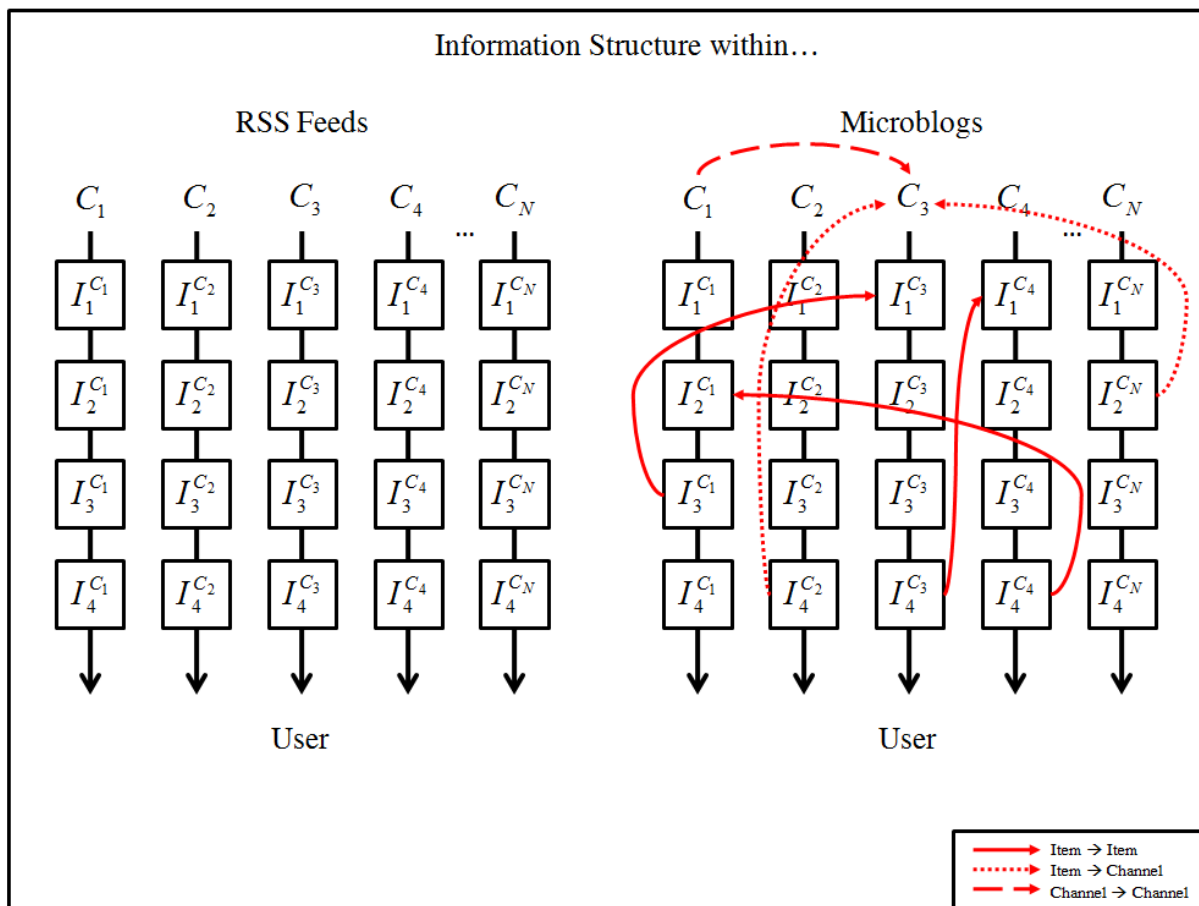
4.4.4. Centralisation approach

Twitter has a number of disadvantages due to its centralised application. Beyond them are:

- It is not built on proven web standards (full data access only via proprietary and restricted API)

- It is not robust (a system-error leads to the breakdown of the whole Twitter application with its millions of users)

- There is no flexibility (users cannot create own extensions in their microblogs)

- Users do not own their content (and have no chance to move)

The disadvantages of Twitter are typical shortcomings of monolithic applications. In particular, the last point 'users do not own their content' seems to be very critical. For this reason blogs were successful: everybody can host own content and syndicate it via standardised formats (i.e. RSS).

5. Discussion

Given the exponential increase of microblogging our research suggests that not the general principle of RSS was wrong and lead to a decrease in public attention: it was the lack of human participation - sharing, commenting, creating own feeds, interacting with information. Microblogging is a user-friendly frontend to the RSS format and the pub/sub mechanism for information distribution.

However, to enable this richer interaction experience, microblogging applications neglected some important fundamentals of the web, i.e. decentralized architectures. It is an important task for future research to develop methods for combining advantages of both approaches, RSS technology and microblogging.

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