

# Address Geocoding Options

## 1 Introduction

Some organizations have the need for a web application that can translate street addresses into latitude/longitude coordinates. Ideally, the web application could process addresses in bulk, either supplied from an Excel spreadsheet or from an enterprise data source such as a relational database; and output would be either in spreadsheet format or inserted back into a database.

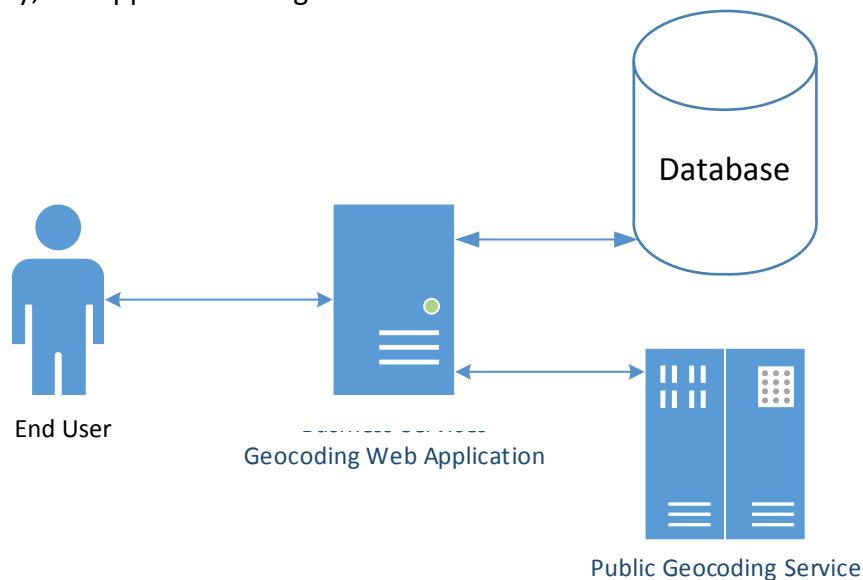
## 2 Solutions

### 2.1 Free public web-based services

There are dozens of web-based geocoder solutions – many of them are free to use – that accept addresses in spreadsheet format and output spreadsheets with the proper coordinates inserted for each address. Most of them have the ability to accept non-standardized addresses and tolerate typos and other misspellings; however the relative performance of each will differ depending on the data source and the quality of the underlying geocoding software.

The missing functionality in these solutions is a linkage to a local enterprise data source such as a relational database system or data warehouse.

To provide such functionality, one of the free geocoding services could be combined with a custom-built web application by calling the geocoding service's Application Programming Interface (API) from the custom application. Though the specific requirements of such an application may vary, the application's high-level architecture would look like this:

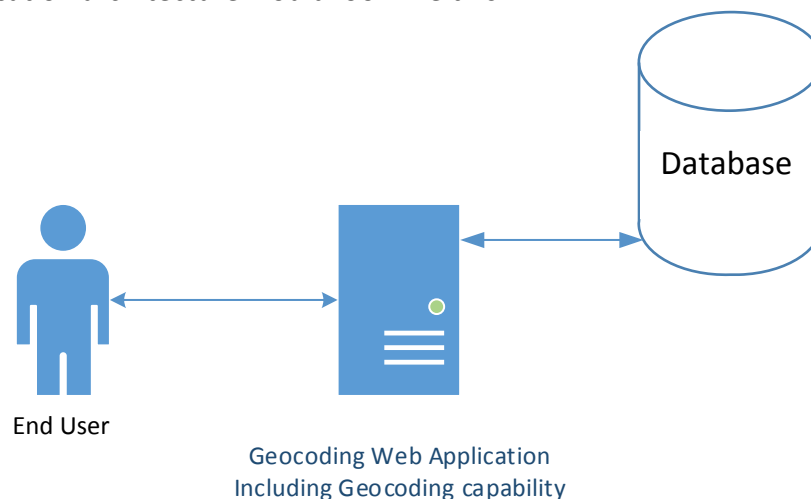


## 2.2 Paid web-based services

One possible problem with using a free public web-based service is that the addresses that are being geocoded must be transmitted to the third-party service, and the service would be under no contractual obligation to keep the addresses private (though the service may have its own privacy policies in its “Terms of Service”). This could potentially violate privacy policies or laws depending on the nature of the address data, even if no additional data is transmitted to the third-party. If this is a concern, one possible way to address the concern would be to utilize a fee-based service instead of a free service, in which case there may be an opportunity to enter in to an agreement with the service provider that would meet any necessary privacy-related obligations.

## 2.3 Private server-based solutions

Another way to address the privacy concern would be to purchase and deploy a server-based geocoding solution in-house, instead of utilizing a third-party. A server-based solution could be licensed from a software vendor or developed in-house by utilizing open source geocoding software. The application architecture would look like this:



## 2.4 Relative advantages and disadvantages of each approach

Solution	Advantages	Disadvantages
Public web-based service with no additional software	<ul style="list-style-type: none"> <li>Zero cost</li> <li>Easy to setup</li> <li>Geocoding data is kept up-to-date by third-party</li> <li>Choice of a variety of geocoding services</li> </ul>	<ul style="list-style-type: none"> <li>No automated linkage to enterprise data source</li> <li>Addresses are shared with third-party</li> </ul>

Solution	Advantages	Disadvantages
Private for-fee web-based service with no additional software	<p>Easy to setup</p> <p>Only cost is the cost of the subscription service</p> <p>Geocoding data is kept up-to-date by third-party</p> <p>Choice of a variety of geocoding services</p>	<p>No automated linkage to enterprise data source</p> <p>Addresses are shared with third-party, but there may be an opportunity to sign an agreement which could include privacy terms</p>
Public/free or private/fee-based web-based service with custom-developed web application	<p>Custom-developed web application could automatically accept query parameters and draw data from local database system or data warehouse</p> <p>Geocoding data is kept up-to-date by third-party</p> <p>Choice of a variety of geocoding services as long as they offer an API</p> <p>Application could be developed incrementally (i.e., start with a small set of requirements, grow the application over time)</p>	<p>Detailed requirements and specifications for database interface would need to be developed; custom web application would need to be developed and maintained. Cost could range from \$5,000 - \$50,000 depending on requirements.</p> <p>Addresses are shared with third-party; with a pay service there may be an opportunity to sign an agreement which could include privacy terms</p>
Custom-developed web application that uses internal geocoder	Addresses are not shared with third-parties	<p>Commercial software would need to be procured and/or custom software using open-source geocoder would need to be developed, adding \$5,000 - \$25,000 to the cost of the custom web application as specified above.</p> <p>Quality of geocoding may not be as good as with a web-</p>

Solution	Advantages	Disadvantages
		based service; ability to switch geocoders would be limited.

### 3 Lists of Services and Data

Texas A&M maintains a list of services at:

<https://geoservices.tamu.edu/Services/Geocode/OtherGeocoders/>

This listing includes free web-based services, fee-based web-based services, and server-based solutions/data. In addition, the U.S. Census Bureau recently deployed a Geocoder service with a web browser-based interface and an API interested in matching addresses to geographic locations and entities containing those addresses

(<http://geocoding.geo.census.gov/geocoder/>). As a US government-operated service, the use of this service *may* have some advantages in terms of privacy issues, compared to the use of other free services.