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**ΓΕΩΡΓΙΟΥ ΛΟΥΚΑΣ MBA EXECUTIVE**

**EVALUATING 10 Proxy servers' Web Sites**

## Evaluating Proxy servers' Web Sites.

**Abstract:** This paper is trying to give some aspects in evaluating proxy servers' web sites. Due to the wide use of these servers, the evaluation will focus in general characteristics that apply to all kinds of proxies. The web sites are b2b and b2c oriented.

### Introduction

#### What a proxy server is:

In computer networks, a **proxy server** is a server (a computer system or an application program) that acts as an intermediary for requests from clients seeking resources from other servers. A client connects to the proxy server, requesting some service, such as a file, connection, web page, or other resource, available from a different server. The proxy server evaluates the request according to its filtering rules. For example, it may filter traffic by IP address or protocol. If the request is validated by the filter, the proxy provides the resource by connecting to the relevant server and requesting the service on behalf of the client. A proxy server may optionally alter the client's request or the server's response, and sometimes it may serve the request without contacting the specified server. In this case, it 'caches' responses from the remote server, and returns subsequent requests for the same content directly. [From Wikipedia, the free encyclopedia]

#### Why using a proxy

The Internet quickly became an essential and integral part of today's life. However, the booming use of the Web has caused congested networks and overloaded servers. So, the answer from the remote Web server to the client often takes along time. Adding more network bandwidth is a very expensive solution. From the user's point of view it does not matter whether the requested files are on the firm's computer or on the other side of the world. The main problem is that the same object can be requested by other users at the same time. Because of this situation, identical copies of many files pass through the same network links, resulting in an increased response time. By preventing future transfer, we can cache information and documents that reduces the network bandwidth demand on the external network. Requested documents can be delivered directly from the Web server or through a Proxy Cache Server (PCS)

A proxy server has many potential purposes, including:

- To keep machines behind it anonymous (mainly for security).
- To speed up access to resources (using caching). Web proxies are commonly used to cache web pages from a web server.
- To apply access policy to network services or content, e.g. to block undesired sites.
- To log / audit usage, i.e. to provide company employee Internet usage reporting.
- To bypass security/ parental controls.
- To scan transmitted content for malware before delivery.

- To scan outbound content, e.g., for data leak protection.
- To circumvent regional restrictions.

A proxy server can be placed in the user's local computer or at various points between the user and the destination servers on the Internet.

## **Types of proxies**

### **Web-based Proxies:**

Web-based Proxies are powered by server-side softwares such as CGIProxy, PHProxy, Glype, and custom proxy scripts. These proxies work entirely through a Web browser. Usually all that is needed to hide your IP address and surf anonymously is to visit the service's homepage in a Web browser and enter a URL (website address) in the form provided. There is no requirement to download or install software or reconfigure your computer. To work, a CGI based proxy must manipulate the document you've requested and all its associated elements and objects. This can be tricky, and not all proxies are as efficient or effective as others. Some services are slow and may produce errors while rendering the many variations of Web page code. But they are popular, numerous, and easy to use.

### **Open Proxies:**

So-called "open proxies" are HTTP or SOCKS type proxy servers that are accidentally or maliciously left "open" and accessible on the Internet. HTTP or SOCKS type proxy servers require that you configure your browser's proxy settings in order to use them. These proxies have the advantage of being compatible with almost all webpages since they do not have to modify the requested page to keep you anonymous. However, there are several major disadvantages to using open proxies. Many utilize computers that are compromised, operated by government agencies, or operated by malicious individuals. Often when an attacker obtains control of an end-user's computer they will install a proxy server so the machine can be exploited to launch further attacks on other machines. It is also commonplace for open proxies to be operated as "honey pots", where all actions are logged for forensic research. Open proxies are easy to abuse and there are many people using them to commit credit card fraud, pay-per-click fraud, attack or break into computers, and hundreds of other illegal activities.

### **Proxy networks:**

Various proxy networks (Freenet, I2P, JAP, and TOR) feature layered encryption (sometimes called "onion routing") and peer-to-peer networking to allow their users to communicate anonymously with each other. Rather than operate their own equipment, most rely on end-users to donate bandwidth and other resources to the network. They do not control the servers in their network and certainly a percentage of them are operated by malicious individuals for malicious reasons. Therefore any promises of privacy and security should be evaluated with this in mind. Also, these services have developed a reputation for being relatively slow.

### **Proxy Software:**

Other subscription-based services offer client-side application software to automatically configure your browser's proxy settings. Most are merely open proxies dressed up with a fancy interface.

### **Research Methodology**

First, it presents an evaluation framework which consists of 25 criteria organized into 5 evaluation categories. Then, 10 websites are grading in a scale from 1-10 for each criterion using the evaluation framework.

The results are gathering so the best site over all identified and finally some analysis in the scoring will follow.

### **Criteria and framework**

In order to perform an evaluation, it is needed a comprehensive evaluation framework containing quality criteria. These quality criteria must be relevant to the customers' needs and demands. For example, is it easy to use the web site? Does the web site offer useful services? it must also indicate the **perceived service quality**, a recurring research issue for both the Marketing and IS disciplines (Parasuraman et al., 1988; Fisk et al., 1993; Pitt et al., 1995). Parasuraman et al., (1988) identified five dimensions which consumers use to evaluate service quality. They are **tangibles** (The physical facilities), **reliability** (ability to perform the promised action dependably and accurately), **responsiveness** (to offer help to its customer on a timely fashion), **assurance** (to inspire trust and confidence) and **empathy** (to care and individualized attention given to its customers).

For evaluating St. Petersburg e-government sites, Merkurjeva et al. (2003) suggested three categories of criteria: **functionality**, **accessibility** and **usability**. Wood et al. (2003) suggested a multidimensional approach where web evaluation methods fall into four major classes: Usability testing, User feedback, Usage data and Web and Internet performance data

Previous studies on web sites evaluation (Loiacono et al., 2002; van der Merwe and Bekker, 2003) used criteria classified in categories such as **Interface**, **Navigation**, **Content**, **Reliability**, and **Technical**. **Self-efficacy**, **financial cost**, **credibility**, **ease of use** and **usefulness** were also proposed as criteria (Luarn and Lin, 2003)

Considering the above facts, the framework consist the following structure.

### **Criteria used in evaluation categories**

- **Authority:** Who are the authors of the Web page, or who is responsible for it? What gives them their authority or expertise to write? **Trust.** Trust refers to the extent to which customers believe the web site is **legal**, **ethical** and **credible** and is able to **protect their privacy** (Wan, 2000). According to a survey conducted by the European Electronic Messaging Association, more than 79 percent of respondents said that **reliability** is the top concern of e-commerce customers (Shankar, 1996). Once users perceive that reliability has been compromised, no purchase will be made. It is therefore crucial for systems designers to understand the effect of cumulative frustration, especially as it is typically in the later stages of interaction that users are likely to commit to a purchase (Bhatti et al., 2000).

Trust can be defined as feeling secure about relying on an entity. It has positive influence on the development of positive customer attitude, intention to purchase, and purchasing behaviors (Swan, et al., 1999) Security: Security of the databases and of the EIT processes must be inviolable, because breaches therein are hard to detect and even harder to correct (Gustin et al., 1997; Sarkis and Sundarraj, 2000).

- **Accuracy-Coverage:**

Do you have good reason to believe that the information on the site is accurate? Are the facts documented? **Information relevance** refers to the extent to which the information on the web site is related to the information needs of the customer. It is unlikely that a company wants to provide the same information to different groups of customers (Huizingh, 2000). Different parts of the web site should be designed to meet the needs of different group of customers. The potential customers of the web site should be identified and their needs are investigated (Clyde, 2000). **The informational or knowledge component** is an increasingly important part of the product offering today (Glazer, 1991).

**Empathy** refers to the extent to which a web site provides caring, individualized information and attention to customers. Empathy is the presence of response mechanisms for improving the communication quality of web sites. The nature of this dimension, purports that two-way communication must exist. Features included in this dimension are e-mail, chat rooms, bulletin boards and mailing lists (Chen, 2001). **Objectivity:** What is the author's point of view? What is the purpose of the site? **Currency** When was the information on the page originally written? Has the site been kept up-to-date?

- **Appearance:**

**Attractiveness** consists of the issues of whether web pages are fun to read and subjectively pleasing. Watson et al. (1998) coin the concept of “attractors”. They use the metaphors to label group sites into different potential attractors (e.g. Entertainment Park, archive and club). They argue the overall appeal is a key component of web site quality. No matter how well the content is or how reliable and easy to search the web site is, if users do not find the site appealing, they are not going to spend much time there (Smith and Merchant, 2001). Chen (2001) examines the **playfulness** and how it affects the quality of web site design. His finding suggests that playfulness is an influential factor to attract customers. Is the site free of careless errors, misspelled words, and poor grammar? It looks at Web site **architecture, navigation, design and layout** to predict how easy the Web site would be for users to navigate and find (**findability**) what they need.

- **Value:**

Was the page worth visiting? Does the site offer anything informative, unique, or insightful? If the Web site scores high in its **usability**, the chances of the Web site being accepted and used productively are good (Stahl, 1987). Recent studies have found that Web sites low in usability are impeding consumers' performance and satisfaction when shopping online (Chiger, 1997; Nielsen, 1998; Machlis, 1999) According to ISO 9241-11 (1992) usability is defined as the “extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use”. **Perceived value:** The value of a system to an organization is based not merely on the amount

of information it provides, but also on whether the receiver (i.e., user) **sees value in the information provided**. (Gustin et al., 1997; Sarkis and Sundarraj, 2000). **feed back tools from clients, contact links, easy access to publisher**.

Learning capability: For many potential customers, using Web technology is a new experience. Also, providing **interactive learning tools** is necessary since consumers need to develop and apply their abilities through exploratory behaviour. Learning capability is directly related to Web site success.

Additional **value-added services** that may range from consulting and training to translation to “EDI-to-FAX” services to complete EDI-integrated business systems.

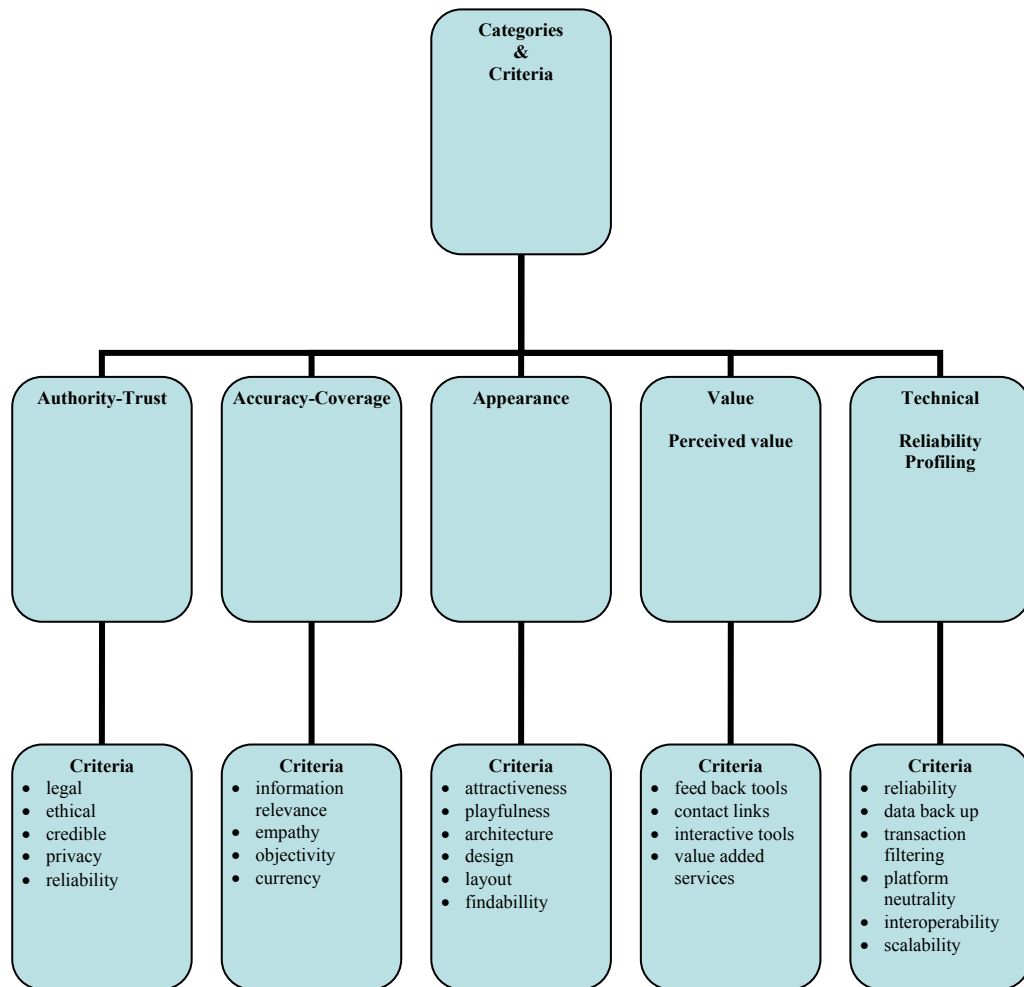
- **Technical:**

The **reliability** of the system to keep operating and not break down, for example public Internet web systems may be less reliable than hard-wired EDI based systems. Also, some services offer, **data backup** and **recovery services**.

Transaction filtering (**profiling**) options so you only receive solicitations in which you are interested. **Platform neutrality and interoperability**: The architecture of the systems must be platform independent.

**Scalability**: The performance system must scale well with business size (Gustin et al., 1997; Sarkis and Sundarraj, 2000).

## Framework structure



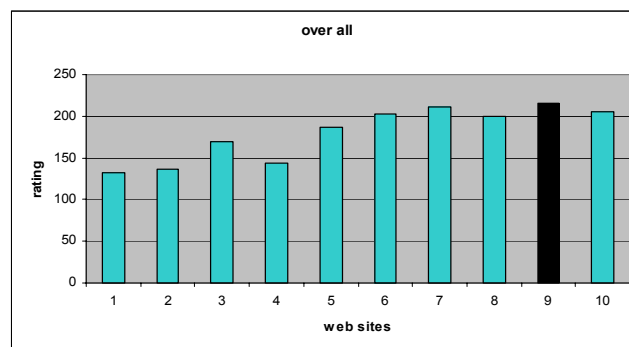
The selection list of 10 Web Sites

	<b>Proxy servers Web Sites</b>
1	<a href="http://www.00unblock.info/">http://www.00unblock.info/</a>
2	<a href="http://www.aquaproxy.net/">http://www.aquaproxy.net/</a>
3	<a href="http://virtual-browser.25u.com/">http://virtual-browser.25u.com/</a>
4	<a href="http://www.my-pornblocker.net/?gclid=CI3NrdK7mqECFZWAzAod4RDV4A">http://www.my-pornblocker.net/?gclid=CI3NrdK7mqECFZWAzAod4RDV4A</a>
5	<a href="http://www.profinfotech.com/softswitch.htm?gclid=CJP6uYS8mqECFQ89ZgodKyMR-A">http://www.profinfotech.com/softswitch.htm?gclid=CJP6uYS8mqECFQ89ZgodKyMR-A</a>
6	<a href="http://www.discovervirtualization.com/microsite/0,297132,sid191_mid221,00.html?CMP=KNC-Google&amp;int=off&amp;Offer=sy_lp07132009GOOGOTHR_Gsid191DellMS">http://www.discovervirtualization.com/microsite/0,297132,sid191_mid221,00.html?CMP=KNC-Google&amp;int=off&amp;Offer=sy_lp07132009GOOGOTHR_Gsid191DellMS</a>
7	<a href="http://searchstorage.techtarget.co.uk/topics/0,295493,sid181_tax308670,00.html?CMP=KNC-Google&amp;pre=off&amp;int=off&amp;Offer=sy_lp03052010GOOGOTHR_Gsid181data domainTIC&amp;gclid=CODW28C8mqECFQIeZwodHBpI-g">http://searchstorage.techtarget.co.uk/topics/0,295493,sid181_tax308670,00.html?CMP=KNC-Google&amp;pre=off&amp;int=off&amp;Offer=sy_lp03052010GOOGOTHR_Gsid181data domainTIC&amp;gclid=CODW28C8mqECFQIeZwodHBpI-g</a>
8	<a href="http://www.bytemobile.com/products-applications/osn-content-filtering-overview.html?gclid=CN3tlti8mqECFQYSzAodh3cl4g">http://www.bytemobile.com/products-applications/osn-content-filtering-overview.html?gclid=CN3tlti8mqECFQYSzAodh3cl4g</a>
9	<a href="http://www.wowvpn.net/?gclid=COLmpu-8mqECFYaRzAod7Qc_7A">http://www.wowvpn.net/?gclid=COLmpu-8mqECFYaRzAod7Qc_7A</a>
10	<a href="http://www.aconcaguait.com/explorerproxygen2008.php">http://www.aconcaguait.com/explorerproxygen2008.php</a>

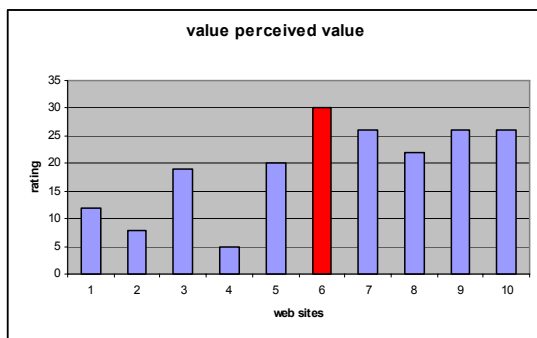
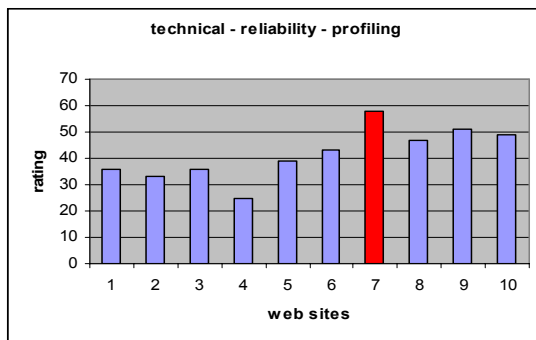
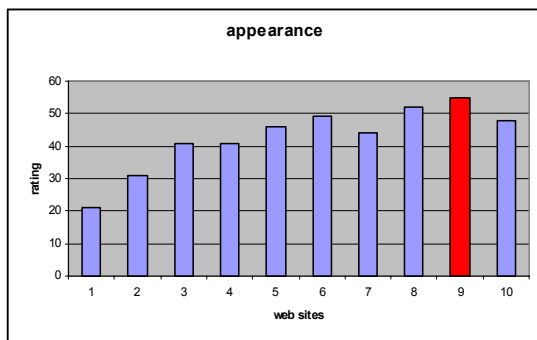
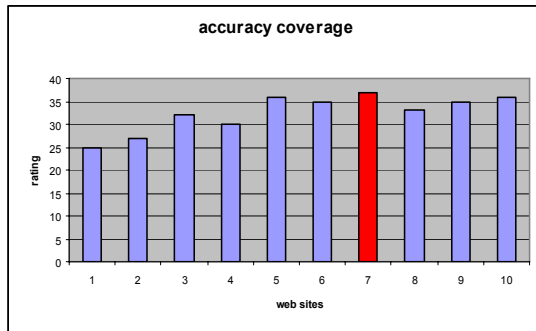
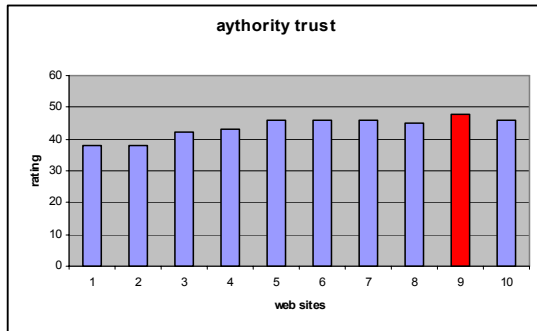


Measurements in excel form

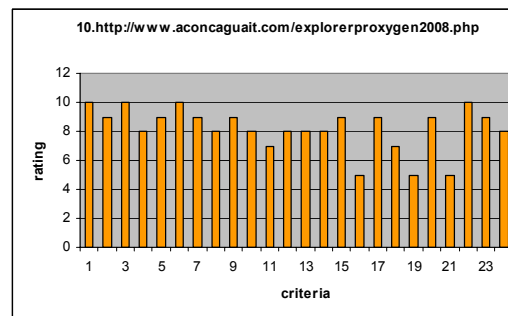
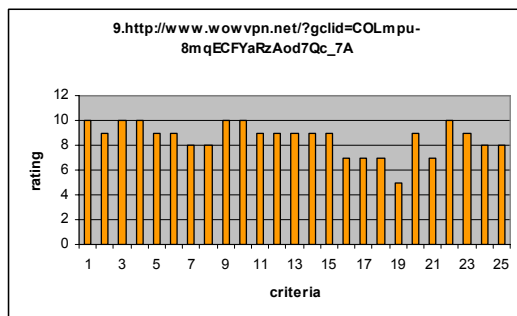
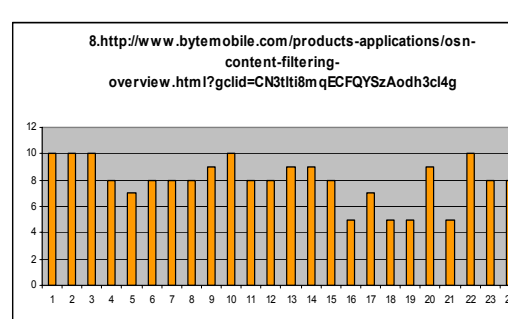
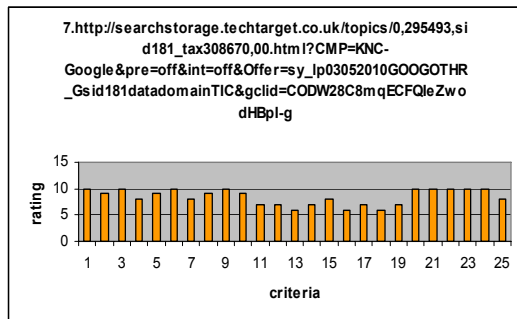
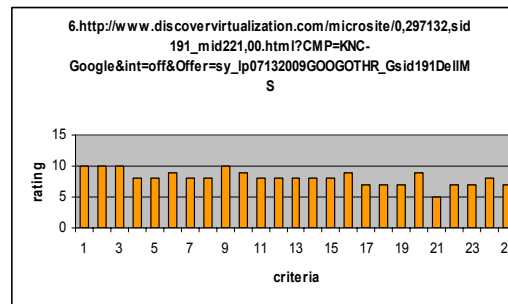
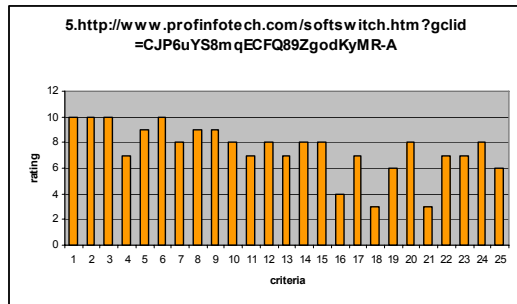
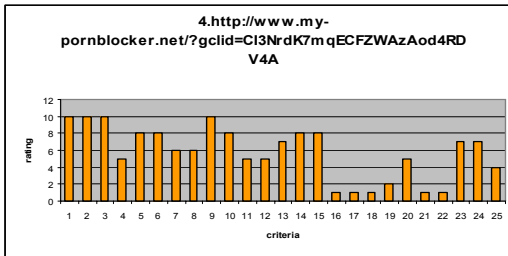
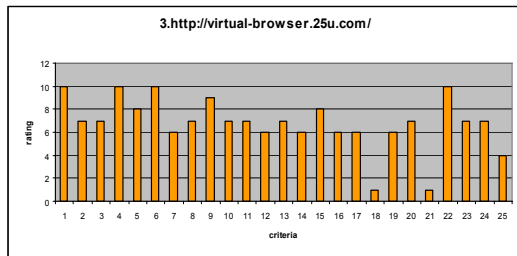
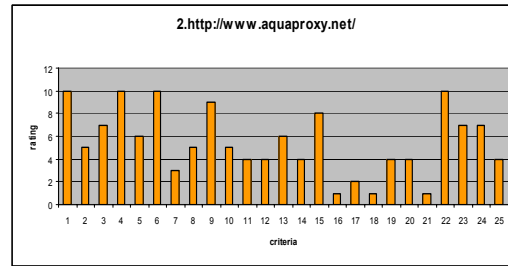
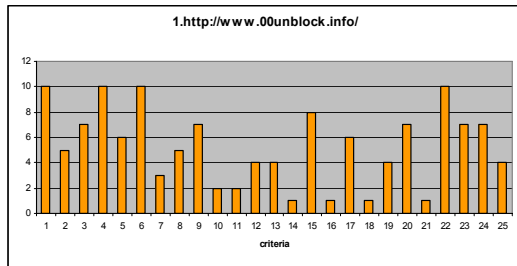
		Proxy servers Web Sites									
categories	criteria	1	2	3	4	5	6	7	8	9	10
<b>Authority-Trust</b>	legal	10	10	10	10	10	10	10	10	10	10
	ethical	5	5	7	10	10	10	9	10	9	9
	credible	7	7	7	10	10	10	10	10	10	10
	privacy	10	10	10	5	7	8	8	8	10	8
	reliability	6	6	8	8	9	8	9	7	9	9
	score	<b>38</b>	<b>38</b>	<b>42</b>	<b>43</b>	<b>46</b>	<b>46</b>	<b>46</b>	<b>45</b>	<b>48</b>	<b>46</b>
<b>Accuracy-Coverage</b>	information relevance	10	10	10	8	10	9	10	8	9	10
	empathy	3	3	6	6	8	8	8	8	8	9
	objectivity	5	5	7	6	9	8	9	8	8	8
	currency	7	9	9	10	9	10	10	9	10	9
	score	<b>25</b>	<b>27</b>	<b>32</b>	<b>30</b>	<b>36</b>	<b>35</b>	<b>37</b>	<b>33</b>	<b>35</b>	<b>36</b>
<b>Appearance</b>	attractiveness	2	5	7	8	8	9	9	10	10	8
	playfulness	2	4	7	5	7	8	7	8	9	7
	architecture	4	4	6	5	8	8	7	8	9	8
	design	4	6	7	7	7	8	6	9	9	8
	layout	1	4	6	8	8	8	7	9	9	8
	findability	8	8	8	8	8	8	8	8	9	9
	score	<b>21</b>	<b>31</b>	<b>41</b>	<b>41</b>	<b>46</b>	<b>49</b>	<b>44</b>	<b>52</b>	<b>55</b>	<b>48</b>
<b>Value-Perceived value</b>	feed back tools	1	1	6	1	4	9	6	5	7	5
	contact lists	6	2	6	1	7	7	7	7	7	9
	interactive tools	1	1	1	1	3	7	6	5	7	7
	value added services	4	4	6	2	6	7	7	5	5	5
	score	<b>12</b>	<b>8</b>	<b>19</b>	<b>5</b>	<b>20</b>	<b>30</b>	<b>26</b>	<b>22</b>	<b>26</b>	<b>26</b>
<b>Technical-Reliability Profiling</b>	reliability	7	4	7	5	8	9	10	9	9	9
	data back up	1	1	1	1	3	5	10	5	7	5
	transaction filtering	10	10	10	1	7	7	10	10	10	10
	platform neutrality	7	7	7	7	7	7	10	8	9	9
	interoperability	7	7	7	7	8	8	10	8	8	8
	scalability	4	4	4	4	6	7	8	7	8	8
	score	<b>36</b>	<b>33</b>	<b>36</b>	<b>25</b>	<b>39</b>	<b>43</b>	<b>58</b>	<b>47</b>	<b>51</b>	<b>49</b>
<b>TOTAL SCORE</b>		<b>132</b>	<b>137</b>	<b>170</b>	<b>144</b>	<b>187</b>	<b>203</b>	<b>211</b>	<b>199</b>	<b>215</b>	<b>205</b>



Graph analysis by category



Graph analysis by site / criterion



## **Conclusions**

It is quite clear that web proxying is a relatively new activity, there fore not very fine-crafted job has been done on the web sites.

In addition a large scale of use and implementations in software and hardware complicates the findings.

Comparing the categories:

Depicting the overall graph we can observe 2 “teams” of web sites, 1-4 and 5-10, that can be analysed as the “poor” and the “rich”. The “poor” group has equal ratings with the “rich” at the first category but loses the rest. Never the less the poor team has more hits in traffic stats ([http://www.proxy4free.com/list/webproxy\\_rating1.html](http://www.proxy4free.com/list/webproxy_rating1.html) ) but the users are staying less there, so probably a further research in target groups that visiting the web servers is needed. Probably these users need something light and less complicate in structure (faster in web speed language) so the evaluation criteria should be difenterent. The traffic stats were not measured in the framework as a criterion because of the lack of authenticity.

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