

Unemployment Insurance Predictive Analytics Behavioral Modification for Integrity

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Integrity is an integral foundation for any system or process. The South Carolina Department of Employment and Workforce (DEW) is charged with the administration of Workforce Development, Employment Services, Labor Market Information and Unemployment Insurance programs. This includes the stewardship of collections for the Unemployment Insurance Trust Fund and disbursement of these funds in benefits to eligible claimants. The Department of Employment and Workforce's continued commitment to integrity has recently yielded deployment of modernized systems for both the tax and benefit programs. The systems have delivered many efficiencies for employers and citizens all with access through self-service portals. Attention of the Department of Employment and Workforce now will now be focused on the maintenance and development of policies and procedures, to further improve the integrity of both systems. This project focus will be on the new State Unemployment Insurance Tax System that was deployed in March 2017. Specifically, there was concentration on employers' behaviors and asking the questions:

1. Can the tax system data be used to analyze for predictive behaviors?
2. Can at-risk accounts be identified by their behavior?
3. Once identified, can efforts be made to reduce the at-risk behavior(s)?
4. What is the financial impact of these behaviors?

The Unemployment Insurance program is a federal and state partnership based upon federal law as prescribed in the Social Security Act. The Department of Labor is the federal oversight authority. Within the Department of Labor, the Employment and Training

Administration is charged with oversight of the Unemployment Insurance programs. Each state designs its own Unemployment Insurance program within the framework of federal requirements and sets forth its own benefit and tax structure. South Carolina's Department of Employment and Workforce administers the Tax and Benefit programs by authority of state law. The program is funded by employment taxes, both federally by an annual Federal Unemployment Tax Assessment, or through the state with quarterly State Unemployment Tax Assessments.

Reporting and fraud efforts in unemployment insurance tax and claim benefits programs have been focused on reactive models of "catch and recover". The concept is to capture and identify results after the fraud has been committed. This project's goal is to use data analysis of Unemployment Insurance Tax Accounts to proactively identify and engage at-risk behaviors. Fraud is a component of states' evaluation by the U.S. Department of Labor Unemployment Insurance program. Whether the acts of fraud are intentional or unintentional, the Department of Employment and Workforce needs to implement mechanisms such as system changes, policy, procedures, practices, education, motivation and demonstrations, in order to identify fraud. Thus, promoting behaviors that the state desire to have employers achieve the statutory requirement for proper wage reporting. Long term or repetitive negative behavior(s) impact Employer Tax Experience rates, the Unemployment Insurance Trust Fund solvency and accuracy of collections along with Labor Market Information statistical reporting.

This data driven exercise of analysis works within the South Carolina Department of Employment and Workforce's strategic plan for Employer Tax Service department efforts. The strategic planning process included both a mission and vision statement necessary to fulfill the

agency's mission. The effort of this project is to provide reporting integrity aligned with the vision statement to be seen "*as an efficient, transparent, customer-friendly*" agency with a mission to "*facilitate financial stability and economic prosperity for employers*" as fully stated in the DEPARTMENT OF EMPLOYMENT AND WORKFORCE STRATEGIC PLAN OVERVIEW as updated April 2015 (Appendix 1). As the Department of Employment and Workforce has set these declarations in motion, there will be implementation effort required from all agency units, departments, divisions and stakeholders to ensure a successful strategic plan for integrity.

The Department of Employment and Workforce currently has multiple reactive processes to identify when fraud is committed. Policy and procedures are established to recover these funds. The comparison between actual performance and desired performance helps to identify at-risk accounts and implement efforts through Policy & Procedures, practices, education, motivation or demonstrated behaviors that the state desires. This is done to encourage proper reporting and payments to prevent fraud, whether intentional or unintentional. This gap analysis will gather data from historical behavior results for employer accounts in the State Unemployment Insurance Tax System's data universe. This will require a manual method to analyze and identify accounts that display at risk behavior(s). Data points will include the State Unemployment Insurance data field of liable registered accounts, account status, report status, and tax liability (debit).

For implementation of the data analysis, The Department of Employment and Workforce's State Unemployment Insurance Tax System has established data dashboards and the flexibility to develop ad-hoc reports to further clarify the established behaviors of interest. The State Unemployment Insurance Tax System has a user acceptance environment that

mirrors the production region’s data. This region will provide support of predictive behaviors. The data collection goal is to identify long term behaviors with negative impacts. Long term will be defined as a liable active account’s last eight (8) completed calendar quarters of behavior and reporting. Only liable active accounts will be observed, due to the fact that non-liable and inactive accounts have no state Unemployment Insurance reporting liability. This data universe will allow behavior observation during the most recent period used in the account’s Tax Experience rate calculations. These data points are essential to identify and understand the impact to the Unemployment Insurance Trust Fund, Labor Market Information reports and collections of debt. The financial impact of wage report estimation is a result of the business rule formula to determine the gross estimated taxable wages by use of the last four (4) completed quarters of original wage reports received from the employer. The total of the four (4) quarter’s reported taxable wages divided by four (4) is used to establish the average taxable wages base. The average taxable wages amount is then multiplied by the account’s employer tax experience rate and then doubled to establish the collection debit until the original report is received by the Department.

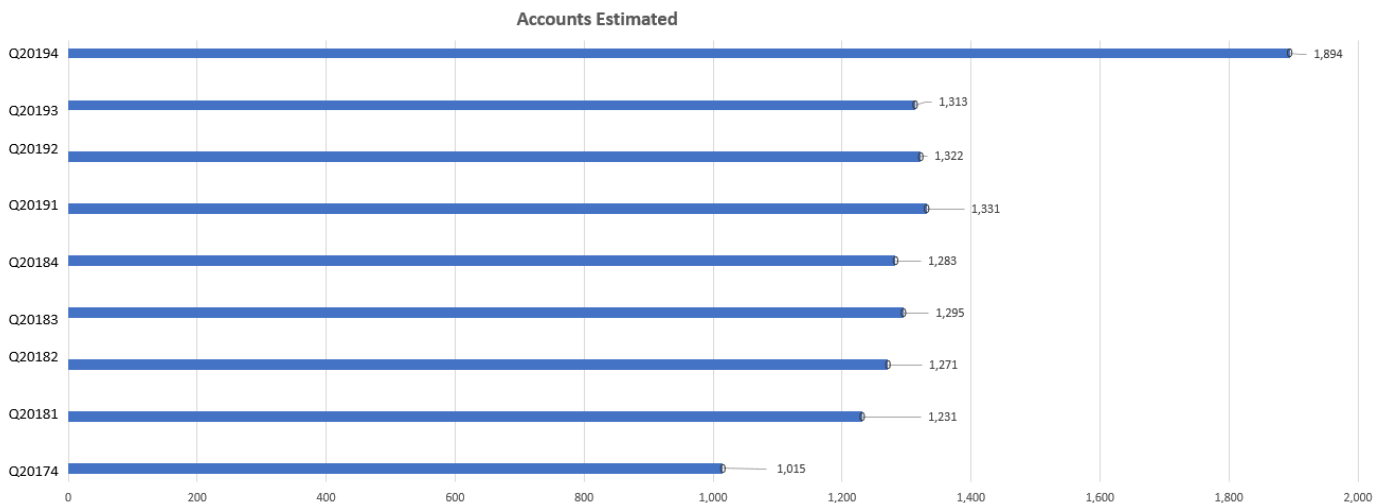
The data observed from established behaviors were as following:

| Stats | | | |
|---------------------|-----------------------|-------------------------|-----------------------|
| Employers By Status | Employers By Type | Employers By Employment | Accounts By User Type |
| Active: 122,313 | Contributory: 258,116 | Agriculture: 730 | Employers: 64,248 |
| Inactive: 123,357 | Reimbursable: 917 | Non-Profit: 1,876 | Agents: 1,968 |
| Cancelled: 11,727 | Reimbursable 2%: 195 | Government: 1,030 | Internal Staff: 378 |
| | | Other: 240,207 | |

The key data element in this region is the “Active” accounts of 122,313. From this element, a report was generated to provide specific identification of accounts as follows:

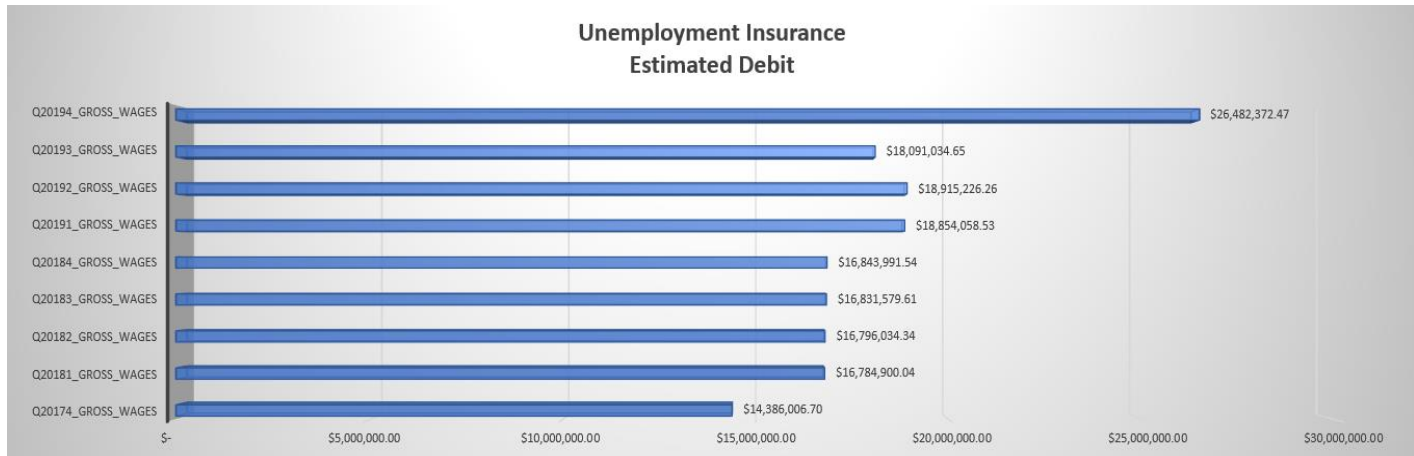
- ❑ Wage reports type with eight (8) consecutive quarters of zero and estimated.
- ❑ Active accounts with eight (8) consecutive quarters of estimated reports.
- ❑ Active accounts with eight (8) consecutive quarters with a combination of zero wages or estimated reports.
- ❑ Debit from eight (8) consecutive quarters combination of zero wages and/or estimated reports.

Finally, the following data chart shows the actual debit generated from established behaviors and the predicted behavior generated in the user acceptance testing environment for account’s behavior of non-compliance reporting:



Q20193 (3rd quarter 2019) is the last completed quarter with established behaviors for 1,313 accounts estimated with 8 quarters of Zero and/or Estimated reports. Q20194 (4th quarter 2019) is the predicted behavior of 1,894 estimations from adjustment to the processing dates in

the User Acceptance Testing environment to “time travel” for fourth quarter 2019 for estimated wage reporting.



Q20193 (3rd quarter 2019) is the last completed quarter with the behavior results of \$18,091,034.65 in debit liability from accounts with 8 quarters of Zero and/or Estimated reports. Q20194 (4th quarter 2019) is the predicted behavior resulting in \$26,482,372.47 in estimated debit from adjustment achieved through processing date changes in the User Acceptance Testing environment to “time travel” for fourth quarter 2019 estimated wage circulations.

This data drives the plan for behavioral change. This authority for a change in reporting is stated in **S.C. Code Ann. § 41-29-110** (Appendix 2). It authorizes the Department to “promulgate regulations necessary to carry out the provisions of Chapters 27 through 41 as it considers necessary or suitable to administer its duties and exercise its powers pursuant to the title.” This is further clarified with **S.C. Code Ann. Rags. 47-15** (Appendix 3) which states that

“each employing unit shall make such reports as are prescribed by the Department and shall comply with instructions pertaining to the contents and due date of any report form issued by the Department.”

Thus, the effort to prevent the negative behavior of non-compliant reporting can be handled by administratively inactivating accounts, once they are properly identified. This administrative inactivation can be automated to continue the prevention of non-compliance reporting moving forward. This will require business rules changes in the programming code of the State Unemployment Insurance Tax System. The current delinquent wage report process business rules are:

1. Accounts are mailed written notification of delinquent reports.
2. Automated calls are generated in support of delinquent Wage Report notifications.
3. The State Unemployment Insurance Tax System administratively and automatically estimate delinquent Wage Report as of:
 - a. March 8th
 - b. June 6th
 - c. September 6th
 - d. December 6th
4. Mailed collection notifications communicate the financial impact of the estimated Wage Report to each account.
5. Upon the 4th consecutive quarter of estimated wages, the State Unemployment Insurance Tax System automatically issues a “status” assignment workflow for the staff

to make contact with employers to collect the delinquent reports or update changes to the accounts status.

A team consisting of subject matter experts, management and system programmers interpreted and triaged the data. This was tracked with the Department of Employment and Workforce's internal application that created FootPrint ticket #2177. The option to make the behavioral change through automation was tracked with the software vendor's Problem Incident Resolution application with ticket #11311. This process provides the details to programmers for desired changes in the reporting behaviors of non-compliant accounts by means of administrative inactivation via business rule change with automation and continued systematic updating of account status moving forward. The cost of the business rule modifications fall under the general maintenance agreement and will not be associated with any additional cost.

The Department of Employment and Workforce following the established protocol for system changes proposed and approved business rule changes stated in PIR 11311 was as follows:

NEW --- After two (2) quarters, the State Unemployment Insurance Tax System should generate a status workflow assignment if at least one (1) quarter is estimated. After seven (7) quarters of any combined zero or estimated returns, a status assignment should be generated to determine proper reporting, obtain reports, get account status and inform employers of the Department of Employment and Workforce's automated process to inactivate after eight (8) consecutive quarters of Zero or Estimated wage reports.

This assignment workflow file is to run quarterly in the State Unemployment Insurance Tax System on:

- a. March 9th
- b. June 7th
- c. September 7th
- d. December 7th

NEW ---Policy and Procedures change by administrative authorization will take action after eight (8) quarters by the State Unemployment Insurance Tax System and will automatically inactivate accounts with any combination of Zero or Estimated returns. This rule should not be applied on accounts with an original report or Field Wage Report on file any time during the last eight (8) quarters. This inactivation job is to run quarterly in the State Unemployment Insurance Tax System and will automatically close accounts meeting the defined criteria as of:

- e. March 7th
- f. June 5th
- g. September 5th
- h. December 5th

This effort demonstrates the use of data analytics for integrity initiatives. The ability to take human behavior and quantify it in a manner to identify, take action and measure how modifications can strengthen and provide assurance for governance of South Carolina's Unemployment Insurance system, accurately reflects the reporting universe. Local work force boards and other Economic Development stakeholders utilize the Labor Market Information reports that is partially derived from the State Unemployment Insurance Tax System's data.

These reports influence where funds are utilized for training and other job creation efforts. The employer's behavior of non-compliance reporting was identified showing negative impact for employers of South Carolina. The behavior was proactively modified through system automation and business rule changes. This policy and procedural process change reduces the risk of employer compliance failure. The Department of Employment and Workforce will see further benefits from the reduction of resources in estimation and debit collection efforts and accuracy of the Trust Fund solvency and Labor Market Information data.

My recommendation is to further develop integrity initiatives through automation with the use of "big" data analysis. This project required time intensive manual extrapolation and analysis. The use of software with structured modules and the flexibility to develop new models would provide time reduction of efforts with quicker implementations. The potential to work with other States and interested stakeholders to develop a shared library of developing models and best practices can expand the system accuracy.

This project resulted on the identification of negative behaviors in Unemployment Insurance Tax. Further development of other negative and positive behavioral models should continue to ensure full utilization of the modernization efforts already undertaken of the Tax system. Unemployment Insurance historically had issues with fictitious employer fraud. This is when an individual or a group creates a company existing on paper, supported by use of false documentation that may include employee paystubs, W2s, quarterly tax reports and annual tax returns to give the appearance the company is legitimate. The individuals executing this type of fraud then files Unemployment Insurance benefit claims using the fictitious company name to

trigger benefits to be paid by the state. Another example is fraudulent employer fraud. This occurs when a legitimate company takes employees off the payroll and continues to employ them full-time. They pay the employee unreported cash wages for part of the hours they work. Employees then file for Unemployment benefits to supplement for full compensation of work performed. Fraudulent employer situations like this involve collusion and or coercion between the employer and the employees to file for unemployment insurance benefits. These and other models can be used in maximizing the ability to proactively change behaviors and schemes as early as possible, minimize investigation time, prevent fraud, adapt to evolving patterns using multiple models, automate processes to prevent time on manual efforts, focus efforts on priority cases, take data and make actionable business processes.

The Department of Employment and Workforce has also modernized the Unemployment Insurance benefit system and should develop models for claimant behaviors. Efforts should be made with data point's cross matching Tax, Benefits and Workforce systems to determine the best places to focus resources as funding changes are occurring for both programs requiring the need to be more efficient with work efforts.

In summary, this project produced the following answers to the original questions:

- 1) Can the tax system data be used to analyze for predictive behaviors? Yes. A pattern of behaviors were cross-matched to reveal negative behaviors that impacted Unemployment Insurance Taxes.
- 2) Can at-risk accounts be identified by their behavior? Yes. The patterned behaviors were associated with a universe of specific accounts and their individual behaviors.

- 3) Once identified, can efforts be made to reduce the at risk behavior(s)? Yes. The specific behaviors in this model can be influenced through a system automated process using new policy and procedures with business rule changes.
- 4) What is the financial impact of these behaviors? The State Unemployment Insurance Tax System's test environment provided the ability to "time travel" and show a positive financial impact by reductions of the debit for the fourth quarter 2019 in changing the negative behavior of non-reporting. In turn, employer tax experience rates for employers and Labor market Information data analysis yield higher accuracy for evaluation purposes. Further, historical data shows the negative behaviors financial impact of imprecise debit collections. The inaccuracy impacts Unemployment Insurance tax collections efforts for the Trust Fund, higher employer tax experience rates for employers and inaccurate data for Labor Market Information analysis.

Continued data analytics on a structured timeline can drive additional initiatives to ensure integrity across South Carolina's modernized Unemployment systems. These efforts should include benefits, employer services and additional Employer Tax Service models.

Misclassification and State Unemployment Tax Assessment (SUTA) dumping are of key interest to the Department of Labor (DOL). Analytic teams should be inclusive of subject matter experts and managers from the respective areas to determine potential in all areas of operation. There exists a robust universe of data points within the Department of Employment and Workforce's multiple systems. This can be compounded with access to additional data points from outside sources such as South Carolina's Revenue and Fiscal Affairs and Internal Revenue Service data sources. The National Association of State Workforce Agencies (NASWA) offers supportive

efforts to states through the national Unemployment Insurance Center of Excellence with an archive of best practices, workforce professional community message exchange platform and subject matter experts consulting services. These outside sources would strengthen the administration of the Unemployment Insurance system with improvements in the best interest of the public. The Department has approval for procurement of an analytical software. With the use of “machine learning” software, more data points can be utilized in the analysis of the growing data points.

Integrity is an evolution that involves large changes such as system modernizations and small changes of policy and procedures. The aggregate of these efforts will provide the success for both our vision and mission statements.

Acknowledgement is given for the contribution to this project from the staff members at the Department of Employment and Workforce and Sagitec. This effort is a conglomerate of many conversations, meeting, debates, exchanges of ideas and supportive individual intellect. For fear that I may miss someone, I will thank all my coworkers. These same people carry forward everyday with their continued excellence in the administration of the Unemployment Insurance program. Most impressive is their demonstrated integrity for the citizens of South Carolina.

APENDIX CHART

- 1) South Carolina State Library:

[https://dc.statelibrary.sc.gov/bitstream/handle/10827/20434/DEW Strategic Plan Overview 2015.pdf?sequence=1&isAllowed=y](https://dc.statelibrary.sc.gov/bitstream/handle/10827/20434/DEW_Strategic_Plan_Overview_2015.pdf?sequence=1&isAllowed=y)

- 2) **Mission Statement:** *To promote and support an effective, customer-driven workforce system that facilitates financial stability and economic prosperity for employers, individuals and communities.*
- 3) **Vision Statement:** *South Carolinians will view the South Carolina Department of Employment and Workforce as an efficient, transparent, customer-friendly partner in providing quality workforce solutions.*