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Website Link Shortener

Aeesha Sdeek Shaheen¹, Najla Matti Isaac²

¹Computer Science Department, College of Computer Science and Mathematics, University of Mosul, Mosul, Iraq.

²Branch of Basic Sciences, College of Agriculture and Forestry, University of Mosul, Mosul, Iraq.

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ABSTRACT

Among the problems that are largely faced by Internet users, are long web page URLs. URL helps visitors to find the site and Google knows the website's pages. One of The URL parts of HTTPS (Hypertext Transfer Protocol Secure) is to encrypt any information entered on the page, like passwords, and credit card information, to protect website visitors and the site rank better on Google .and the need to add specific campaign parameters and tracking codes as extensions to those links, URLs keep getting longer. Long links eat up character count, cost more, and look old-fashioned and spammy to the end-user. The balance between benefits and potential issues, the subsequent difficulty in transferring or rewriting them, and the many attempts to rewrite them due to the many errors that the user makes while writing them because most of them are random symbols that are difficult to memorize, which causes a lot of inconvenience to the user, we work on solving these problems by designing a special site that will provide a solution by the design of a URL shortening service. This type of service takes a URL and produces a shorter link. A shorter URL will redirect the user to their original URL. Apart from saving space, this is also useful to embed this short link on Master Card or share it on social media, as well as many tricks cybercriminals have by using URLs, which can be avoided by using links generated using URLs. Link shortening service.

1. Introduction

An URL shortener is a website that shrinks the length of the URL (Uniform Resource Locator). Minimizing the web page address into something is the idea of a URL shortener that is easier to track and remember. There are many URL shorteners on the market today, including Bit.ly, Google, and Tinyurl.com.

The process of accessing the information on the Internet requires the existence of a system, method, and computer program to provide the necessary link to access information located

remotely in a network of computers interconnected. After logging in and registering on this link, a shortened link associated with the registered URL will be selected. This URL and the shortened link associated with it are then recorded in a database. When a shortened link request is received, the log database is searched for a linked URL. If the shortcut link is found to be associated with a URL, the URL will be fetched, otherwise, an error message will be returned. [6] [10]

Corresponding author:

E-mail addresses: aeeshashaheen_1965@uomosul.edu.iq

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The problem is that cybercriminals can use many different tricks by using URLs, which makes us believe that we are visiting a legitimate site when in fact we are visiting a different site that belongs to them and this site may be designed perhaps to steal important information or attack the browser and infect the computer with a bug or virus. [12] [11]

2. Understanding URLs:

To access a particular website, there must be a URL that refers to the address of that website. A URL is a term that refers to the address of a website, such as <http://www.abcd.com>. A URL is a name typed to visit a website or web page. The role played by the browser after entering the link to it, is that the browser takes the link and turns it into an IP address, and this address is the host where the website is located on the network. URL, can be connected to the site and then to the home page or any page according to the address in the URL, the page will send to the browser, to display it. A URL can be defined as an address consisting of three parts. The first part is the protocol, which provides the connection with the internet like HTTP or HTTPS the s for encrypted communication. The second part is the domain or the website we are going to. The third part is the name of the page that will visit within the website. Below is an example of a URL:

https://www.microsoft.com/en/microsoft-365/business/compare-all-microsoft-365-business-products?icid=mscom_marcom_CPW2a_M365fo_rBusiness_&activetab=tab_%3Aprimaryr2_&market=iq

when look to above URL see that is an encrypted connection because it begins with HTTPS, which indicates it. The next part, www.microsoft.com, is the website that we want to visit. Finally, the last part is anything after the slash that indicates the page of the website we want to visit. The previous example indicates that we want to go to the Microsoft website and then be directed to the Microsoft 365 Business so <http://www.microsoft.com> send us to websites that they control.[10]

3. URL Requirements:

Let's put this up into points:

Functional Requirements

Nonfunctional requirements.

For the **Functional Requirements:**

We want the user to be able to:

input their original URL and get a shorter and unique link. When accessing the shortened link, the user is redirected to the original link. The shortened link must be as short as possible, which makes sense since this is a URL shortened service. the shortened link must be human-readable. So, in case the user is manually typing it, there's less room for errors. All links will expire after two years of inactivity, so the shortened URL can be reused.[3][7]

The original and shortened URLs will be stored for four years. We're expecting the creation of 400 million new shortened URLs per month. And we're expecting 200 redirection requests for shortened URLs per month.

For **the Non-Functional Requirements:**

The focus on response time and availability. Now the shortened links must be random, these must be unique sizing for capacity.

URL Shortener parts:

Part one- how to link shorteners work:

A URL shortener is a service that converts long links into short, easy-to-use links. With this service, it becomes easy for users to connect to long or complex URLs through available connections, such as email, as well as when the link length or number of characters is specified as in the Twitter application or text messages. Examples of websites that provide short URL services are tinyurl.com, bit.ly, or goo.gl. But the use of these sites by the user may expose him to the risks of hacking and in case of using these sites and clicking on the shortened URL, it will not be safe, so you must first check the real destination of these shortened URLs before using them because

attackers can spread the shortened URLs to sites the web they control. [10]

One way of protection is to check the destination of the short link that this link will take us to. Many websites offer a service that allows us to copy and paste the short URL to know the real destination of the link. In addition, some URL shorteners like in the following example, if we have a bit.ly URL, and when we add a "+" to the end of the URL to find out the real destination of the link:

<http://bit.ly/10hVtvV+>

Part two - pros and cons of shortening links:

The major pros are:

These are so easy I was able to create it a second then copy the short link and use it pretty much wherever I want. They're trackable many of these services if we purchase the upgraded ones or even with some of the free plans will allow us to see exactly where the traffic's coming from how much traffic we get and all that kind of stuff that'll help us to find patterns of behavior and determine what audience wants (and doesn't want). By tracking the success of links, a business can understand what its audience is engaging with and adjust its strategies accordingly.[10]

they're free well mostly at least some of them if we want to get the advanced stuff costs a little bit of money but for the most part, link shorteners are free.

They Lead to a Higher Click-Through Rate: People are used to seeing shortened links on social media. Due to this, using shortened links will increase the click-through rate. It's one of the simplest changes that can make a posting strategy increase its effectiveness. [1][4]

There are some major cons:

First of all, when we create a link using a service like Bitly or TinyURL we do not own the link because we don't own the domain name so if we get a bunch of links out there and they decide to change their program or algorithm or terms the links now are canceled. That if we are using our domain affiliate, we can now have links on that

site as many as we want and in addition to actually owning links also can change them.

the last con is that some of these link shorteners can be quite expensive to get the tools that we need to be able to run a successful affiliate business and if we look at the links for Amazon alone, we could see they're getting millions and millions of visitors a month with their link shortener which means the affiliates are not getting the power of the links they're using even though they're doing the work to build them up.[2]

Part three - the best way to shorten links:

The URL shortener is instead of having such a long link it's going shorten it so the ending of it has with code so this code is going to be in five letter alphabetical code and that code is going represent one URL so when I copied this it should take me to the same web page it redirects us to the same page. we're going to have two different cases:

In one case user could send us a long URL and we would send it back a shortened link of the URL. the second condition is when the user gives us one of the short URLs then the short URL is to redirect them to the long URL which that short URL corresponds to.[8]

the first condition here is user sends us a long URL the database holds the values of the short URLs and the long URLs, then get a long URL we're going to check for check does the long URL already exist and if it already exists we're just going give the shortened version of it back to the user but it does not exist we did create a new code by picking five random letters and we're going to check if the five random letters were already used if those five random letters they're not already used, in that case, that is going to be our new shortened code, for example, call it STXYZ and STXYZ is correspond to whatever the long URL the user gave us, now we have a certain log URL stored inside of the database and one more thing we're going return this to the user.

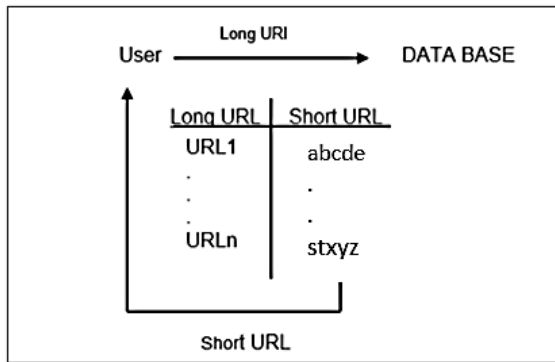


Figure (1) First Case Long URL to Short URL

The second condition is if the user is given STXYZ then we must redirect the user to whatever URL that represents. So, in our database, we're going to search in shortlist if the STXYZ in the shortlist that means we have one of the codes is STXYZ exists in the shortlist, and since it exists, we're going to its long URL so this is a long URL of STXYZ we're going to redirect the user to whatever page the long URL represents.

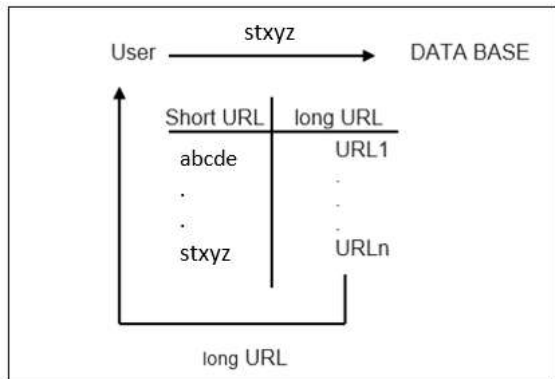


Figure (2) second Case Short URL to Long URL

now we're going to integrate our database MySQL outcome database with our home function we had two methods so if it is a post method the first thing, we're going to receive the data from our HTML page form as in figure (3)

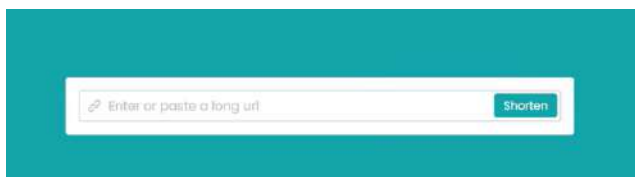


Figure (3) home page

Then we received the long URL from the user like the figure (4)



Figure (4) Long URL

After receiving the data we look for the long URL in the long URL list, if it is the first time to enter the long URL into the database we get a message that the URL does not exist in the database and the URL is not found, the URL does not exist so we need to create short URL and we have a function called shorten URL this function just return a random string of five characters to create our new URL(short URL), then keeping the long URL and the short URL by performing a query to save new URL by adding it to the short URL list as figure (5).

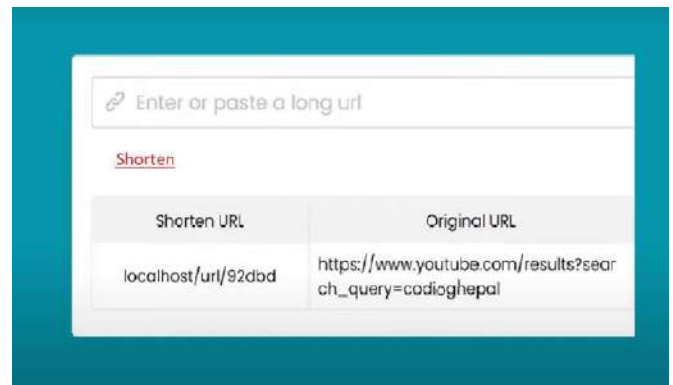


Figure (5) creates a short link

but if not the first time we looking for the long URL in long URL list if the same value is there the URL received and the short URL is the short URL make our changes permanent so at the end of this we're just going to end up returning our short URL all right so let's actually just create our shorten URL function over here so before we do that we want to import strings the string may be pick a total of five letters and could be more than five letters if we want it to have 10 letters we could make it 10 or forth we just make it five, that means random function give us five random letters to be our short URL variable and then check if the short URL list has the same random string in this case means that we do not want to

use this combination of letters since this combination of letters already exists then go back to the beginning and perform the same steps again come up with five more random variables and

we're going to do this until we come up with some sort of combination which is not already inside of our database, that's going to be our shortened URL.

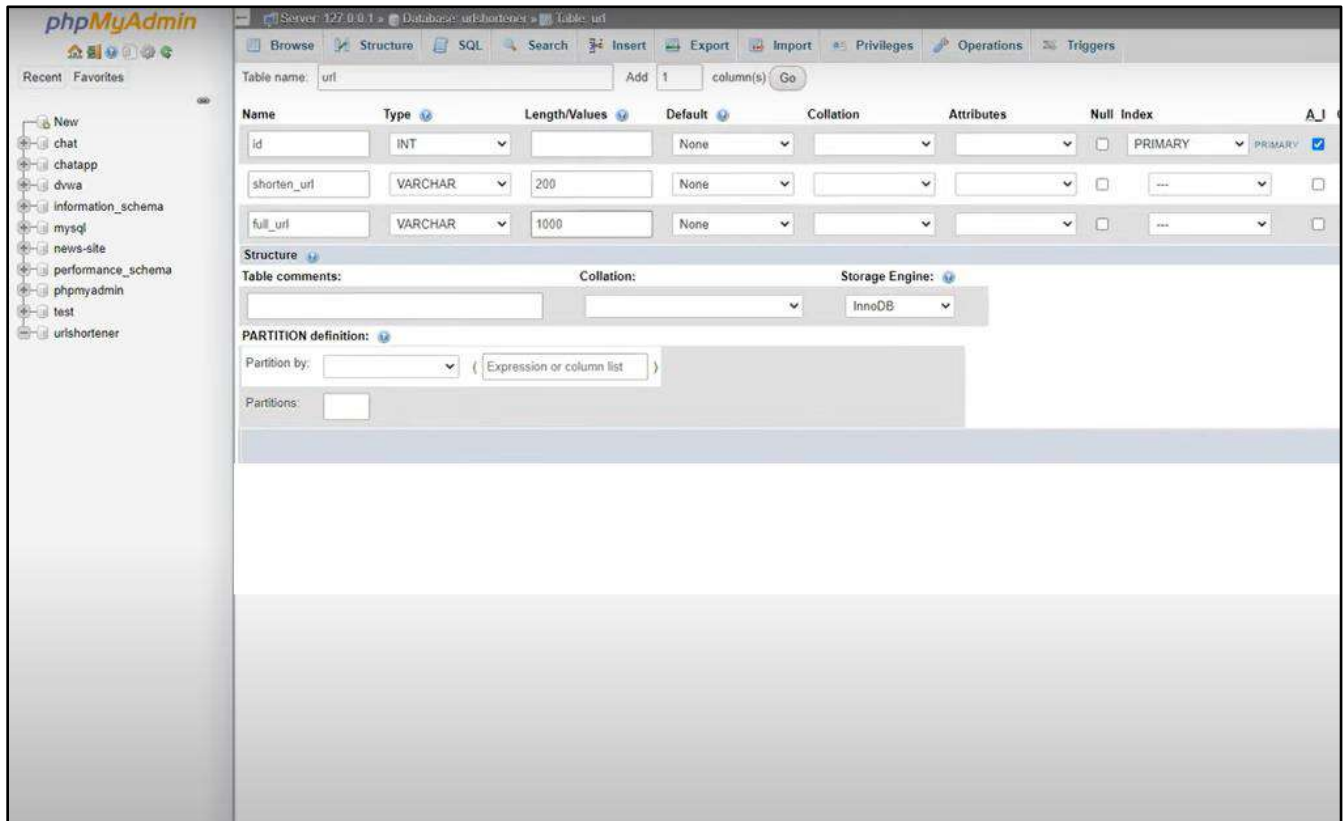


Figure (6) MySQL Database

But if the URL already exists inside of our database we return the short value of it, which already exists and we did not create a new instance of it, and the HTML file over here is going to be used to display the short URL when we press this short URL takes us back to the same page that is denoted by the long URL.

4. Conclusion

There is a lot of fallacy and misunderstanding among many people in common saying that link shortening can hinder site SEO. This is a misconception, but it also provides an opportunity to gain an advantage over competitors as this allows shortening links and maintaining our URL structures Simple, relevant and memorable Three points can use in the future to improve the SEO with link shorteners are to:

1. URLs must always match page titles.

2. Unnecessary words and characters "Stop" must be removed.
3. Mark links with keywords and memorable words

Using URL shorteners once we copy the URL and paste it into the text box, the URL shortener will launch automatically and the title and image will be attached if desired. Moreover, Analytical Tracking will start immediately.

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