



# SYSTEM DYNAMICS USE IN BLOGOSPHERE DEVELOPMENT SIMULATION

## SISTĒMU DINAMIKAS PIELIETOŠANA BLOGOSFĒRAS ATTĪSTĪBAS MODELĒŠANĀ

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**Abstract.** *Today the Latvian blogosphere is a community of almost 200 000 blogs. Blogs have become an important part of news agencies and web portals because they deliver information to the reader faster than traditional media. To forecast the computational resources and necessary funding for community development, it is necessary to design an evolutionary model based on the data collected and give an insight into its evolution ways.*

**Keywords:** *blogosphere, simulation, STELLA, system dynamics.*

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### Introduction

The mineral wealth of Estonia – oil shale - is located in a densely populated and The creator of the first blog is believed to be Justin Hall, who created his first public web diary Links.net in 1994 while studying at Swarthmore college in Pennsylvania, USA [1]. On December 23<sup>rd</sup> 1997 Jorn Barger decided to create RobotWisdom.com for the purpose of publishing links to other websites and adding commenting on them. He called his site a “Weblog”. This term was soon used by other online publishers until in 1999 Peter Merholz transformed Bargers “Weblog” into “We blog”. For the sake of shortness, soon all online journals were referred to as blogs.

The simplest way to determine if a website can also be referred to as a blog, is to check it for some of common indicators. A website can be referred to as a blog if it has appropriate characteristics. Firstly, a blog is a type of website that is usually arranged in chronological order from the most recent entry at the top of the main page to the older entries towards the bottom [2]. Secondly, the content must be unfiltered. As soon as the authors’ opinion gets censored or edited, it is not a blog [3]. Furthermore, every blog has the possibility to leave comments, publishes links to other resources and contains content written in an informal manner [4].

Since 2002 Technorati has indexed more than 133 million blogs worldwide. They are currently tracking 112, 8 million blogs in 81 languages from 66 countries on six continents. The authors are unbelievably active and, according to Technorati, 175 000 blogs are created each day. Many blogs are updated each day which reflects as 1.6 million new entries each day. That is 18 new publications every second [5].

The Latvian blog community or blogosphere has been evolving rapidly since its beginnings. In the beginning of 2008 8% or 151 000 of the Latvian population between the ages of 15 and 74 were reading or writing blogs. Most blog readers or creators are pupils, students or managers between the ages of 15 and 39 [6].

The Latvian blogosphere is constantly evolving but there is lack of research that analyzes its current situation and the determinative factors. There is no information about the blogospheres further evolution, its affect on traditional media and the place of blogs in information exchange processes. Therefore the aim of this article is to propose an evolution model of the Latvian blogosphere based on empirical data which would empower Internet service providers to forecast necessary computing resources and funding.

### Sustainability and development of the Latvian blogosphere

The Latvian blog community, according to various sources in the blogosphere, began its existence in 2000 with the technology blog pods.lv, then under a different domain. Although at first the blogs publications resembled an online magazine, as once a month a compilation of several entries was made available, pods.lv can be considered a wholesome parent of the Latvian blogging culture.

Several new sites (see Table 1), that merit their popularity not only from successful self-advertising but quality content and individuality as well, have been created since the emergence of the first Latvian blog.

Table 1.

**The 10 most popular Latvian blogs (at the end of 2008) according to the Latvian RSS top (<http://www.onkulis.com/rss-tops/>) and Feedburner.com data**

<i>Blog name</i>	<i>RSS readers</i>
Catonmat.net	3072
Laacz.lv	1267
Journal.lv	884
Pods.lv	855
Krizdabz.lv	769
Onkulis.com	667
Arturs.jaffa.lv	574
Nemirst.lv	545
Zloj.com	420
Archija.info	408

By the end of 2008 there were approximately 500 self-hosted blog platform blogs, as well as 200 000 blog service blogs in Latvia. Furthermore, several corporate and expert blogs, as well as RSS feed aggregators, which republish content from various blogs, have been developed.

One of the first Latvian corporate blogs was set up in November 2007 for Amigo, a trademark of Zetcom Ltd [7]. This blog serves company employees as a platform to interact with their clients and publish information in an informal manner. Latvian telecommunications company Lattelecom, as well as the editorial staff of the news portal Delfi have created their corporate blogs to give insight into the undertaking from an employee's point of view.

Expert blogs began their upswing early in 2008 when nearly every news portal and mass media agency created specific blogs for professionals in their respective fields. One worth mentioning is Nozare.lv created by Latvian news agency LETA. At the time of writing Nozare.lv consists of 25 professional blogs that share opinions and knowledge on everything from agriculture to technology. The two most popular Nozare.lv bloggers are telecommunications and IT journalist Juris Kaža and internet and mass media blogger Uldis Zariņš [8]. Latvia's largest newspapers Diena and Dienas bizness have established their own expert blog sections as well.

Three news aggregators have consolidated their niche in Latvia – Tribine.lv, Lasi.lv and Neku.lv. Tribine.lv and Lasi.lv are considered civic journalism portals as all news are added by the readers themselves. Only a few trusted news sources are republished automatically. Readers have the opportunity to rate, comment and view the original source of every news entry.

A couple bigger and smaller blog service providers, which tempt potential bloggers with free and paid services, have introduced themselves in recent years.

### The evolutionary model

Observation, as a data collection method, was used for collecting blog service data. In these cases the total number of blogs, as well as the amount of active blogs, entries and comments was

determined. Information that is available on the blog service providers' website, for example, statistics on klab.lv, also counts as observation data.

Respondents were surveyed electronically with a questionnaire hosted on Visidati.lv. Links to the survey were published on Orb.lv and the news aggregator Lasi.lv. The survey consisted of 23 questions and was publicly available from October 21<sup>st</sup> to November 8<sup>th</sup> 2008. During this time it was filled in by 146 respondents of which 108 were male and 38 female between the ages of 14 and 52.

Finally, the data tables involving five data sets which describe most popular blog service providers in Latvia were created:

- Blog count – shows the number of hosted blogs per blog service provider;
- Active blogs – shows the number of active blogs per blog service provider. The term “active” refers to blogs that have updated content at least once in the last 30 days;
- Entries – the total count of blog entries per blog service provider;
- Deleted blogs – the total count of deleted blogs per blog service;
- Comments - the total count of blog entry comments per blog service provider.

The sixth data set consisted of blog emergence per month data is gained from the conducted survey.

To collect the initial data for the simulation model, the data were analyzed for compliance to statistical distributions by utilizing the Kolmogorov – Smirnov test. Some typical distributions like Poisson and lognormal were tested. The assumption, that the calculated data is statistically valid for use in the simulation model and corresponds to a normal distribution, was put forward as the zero hypothesis.

The analyzed data would comply with the normal distribution and the zero hypothesis can not be dismissed, because all Asymp. Sig. (2 – tailed) values are > 0.05, which means that the average values of every data set are statistically valid and can be used in model development (see Table 2). Of course, it is understandable that number of series (only 7) is not enough for good statistical solution and Z-value in Kolmogorov-Smirnov test is higher than critical if alpha=0.05, but for justification the tendencies of the development the results would be good enough. Testing of the rest distributions given worse results.

Table 2.

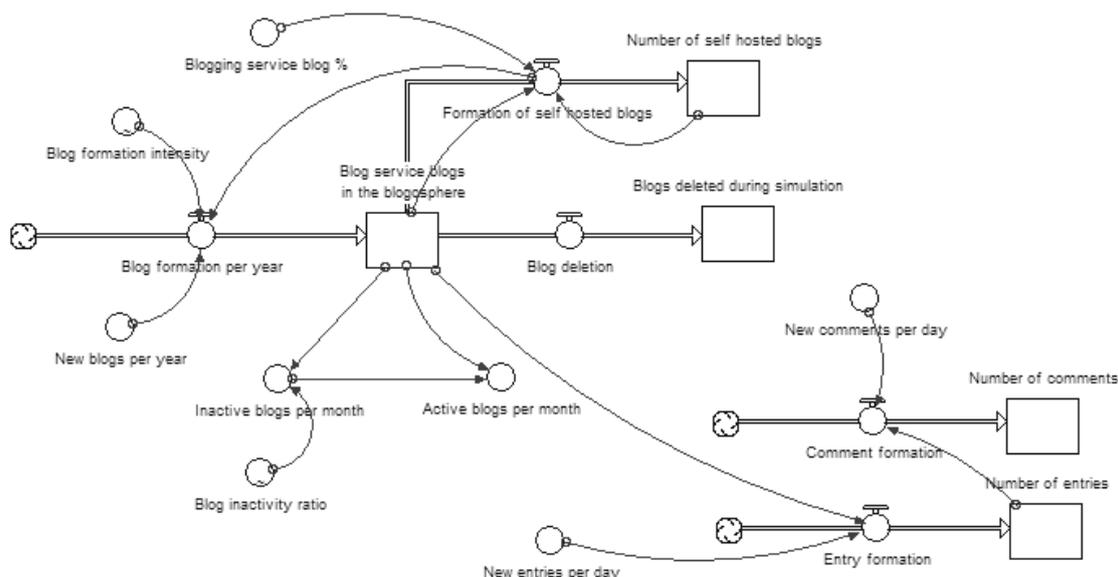
**Blogs data set verification by Kolmogorov-Smirnov test**

		Blogs per day	Entries per day	Comments per day	Deleted per day
N		7	7	7	7
Normal Parameters <sup>a,b</sup>	Mean	30,0314	33,3429	55,2129	,2543
	Std. Deviation	70,71362	26,31072	54,71461	,39841
Most Extreme Differences	Absolute	,474	,281	,206	,302
	Positive	,474	,281	,206	,302
	Negative	-,339	-,232	-,206	-,262
Kolmogorov-Smirnov Z		1,253	,742	,546	,798
Asymp. Sig. (2-tailed)		,087	,640	,927	,548

a. Test distribution is Normal.

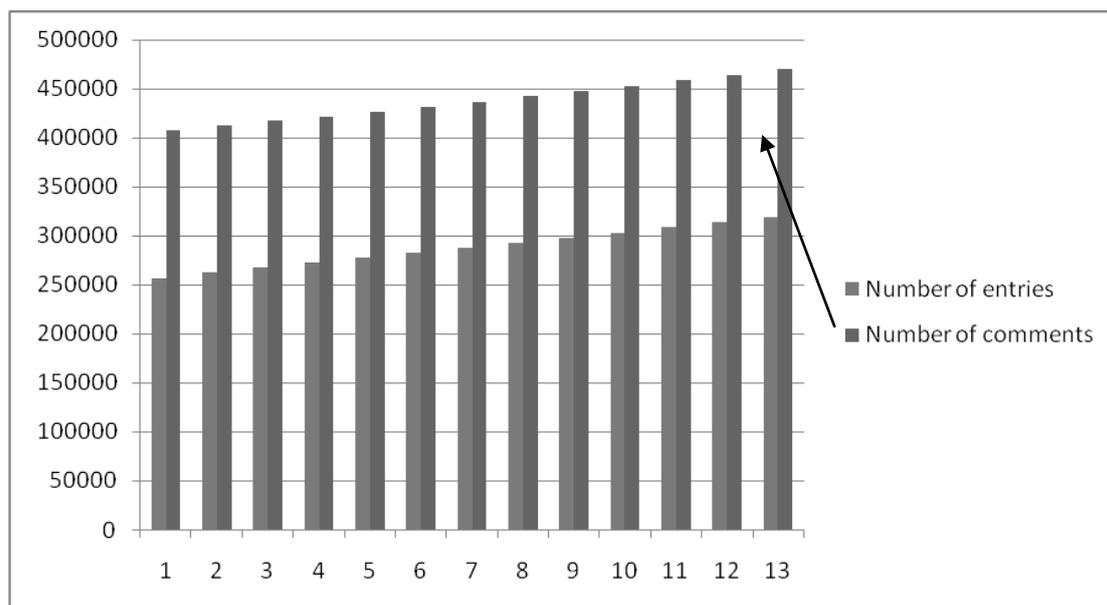
b. Calculated from data.

The designing of the evolutionary model of the Latvian blogosphere was performed in the STELLA modeling environment [9]. The model consists of 32 elements of which subdivide into 5 flows, 5 stocks, 8 converters and 14 connectors (see Fig. 1).



**Fig. 1. The Latvian Blogosphere model in the STELLA system dynamics environment**

The model was verified by using a checking calculation. A full modeling cycle of 12 months was chosen and calculations were carried out for all five stocks. The results of simulation show that the number of comments will increase in proportion to the number of blog entries (see Fig. 2).



**Fig. 2. Prognosis for blog entry and comment number growth**

Faster increase in the amount of blog entries and comments can be seen at the beginning and end of the year which is self-evident due to the similar growth tendencies of blogs. Stagnation of entry and comment numbers will not be observed as active blogs will continue to generate content that readers will comment. Additionally, the amount of blog entries will increase due to newly created inactive blogs. This is because most blog service providers automatically create a test entry in a newly created blog to show the user how published information will look to a reader. However, most users delete or personalize this test post when they start to actively use the blog, so it would be wrong to declare that every created blog creates one useless entry.

Serious fluctuations in the growth of blog entries and comments could only be caused by massive deletion of inactive blogs, though such a scenario is incredible.

In 2008, in order to gain more readers, the tendency to republish self-hosted blog content in blog service appeared. It is to be expected that this tendency will continue in the next year and that even more bloggers will distribute their content this way. This republished content will add to the growing number of blog entries and also spawn more reader comments.

### **Conclusions**

The evolutional model of the Latvian blogosphere in STELLA environment is the first blog coherence and progress process simulation tool in Latvia. It is designed to be an instrument for analysis of tendencies in blogs development. It enables to investigate and manage typical processes (blog formation, disappearance, proportion of active and inactive blogs) on the Latvian blogosphere.

Simulation results confirm statements made by Latvian bloggers and field experts that in 2008 Latvian blog community has reached its height and during the next 12 months a slowdown of blogospheres growth is predictable. Blog entry and comment numbers will continue to rise, however new content will be generated slower and the amount of new entries will be smaller than in previous years.

Due to this slowdown of progress, it is foreseeable that the number of readers and RSS subscribers will consolidate rather than increase. Even though many people will discover the blogosphere as a new information source, it is unlikely that blog reader numbers will double as it was at the end of 2007. New bloggers will maintain their place in the community and be responsible for a large part of newly generated content.

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