Automating Wage Determination Compliance Review

Developed for Federal Government Service Contractors by Megaputer Intelligence

Background

Federal government service contractors are required to pay their employees at, or above, a minimum wage standard known as the "prevailing wage." The prevailing wage is determined by the Department of Labor, which created lists of prevailing wages for different job categories based on a given area, commonly specific to the counties of a US state. These lists for different areas are called "wage determinations." The purpose of wage determinations is to help reduce the ability of contractors to low-ball their proposals to the detriment of their own employees. In order for contractors to make sure they comply with relevant wage determinations for different bids, they can search SAM.gov, a database centralized from 10 different General Services Administration (GSA) websites.

A leading global life sciences company ("the Company") sought out Megaputer to automate the process of checking whether its employees were compensated at or above the prevailing wage for new bids and renewing contracts.

Challenge

Although the publicly available database on the SAM website has greatly improved the user-experience of searching for relevant wage determinations since early 2020, there are still unique challenges faced by larger contractors servicing government agencies.

The Company has more than 30 locations employing over 60,000 professionals. Some bids require the Company to search for dozens of wage determinations for a single bid, but these cannot be performed simultaneously with the current search tools available on the SAM website. After running each of their searches and downloading all the wage determinations to text files, the Company would copy over the necessary text into Microsoft Excel sheets to then be cross-referenced with its employee database. Once individual employees were identified as being paid below the prevailing wage standards, the total sum of the differences between employee wages and the prevailing wages was factored into the business cost for winning a new contract. The entire process is far too manual and consumes a lot of time.

The SAM wage determinations use its own system of job coding and titles. Part of the Company's continuous work is to maintain a mapping of job codes from its internal job codes and titles to those of the SAM database. Additionally, the Company's employee database was found to be incomplete or lacking accurate information as to what US counties the employees belong. This causes cost estimations to be less reliable and, more importantly, leaves the Company open to fines for non-compliance at City, County, and State levels. Non-compliance may also result in a 3-year debarment from future government contracts.

All of these challenges are not only encountered at the time of the bidding process for the Company, but also on the biennial anniversary date of any active contract. Thus, over time as the Company accumulates more and more government contracts, the time and resources involved with this business process of referencing new or updated wage determinations may increase greatly in a short span of time.

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Solution

Megaputer Intelligence developed a solution for automating the wage determination process with the help of its proprietary data and text analysis software, PolyAnalyst™. While collaborating with the Company's Compensation Specialist, additional custom features were developed to reduce the need for visiting the SAM website, which enables the solution to process new information automatically for each new bid and run checks to verify the compliance of all active contracts.

The solution provided a more accessible and structured database with up-to-date wage determination information. The first step in developing this solution was the extraction of the entire SAM database for wage determinations that apply to the Service Contract Act (SCA). In February 2022, there were 887 wage determinations extracted into plain text and fed to PolyAnalyst for data preprocessing and analysis. The raw data was parsed in stages, first by wage determinations, then by job categories and job titles. This process conveniently maintained all associated attributes of these given areas, including the revision numbers, last revision dates, and relevant executive orders that may apply. The resulting database could be easily filtered, searched, or explored via a web-based dashboard or the PolyAnalyst API.

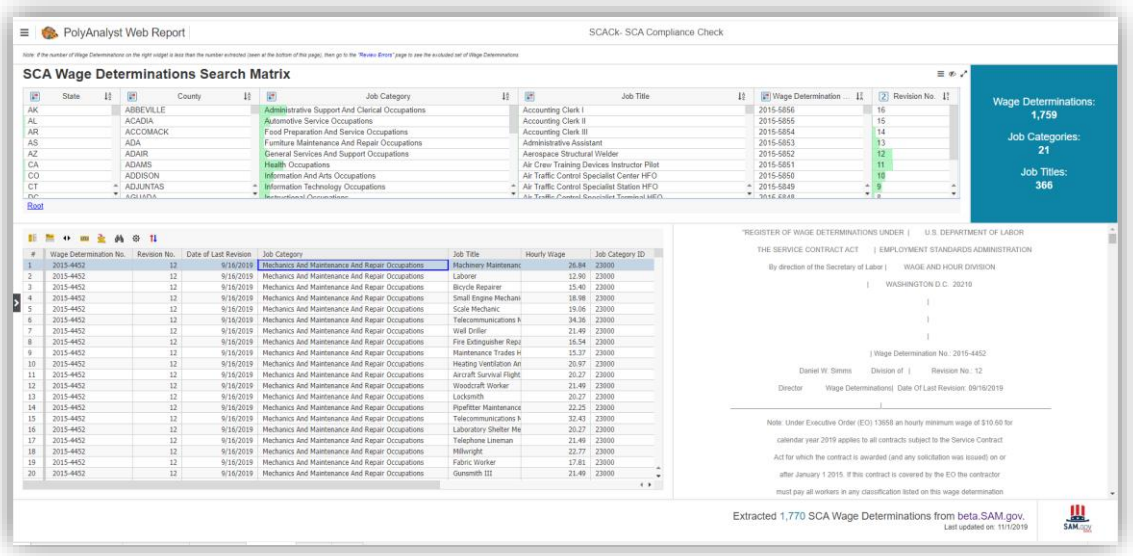

Figure 1: Sample web-based dashboard for filtering SCA wage determinations.

Once the database of wage determinations was prepared and accessible, Megaputer designed an integrated model for preprocessing the client's employee database. This model connects to the employee database and audits the data for abnormalities, such as incorrect formats and missing or inaccurate location information. The majority of missing values are imputed by inferential data associated with the employee using external sources, such as GIS repositories of US zip codes, cities, counties, and states. After the data cleansing is complete, any remaining employees with missing essential information are reported to a designated HR associate to rectify the identified issues.

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One of the biggest problems, and most common with other companies, is the lack of mappings from internal job codes and titles to those of the SAM database. Depicted in Figure 2 is a word cloud of the most prevalent job titles that are missing a SAM job code. This display of job titles enables an HR associate to prioritize their work on mapping the Company's job codes, thereby improving the comprehensiveness of the solution.

On Left: Figure 2: Word cloud of unmapped employee job titles

A built-in scheduler module of PolyAnalyst was enabled to provide the Company with updates about when, and if, any relevant employees fell below the prevailing wage. Relevant employees can be defined as those employees who are associated with an active or proposed government contract. The notification recommends they open a customized web report dashboard (see Figure 3 below), allowing the user to navigate the results for active contracts. This same dashboard can be updated to run the analysis on a single batch or multiple batches of new bid projects by either manually selecting required wage determinations or uploading a list.

Figure 3: Non-compliance Cost Summary Report.

The solution utilized natural language processing (NLP) techniques in order to extract key information needed, including details about executive orders that take priority over any listed hourly rates within a wage determination. For example, EO 13658 stipulates (as seen below) "…an hourly minimum of $10.80 for calendar year 2020 applies to all contracts subject to the Service Contract Act as of January 1, 2015". PolyAnalyst subsequently looks for declarations of applicable executive orders, extracts the determination of the new minimum wage, and automatically applies it accordingly to the final calculations totaling the business cost for the Company.

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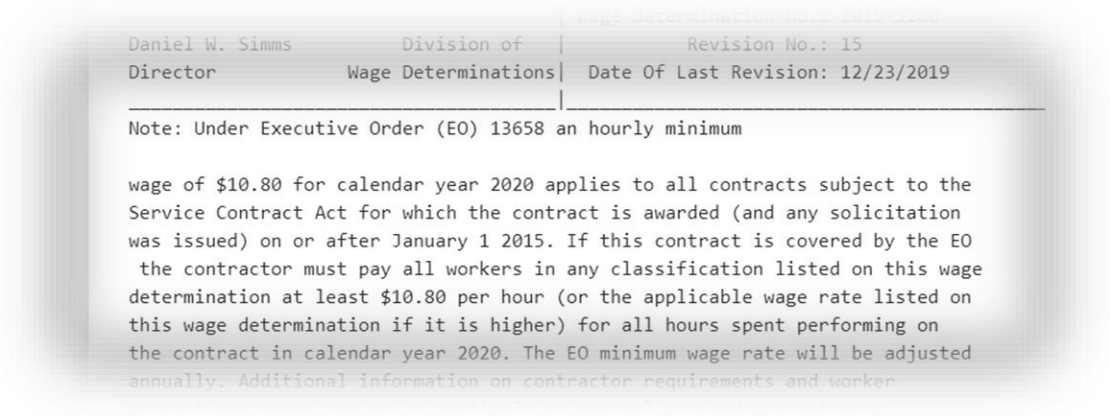

Figure 4: Screen-shot of SCA Wage Determination highlighting Executive Order details.

The final calculation is simple; get the total sum of the differences in wages for each employee between the prevailing wage and that of what employees are paid. The second consideration for the total business cost is that of minimum standards for fringe benefits. This information was outside the scope of the Company's desired automation, but plans have been formulated to summarize and factor in this information as well. For now, the Company is equipped with a preview pane to view the fringe benefit information without having to leave the solution environment (as seen in Figure 1).

Benefits

The automation of leveraging the SCA Wage determinations database on the SAM website provides a number of advantages. Listed below are a few of the key benefits the Company derives from the solution:

- **Reduced Risk –** By deploying an automated system, the task of checking for compliance minimizes the possibility for human error. It also shrinks the gap between researching and knowing when employee wages fall out of compliance, thereby reducing the risk of the Company being fined and debarred from future business.
- **Increased Efficiency –** The ability to integrate the employee database with an on-premise solution helped the Company maintain the highest level of efficiency and security. The solution cuts out unnecessary middleware and manual processes and replaces them with a single software solution, capable of integrating multiple systems and increasing the collaboration between departments.
- **Comprehensiveness –** In addition to checking the compliance of employees' salaries with prevailing wages, the solution helps identify inaccuracies within the employee database, which may affect other analysis. It automates the cost analysis of taking on a new service contract. And the solution provides the Company with tools to tackle the job code mapping challenge.
- **Scalable –** As the Company grows its business—either by employee count, number of service contracts, and as the Wage Determinations list grows and evolves—the solution can easily scale from a desktop application up to client-server architecture, and to big data processing needs in a cluster-based implementation.

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