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DATA ANALYTICS FOR NATIONAL PENSION SYSTEM OVERSIGHT REPORT INNOVATION WITH AI/ML TECHNIQUES

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ABSTRACT

Govt. of India, Ministry of Finance, Department of Expenditure have introduced a New Pension Scheme replacing the existing system with effect from 1.1.2004 and is applicable to all new entrants to Central Govt. service except to armed forces joining Govt. service on or after 1.1.2004. Newly joined NPS subscribers who don't have NPS account i,e. PRAN (Permanent Retirement Account Number)number, submit CSRF forms('Common Subscriber Registration Form') for the purpose of generation of PRAN number which is some unique number to maintain NPS account, all NPS related fillings, tax rebate, nominations, savings etc. Some newly joined NPS subscribers have their PRAN number already existing from before, they need to shift their PRAN number to the department, where newly joined with submission of 'Inter Sector Shifting Form' (subscriber shifting form). Our objective is to find the number of total NPS employee, joined within a certain month, certain quarter, how many PRAN numbers have been generated for these newly joined NPS subscribers, how many are yet pending to be generated, number of NPS employees whose PRAN have been generated within twenty (20) days and whose first NPS contribution started within time. Number of NPS employees whose nomination details, contact details are not available on NSDL CRA site, are to find out also. Time to time we have to download the CSV file, 'subscriber_list.csv' from NSDL CRA DDO-LOGIN, (DDO-Drawing and Disbursing Officer) to process all these NPS related data analytics, filtering and sorting of data to submit NPS oversight report on quarterly basis or when required to submit. The number of NPS employees submit ISS forms and shifted or pending to be shifted to this region, are to find out also. So here in this paper with the help of data analytics based on python code, executable on google collaborator platform, such analysis has been used to understand all these urgent insights.

Keywords: NPS, PRAN, ISS, NSDL, DDO-Login, Subscriber List, Python, Google Collaborator.

Introduction

Under the chairmanship of the financial advisor of Ministry/Department, Government has established the National Pension System Oversight Mechanism in 2019 for each ministry or department. The main objective was that the contribution of employees and Government is to be credited without delay. The guideline is to fix one Oversight Mechanism Meeting generally once in three months to review the progress. The Oversight Mechanism is to assure also timely remittance of employees under NPS and also reporting of grievances of employees covered under NPS. Ministry/Department has to formulate six monthly report also with NPS PRAN generation /nomination update, as an implementation of Rule 10 of the CCS (Implementation of NPS) Rules, 2021 for taking option form and family details. The purpose of analysis is to supply report regarding NPS oversight as and when needed, either quarterly basis or yearly or six monthly and also, as and when required basis. As data of total NPS joined and number of PRAN generation among that newly joined NPS employees are required on urgent basis, so the data analytics

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have been used to obtain all the necessary output for all types as well as to get clarification of the NPS oversight when analysis done on that executed data using downloaded data, obtained from NSDL CRA website and also comparing file with manual entry.

Literature Review

The study of types of information associated with the number of NPS joined to the region, to submit month wise, quarterly, six monthly and yearly NPS oversight report is the main and necessary purpose behind this data analysis and source of material are notes of professors and data-scientists as well as hands on training on python code analysis on google collaborator platform, study material collected from the course 'ADVANCED CERTIFICATION IN DATA SCIENCE AND AI, CODE IIT MADRAS, Digital skill academy's programme', organised by INTELLIPAAT .Other than this, the site NSDL CRA and NSDL CRA DDO log-in and you-tube video to get highlight of the process on how to register for DDO-LOG-IN first time for NSDL CRA to download list of subscriber updated as on that date of downloaded data, to check status of received applications for all types of authorisation and also to check status of grievances whether any. Moreover some idea related to study of NPS and Python data analysis in pandas data frame as mentioned as references.

Research Gap

Some research papers are there, based on NPS oversight, paper on rules, regulations, comparison of oversight between different countries, reviews on NPS oversight mechanism, but no such type of paper could be noticed based on data analytics to get output on number of total PRAN generation within a certain duration including month wise total of newly joined NPS employees. Also in this paper how many NPS employees joined with new PRAN generation and how many NPS employees with already existing PRAN and need to shift subscriber to new sector or region by submission of ISS or Inter Sector Subscriber Shifting Form, this also can be determined. How many nominations and family details are pending to be uploaded in NSDL-CRA, can be determined by data analysis of the updated csv file downloaded from NSDL CRA. Other necessary insights can be obtained also by filtering process for the purpose of preparation of oversight report as and when required basis. So this quantitative analysis is new with the help of data analysis after introduction of oversight report in regular basis.

Research Questions /Hypothesis/Objective of the Analysis

In this research, basically we wanted to determine the status of NPS data, mainly regarding pendency of PRAN generation, number of days elapsed between joining date of each NPS and activation of newly generated PRAN number .The PRAN generation within time is twenty days(20 days).The remittance is to be deducted from salary of each NPS subscriber without delay, in each month, starting from the month of PRAN generation and activation, with the compulsory savings account as TIRE-I, NPS deduction from salary through PFMS (Public Financial Management System), implemented by the Controller General of Accounts (CGA), Department of Expenditure, Ministry of Finance, Government of India. For NPS, joined with already existing PRAN number, PRAN account is to be shifted from the previous source employer to the new target one. The number of such type of newly joined NPS employees submitting ISS (Inter Sector Shifting Form) forms are to be obtained also, to check how many of them have been shifted to the current target region, as for these employees also, the process of NPS remittance can be started in the new sector, from salary only after successful subscriber shifting accordingly. Moreover whether there is any pendency in PRAN shifting, PRAN generation, IRA flag, contact details, nomination details, these also can be detected by analysis which is necessary for review in NPS oversight.

Method

Basically this paper is based on data analytics related with preparation of NPS oversight report. Two files are there to keep records, necessary to have sufficient information related to PRAN activation and associated details for the subscribers. One MS-EXCEL data file is dealt with incorporation of records of submission of forms by subscribers when they join to this region. Two types of subscriber registration forms are necessary there, one for new PRAN generation, CSRF form, 'Central subscriber registration form' and another form, necessary for those, who have already PRAN number generated from NSDL, but due to change of employment sector, have to make subscriber shifting to the new target region. For this purpose, the subscribers are to submit ISS 'Inter Sector Shifting Form'. The MS EXCEL file is related with both the type and analysis in csv format of this file is done accordingly to find the number of both submission depending on the necessary details of NPS subscribers, with respect to their name with unique PRAN number .This file is maintained with manual entry of records in MS-EXCEL file,

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consisting with data of, 'year', 'joining date', 'date of PRAN activation', 'types of form ', month of submission. All these records (except the date of PRAN activation, which is updated later on, for employees subjected to new PRAN generation, as in NSDL, this date can be available only after generation of PRAN or shifting of PRAN), are entered whenever any subscriber joins to this region of this department. The PRAN number along with date of PRAN activation are entered as soon as information regarding PRAN generation is obtained .For this file, analysis is subjected to year and month wise to get number of two types of forms as submitted by the subscribers (either CSRF or ISS), while joined to this region in this department .For the case of newly joined subscribers, PRAN number is to be generated later on by NSDL to store all the necessary details of the subscribers. For the case of newly joined subscribers, subscribers already have PRAN number, generated before, so for their case, shifting of subscriber is to be dealt with for necessary subscriber shifting from source region to current target region. Necessary insights can be obtained from Python data analysis year wise and month-name wise to have necessary insights with the information, whether any pendency with PRAN generation or subscriber shifting is there for any subscriber. This is in brief, description of first data file, in EXCEL format. The second data file can be obtained from NSDL CRA. Analysis with this file as available from NSDL CRA site, through DDO log-in, already registered before with DDO registration number, is also done with updated subscriber list for the purpose of having relevant insights associated with PRAN generation. depending on the necessary data to supply report for NPS oversight report, either quarterly or monthly or for the period as wanted for. Generally quarterly oversight is prepared to supply. Each time for the purpose of having updated records of PRAN generation, to open the site NSDL CRA, through DDO-LOG-IN, already registered before . After logged-in to this site, from 'views' menu, downloaded the csv file with updated subscriber list, to start the analysis. Formatted the column with PRAN number (permanent retirement account number) as numeric field, formatted the columns of 'date of joining', 'date of PRAN activation' to a suitable date format type, and formatted the column with phone number to numeric type. Then done the process of uploading of this file to content folder of google collaborator, for the purpose of analysis. After this, continued with necessary pre-processing for the compatibility of analysis in Python, with adequate codes such as 'data.info', 'data. shape', etc. and changed the date variable to date time format for compatible analysis. Created one new column 'num days' to get insights for the duration of PRAN activation. Next, changed the data frame with some necessary columns only which are ; 'Name', 'PRAN', 'Date of Joining', 'PRAN Activation Date', 'Phone No.', 'Email Id.', 'num days', 'IRA Compliant Flag', 'Nomination Flag', for the purpose of adequate analysis which is required to prepare report of NPS oversight .From analysis of this downloaded file, it is possible to get information, whether there is any subscriber whose PRAN number is not IRA compliant, whose nomination details is not provided there and also other details whether these have been incorporated or not in NSDL CRA. An NSDL IRA compliant subscriber is someone who has submitted a Subscriber Registration Form (SI) and whose KYC details are maintained in the Central Recordkeeping Agency (CRA) system. IRA stands for 'individual retirement account'. Analysis for this second file is performed, uploading this file in csv format in the content folder of google collaborator. There are scope for giving input in the execution of the Python file. There is scope for giving three inputs, with input year value and month value, three consecutive inputs, each time year and month together .Based on requirement of NPS oversight, the filtering for the desired duration for three months of any year, are to be executed to get the output with number of NPS, joined for a certain period, number of activation of PRAN, for a certain period, number of subscribers whose PRAN have been generated within twenty days (20 days) or not, all this information is available from the analysis of this updated downloaded file, obtained from NSDL CRA, necessary just before preparing the report for NPS oversight with certain period. Similar as this analysis, analysis with the second file, the file with records of NPS subscribers, joined to the region with submission of adequate forms for activation or shifting of PRAN. Besides analysis separately for two files as described, comparison between them also are performed by concatenation process of Python code, to understand the mismatch of subscribers in both the files. From the whole analysis process, can have insights as required with necessary details to submit report of NPS oversight. For the case of submission of ISS forms, for those who had already generated PRAN, these subscribers' data can be obtained in NSDL after shifting of their PRAN number to this target region. So for this type of case, number of days of activation of PRAN should not be considered similar as the consideration of the same for the subscriber, who have joined without having PRAN number. For subscribers who have the purpose of subscriber shifting, their cases have to be checked with the incorporation of their PRAN number in the region. All these can be checked and verified with the help of Python analysis in google collaborator.

Significance of the Study

At the time when the task of preparation of NPS oversight report to get insights of PRAN generation was started, soon after some quarters, the necessity of preparation of the report with the help of some software was felt soon, as whenever it was required to supply the details, all the necessary number details had to be counted, along with duration of PRAN activation to check whether the PRAN has been generated within time, i.e. within twenty days or not. To figure out all these details it was the difficult and time taking long process to check the name one by one along with other details unique to them for the purpose of having information about their PRAN. Moreover as several names are common there, in the downloaded file, obtained from NSDL, chance of mistake was there also. So from this time, the purpose of some automatic output was felt eventually to get rid of this difficult task of searching repeatedly. Moreover when the number of subscribers, joined to the region is much more higher, it was really beyond manage to check all these necessary details for preparation of oversight report. So started thinking to find some means to figure out the necessary data related with PRAN generation and to supply for oversight meeting whenever required whether in quarterly basis or urgently needed some time. The Python analysis with adequate code to get the desired output, dealt with the files, downloaded from NSDL as well as with manually maintained EXCEL file.

Conclusion and Future Work

The analysis can give insights about the status of NPS PRAN generation, subscriber shifting as well as time taken to generate PRAN. Moreover, information about nomination, IRA details, contact details, all other information can also be obtained in this way. How many CSRF forms, ISS forms, submitted, individually, this data also can be obtained from this analysis. If necessary details are required with respect to some subscriber, that also can be done providing input as PRAN number. In future some addition, alteration also may be made depending on requirements if necessary.

Some Screenshots of Analysis

Some relevant screenshots as pasted below can help in better understanding about the nature of analysis.

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Image 4: Subtracting the Data Set to Get Data without PRAN and PRAN Generation within Twenty Days

🖸 Name PRAN Date of Joining PRAN Activation Date Phone No. Email Id. num_days IRA Compliant Flag Nomination Fla

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