

## Analysing the Penetration of Web 2.0 in Different Tourism Sectors from 2008 to 2012

Miriam Scaglione<sup>a</sup>, Roland Schegg<sup>a</sup> and Jean-Philippe Trabichet<sup>c</sup>

<sup>a</sup>Institute of Tourism,  
Applied University of Western Switzerland  
{miriam.scaglione, roland.schegg}@hevs.ch

<sup>b</sup>Geneva School of Business Administration  
University of Applied Sciences Western Switzerland.  
jean-philippe.trabichet@hesge.ch

### Abstract

The article "An Exploratory Field Study of Web 2.0 in Tourism (Schegg, Liebrich, Scaglione, & Ahmad, 2008) has received some interest, at least in the academic community. The authors claimed that Web 2.0 was in its early stage of adoption. The aim of the present research is to update those figures in order to show the evolution of this adoption over the last 4 years. Therefore, this paper updates the database from the 2008 study and also includes other sectors of the tourism industry. In total 4,700 websites of tourism enterprises in Europe have been analysed. The Web 2.0 techniques included in the analysis have also been updated and recategorized in light of the last 4 years of technological progress. Finally, the present article shows that, for some techniques, the take-off phase is finished; whereas some new techniques such as RDF are still at the very beginning of the adoption process.

**Keywords:** Web 2.0 penetration, diffusion of innovation, Social Media, external/internal channels

### 1 Introduction

The original research on the diffusion of Web 2.0 technologies carried out in 2008 (Schegg, et al., 2008) showed a low level of adoption of Web 2.0 features across tourism sectors. With the exception of XHTML, all the other technologies had a penetration rate of less than 1%. However, the study did not take into account the new Social Media (SM) which were starting to emerge. Amongst many others, social networks (Facebook, Twitter), online communities, and opinion and evaluation portals (TripAdvisor, HolidayCheck) are included in the list of new players. Technologies that enable content sharing (text, photos, and videos) have grown rapidly in recent years with the volume of user generated content (UGC) subsequently rising also and as stated by Murphy, Centeno Gila, & Schegg (2010, p. 466) "Social networks and social media channels disrupt the influence of marketing when consumers prefer collective expression in video clips, blogs and ratings of their peers to form opinions of products and services and to share experiences post purchase via electronic word of mouth".

Therefore, the analysis framework of Web 2.0 deserves to be updated. In 2007, Web 2.0 generally referred to two main streams of actions: user-generated content (UGC) and collaborative evaluation and technologies that improve user interfaces such as AJAX, RSS, APIs, mashups and tagging (Alby, 2007). Since 2007, new players in the Web 2.0 field have gained in importance and are now part of the marketing strategy

of tourism enterprises and organisations. The aim of the present research is thus to update the 2008 figures (Schegg, et al., 2008) by enlarging on the one hand the range of tourism sectors analysed and on the other hand by taking into account the technological and economic changes within the Web 2.0 landscape.

### 2 Literature review

#### 2.1 Enlarging Web 2.0 narrow concept

The concepts of UGC and Social Media are related. In the case UGC, it is because the former "can be seen as the sum of all ways in which people make use of SM" (Kaplan & Haenlein, 2010, p. 61). Despite the lack of a formal definition of an SM (Xiang & Gretzel, 2010), SM can be considered as a group of Internet-based applications having as its main characteristic the capacity to build on the ideological and technological foundation of Web 2.0 by allowing the creation, and exchange of UGC (cf. Kaplan & Haenlein, 2010, p. 61).

The literature review reveals different taxonomies of SM. In tourism, one of those classifications characterizes SM as either specialist or generalist media. Generalist media provide information about several providers (i.e. TripAdvisor); whereas specialist media are those that refer to only one provider, e.g. the destination management organization (DMO) of a specific region (Lim & Yoo, 2009). Another classification has as a basis the typology of communication/interaction channels, i.e. whether it is an external or internal channel. Internal channels comprise the use of Web 2.0/SM inside the website of an organisation; whereas external channels include active participation or content sharing on external sites such as Facebook, Flickr, YouTube (Shao, Dávila Rodriguez, & Gretzel, 2012). This research will use the classification proposed by (Shao, et al., 2012) of external channels as an extension of the Web 2.0 concept and it will measure their penetration.

Web 2.0 in the context of this study covers therefore the three following streams of actions: user-generated content (UGC) and collaborative evaluation using internal channels, the same using external channels and finally technologies that improve user interfaces.

#### 2.2 Web 2.0 penetration studies

Emerging research in tourism has found progress in the level of penetration of Web 2.0 including Social Networks (SN).

Studies in the Hong Kong hospitality industry (Leung, Lee, & Law, 2011, 2012) covered the followings aspects: Facebook, Twitter, RSS, TripAdvisor, Company Blog, Flickr, guest comments, Bookmark, Google Buzz, Google Maps and finally YouTube. The authors analysed the progress of Web 2.0 penetration and found that the penetration rate within the hospitality sector grew between February 2010 and August 2010 from 28% to 49%. They were also able to illustrate significant differences in the diffusion pattern between independent and chain hotels.

In terms of Facebook usage by DMOs, a study by (Stankov, Lazić, & Dragičević, 2010) showed that only half of National Tourism Organizations in Europe (NTOs) had an official Facebook presence. Related studies in 2008 and in 2010 took 25 top

European DMOs into account. In comparison with the 2008 data, in 2010 external features have been much more present on the DMO websites than *internal ones* (Shao, et al., (2012). In 2008, only seven DMOs had a direct connection with Facebook and only six to content sharing external sites like YouTube and Flickr; in 2010, however, all 25 DMOs had an official presence either on Facebook or Twitter (Shao, et al., 2012).

### 3 Data and methodology

#### 3.1 Data

A comprehensive sample across different tourism sectors and geographical regions helped explore the use of Web 2.0 by tourism enterprises. The present study sample was almost 5,000 websites (compared to less than 3'000 in the 2008 study by Schegg et al. 2008) from Swiss and international tourism enterprises. The sample and sources are described in table 1.

**Table 1:** Website sample per sector

Acronym	Sector	Source	Website age /n (URL)
DMO CH	Swiss DMOs	myswitzerland.ch	132/132
DMO AU	Austrian DMOs	(Klimek, Scaglione, Schegg, & Matos, 2012)	89/96
DMO GER	German DMOs	(Klimek, et al., 2012)	178/204
Rest CH	Swiss restaurants	Swisscom Directories	1812/1812
Cable CH	Swiss cable car companies	Seilbahnen Schweiz (seilbahnen.org)	190/190
Hotel Chain	International hotel chains	hotelsmag.com (July 2006)	262/262
TO Europe	European tour operators	etoea.org, european-travel-market.com	108/108
Hotel CH	Swiss hotels	(Scaglione, Johnson, & Trabichet, 2011)	1780/1780
TA CH	Swiss travel agencies	Schweizerischer Reisebüroverband (www.srv.ch)	238/238
Total unique URLs			4789/4822

#### 3.2 Data acquisition and analysis of Web 2.0

The study used a softbot, a software robot with exploratory and parsing capacities that runs automated tasks over the Internet (Steiner, 1999). Over half a century old, softbots are common in information technology (Bradshaw, 1997). A proprietary softbot (O'Rourke, Leclere, & Trabichet, 2012) was specially programmed and

optimized for this research. The softbot ran during June and July 2012 and processed all static and semi-dynamic HTML pages, starting at the top URL and then following all links in that website but ignoring links in graphics or behind dynamic scripting techniques. The softbot then generated a report containing the counts for each criterion. Table 2 lists the features, their definitions and the code searched by the softbot.

In order to update the original data base of (Schegg, et al., 2008), the authors manually checked all the URLs which the softbot failed to scan. The check consisted of a manual search for new domain names for the companies. When this search failed, the authors proceeded in the following way: First, they verified whether the domain name (DN) was available in a domain name registration service (i.e. www.switch.ch in Switzerland). Second, in the case of Swiss companies, the authors consulted the Swiss trade register in order to know if the company had been radiated. If the company had been radiated, the observation was deleted from the database. If the company had not been radiated, the authors analyzed whether the company was present in other places on the web such as in booking portals (Booking.com, TripAdvisor.com, etc.).

In total, the authors failed to find any active website for 157 restaurants and 45 hotels in Switzerland.

#### 3.3 Analysis of Web 2.0

Table 2 shows Web 2.0 technologies and softbot search criteria. In comparison with the criteria used in Schegg et al. (2008) some changes were made. RSS and Atom are evaluated no longer separately but in the same category because they provide similar services. XTLM is no longer evaluated but the authors included a HTML5 instead as its use among developers is sharply on the rise and suggested as the sole next-generation HTML standard by W3C (www.w3.org/2009/06/xhtml-faq.html).

As pointed out in the literature review above, there are some news categories included in the present research. The first one is Resource Description Framework (RDF) a semantic web standard which supports the mashing up of data typical for the Web 2.0 (www.w3.org/rdf). The evaluation of links from websites to external channels as defined by Shao et al. (2012), specifically Facebook, Twitter and Google+, sought to measure the adoption of SM by tourism enterprises. Micro-blogging which the reader should not understand as Twitter, is a broadcast medium in the form of blogging, but with smaller file size than a typical blog. Finally, the authors evaluated the inclusion of TripAdvisor, one of the major evaluation portals in the tourism sector.

**Table 2:** Web 2.0 technologies and softbot search criteria

	Description	search expressions in softb
RSS, Atom,	Really Simple Syndication (RSS) provides subscribed users with notification, (RSS feeds) when content changes for chosen websites (Hanson & Kalyanam, 2007, p. 80). The Atom Syndication Format is an XML language for web feeds, while the Atom Publishing Protocol is a simple HTTP-based protocol for creating and updating Web resources. ( <a href="http://tools.ietf.org/html/rfc4287">http://tools.ietf.org/html/rfc4287</a> )	w3.org/2005/Atom; type="application/rss+xml";
RDF	"The Resource Description Framework (RDF) is a framework for representing information on the Web. RDF Concepts and Abstract Syntax define an abstract syntax on which RDF is based, and which serves to link its concrete syntax to its formal semantics. It also includes discussion of design goals, key concepts, datatyping, character normalization and handling of URI references."( <a href="http://www.w3.org/standards/techs/rdf#w3c">http://www.w3.org/standards/techs/rdf#w3c</a> )	rdf:RDF
AJAX	AJAX (Asynchronous Javascript and XML) integrates technologies to make user information retrieval experiences smoother and faster, such as applications in Google Maps and Flickr (Laudon & Traver, 2007, p. 229).	XMLHttpRequest(;Microsoft MLHTTP;
Wiki	"Collaborative efforts among large number of volunteers rapidly creates useful and free new products"(Hanson & Kalyanam, 2007, p. 383) As a hypertext-based, multiple-cooperated writing system, wiki allows anyone to browse, create and revise, to access the ever-increasing number of texts.(Huang & Yang, 2008)	wiki;mediawiki;content="mediawiki;content="mediawiki:con nce;name="confluence;name nfluence
Folksonomy	A neologism from "taxonomy" for a collaborative, spontaneous and decentralized classification. The prefix "folk" signifies that contributors ignore predefined; free to classify resources. It is equivalent to "keyword" or "tag" (O'Reilly, 2005)	/tag;/tagcloud;class="tag;class ag;id="tag;id="tag
Blog	Website (= web log) with frequent postings, often focused on a certain topic, and typically organized chronologically. Blogs may be individual or collaborative (Hanson & Kalyanam, 2007, p. 594)	content="blogger;content="blogger; content="WordPress;content="WordPress;content="Movable Type;content="Movable Type;content="http://www.p ad; content="http://www.type
Podcast, videocast	A digital audio or video program that is available for download. They are playable through a computer or digital player including Ipod and mp3 players (Hanson & Kalyanam, 2007, p. 600).	.mp4;.flv;.wmv;.ra;.rm;.rv;.m wav;youtube.com;dailymotion;video.yahoo.com;vimeo

	Description	search expressions in softb
Social media	Social media offer a social plugin to external pages to comment posts of the users i.e. Facebook, google+; Twitter (Urueña, Muñoz, & Larrabeiti).	fb-like; fb:like;<g:plusone;apis.google m/js/plusone.js;twitter.com/ir t/follow
Micro blogging	Micro-blogs in turn belong to the big family of social media: "group of Internet-based applications that build on the ideological foundations of Web 2.0, and that allow the creation and exchange of user generated content. On the continuum of social media classification, micro-blogs stand halfway between traditional blogs and social networking sites". (Kaplan & Haenlein, 2010)	widgets.twing.com;api.tumb om;
syndication (mash-up) - géographique	Mashup is defined as "a Web application that combines data from one or more sources into a single integrated tool" (Wikipedia). Mashup allows users to integrate different kinds of sources together (Junjian, Huajun, & Yu, 2009).	maps.googleapis.com; api.maps.yahoo.com; dev.virtualearth.net; axe.mappy.com; www.mapquestapi.com; api.maps.o vi.com <!doctype html>
HTML5	The HTML5 represents extreme simplification of web content creation and by the generality of browsers, alleviation from the needs of complex plug-ins. These new features are ensured by completely new syntactic elements (like <video>, <audio>, <canvas>), by hooks toward other standards or by extending existing elements for recent interaction modes. The <canvas> element is the enabler for real-time drawing of complex graphical content and allows for dynamic updating and creation of the web content on the fly by using JavaScript (Ganji, Mitrea, Joveski, & Preteux, 2012)	
TripAdvisor	Travel social network, which aims to allow tourists to share their experience with others by writing comments of travel destinations such as historical attractions, hotels and restaurants. (Palakvangsa-Na-Ayudhya, Sriarungrung, Thongprasan, & Porcharoen, 2011)	href=http://www.tripadvisor.c /

**4 Results**

Table 3 shows the penetration level on the same data base as in Schegg et al. (2008). In 2008, the level of penetration of all Web 2.0 features tested was less than 1% except for XHTML; in the present research and with the exception of RDF and micro-blogging, all the levels are greater than 1%.

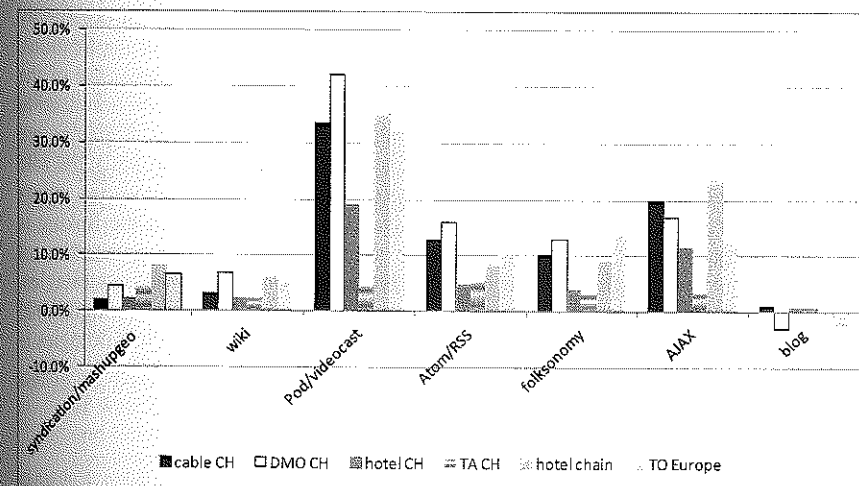
**Table 3.** Levels of penetration of different Web 2.0, the total number of softbot scanned websites is in the first column. The shadowed rows contain percentage of penetration.

	Podcast / videocast	AJAX	RSS/ Atom	Folk- sonomy	SM	HTLM L5	Wiki	syndic ation/ mashu p-geo	Blog	TripAd visor	RDF	Micro messag ing
p-value	<0.000	<0.1	<0.000	<0.000	<0.000	<0.1	<0.000	<0.000	N/S	<0.000	N/S	<0.1
cable CH N=188	<b>73</b> <b>38.8</b>	<b>37</b> <b>19.7</b>	<b>34</b> <b>18.1</b>	<b>19</b> <b>10.1</b>	16 8.5	13 6.9	6 3.2	4 2.1	<b>6</b> <b>3.2</b>	2 1.1	1 0.5	1 0.5
DMO CH N=131	<b>57</b> <b>43.5</b>	25 19.1	<b>21</b> <b>16.0</b>	<b>17</b> <b>13.0</b>	<b>19</b> <b>14.5</b>	<b>12</b> <b>9.2</b>	<b>9</b> <b>6.9</b>	6 4.6	2 1.5	<b>5</b> <b>3.8</b>	0 0.0	0 0.0
DMO AU N=96	<b>83</b> <b>42.3</b>	<b>30</b> <b>15.3</b>	<b>21</b> <b>10.7</b>	<b>27</b> <b>13.8</b>	<b>38</b> <b>19.4</b>	<b>14</b> <b>7.1</b>	<b>19</b> <b>9.7</b>	<b>19</b> <b>9.7</b>	2 1.0	1 0.5	0 0.0	1 0.5
DMO GER N=166	49 29.5	17 10.2	<b>23</b> <b>13.9</b>	<b>27</b> <b>16.3</b>	14 8.4	7 4.2	<b>13</b> <b>7.8</b>	<b>10</b> <b>6.0</b>	2 1.2	0 0.0	2 1.2	0 0.0
hotel CH N=1709	329 19.3	201 11.8	84 4.9	67 3.9	58 3.4	60 3.5	38 2.2	37 2.2	18 1.1	22 1.3	3 0.2	7 0.4
hotel chain N=259	92 35.5	<b>63</b> <b>24.3</b>	22 8.5	<b>25</b> <b>9.7</b>	<b>23</b> <b>8.9</b>	18 6.9	<b>16</b> <b>6.2</b>	<b>21</b> <b>8.1</b>	3 1.2	<b>13</b> <b>5.0</b>	3 1.2	7 2.7
Rest CH N=1613	366 22.7	214 13.3	111 6.9	72 4.5	45 2.8	60 3.7	32 2.0	30 1.9	22 1.4	6 0.4	6 0.4	2 0.1
TA CH N=236	57 5.0	25 4.0	21 6.0	10 3.6	6 2.5	<b>19</b> <b>9.0</b>	4 2.8	6 4.3	1 1.7	0 0.0	2 11.8	3 17.6
TO EU N=105	<b>38</b> <b>36.2</b>	16 15.2	12 11.4	<b>15</b> <b>14.3</b>	<b>20</b> <b>19.0</b>	9 8.6	6 5.7	7 6.7	3 2.9	4 3.8	0 0.0	2 1.9
Total N=4503	1144 25.4	628 13.9	349 7.8	279 6.2	239 5.3	212 4.7	143 3.2	140 3.1	59 1.3	53 1.2	17 0.4	17 0.4

The  $\chi^2$  test (df=8) shows whether the penetration rates of each web 2.0 feature is significantly higher (in bold in table 3) or lower (in italic in table 3) than expected for each sector. Syndication/mashup-geo, TripAdvisor, RDF and all the others features show significant differences in the percentage of penetration depending on the sectors. Specifically speaking of SM, the percentage of penetration is significantly higher for Swiss, German and Austrian DMOs, hotel chains and European Tour Operators, and significantly lower for Swiss hotels and restaurants.

**Table 4.** Penetration rates (in %) of Web 2.0 features by sector: 2008 and 2012

Sector	Cable car CH		DMO CH		hotel CH		TA CH		hotel chain		TO Europe	
	2008	2012	2008	2012	2008	2012	2008	2012	2008	2012	2008	2012
Syndication / mashup-geo	0.0	2.1	0.0	4.6	0.0	2.2	0.0	4.3	0.0	8.1	0.0	6.7
wiki	0.0	3.2	0.0	6.9	0.0	2.2	0.0	2.8	0.0	6.2	0.0	5.7
Podcast/videocast	5.2	38.8	1.5	43.5	0.1	19.3	0.0	5.0	0.4	35.5	3.6	36.8
Atom/RSS	5.2	18.1	0.0	16.0	0.0	4.9	0.0	6.0	0.0	8.5	0.0	11.4
folksonomy	0.0	10.1	0.0	13.0	0.1	3.9	0.0	3.6	0.4	9.7	0.0	14.3
AJAX	0.0	19.7	2.2	19.1	0.1	11.8	0.0	4.0	0.7	24.3	1.8	15.2
blog	2.1	3.2	4.5	1.5	0.2	1.1	0.8	1.7	1.5	1.2	5.4	2.9



**Fig. 1.** Penetration rate difference (2012 vs. 2008) by sector

Table 4 and figure 1 show that the Web 2.0 feature that has the highest progression is Videocast/Podcast, followed by AJAX and at almost the same level Atom/RSS and folksonomy. The only feature showing a negative difference is blog, probably due to the growth of external social channels such as social networks.

## 5 Discussion and conclusions

As the rapid adoption of smartphones and tablets illustrates, the spread and performance of ICT technologies is still increasing. It can be assumed that with the development of the mobile Internet, tourists will increasingly exchange and share their experiences online already during their journey. Therefore, tourism enterprises,

especially SMEs, which cannot cope with this change and satisfy the needs and wants of today's always-online, always-connected travellers may soon face serious difficulties. Web 2.0 goes beyond pure technological aspects and requires reengineering of marketing paradigms and changes in operational business processes.

As stated by Schegg et al. (2008), the Web 2.0 empowers tourists in unique ways and may open interesting opportunities for tourism enterprises to interact and exchange with travellers during the planning and buying process and to develop services that are really perceived by customers as value-added offerings. Within the framework of the present explorative study, it could be shown that differences exist between the different tourism sectors and that the uptake of these Web 2.0 technologies has rapidly advanced compared to the situation in 2008. Tourism enterprises seem to be aware today that assimilating these technologies is important and can add customer value. Mainly tourism organisations and tour operators seem to be leveraging the opportunities of the Web 2.0, perhaps due to the fact that intermediaries are under strong pressure from suppliers and travellers and have to provide added value to stakeholders.

The present study has several limitations, however. For example, the softbot simply searched pages for the presence of common Web 2.0 technologies and applications. There is, however, no proof that these features are actually used in the sense of the Web 2.0 paradigm. The technologies could be even used by applications unrelated to Web 2.0. Finally, as many of the activities related to social media strategies are operated on company-external platforms (such as YouTube, Facebook, etc.), the sole analysis of Web 2.0 features on the website of the tourism enterprise might underestimate the implementation level in the sector, especially when the linking is missing. Future research should focus on the impact that the higher penetration of Web 2.0 technologies might have on the effectiveness of online marketing strategies. In this context it would be interesting to measure, based on an analysis of longitudinal data from industry case studies, whether the increased use of Web 2.0 technologies is related to the (online) marketing success of tourism organizations.

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