Configuration Manual

MSc Research Project
Fintech

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MSc Project Submission Sheet

School of Computing

Student Name:	……. Smitha Vishwanath Devanga…………………………………………………
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Programme:	……… MSc in Fintech ……………………………… **Year:** ……2022-2023..
Module:	…………………………………………………………………………………….………
Lecturer:	……… Noel Cosgrave …………………………………………………..………
Submission Due Date:	…………14th August 2023 …………………………………………..………
Project Title:	………… Significance of Regulatory Technology and its Impact on Banks and Financial Institutions amongst the Growth of Decentralized Finance……………………………………………………………..………
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1   Introduction

As part of the thesis research report for the title - Significance of Regulatory Technology and its Impact on Banks and Financial Institutions amongst the Growth of Decentralized Finance, A qualitative survey of the working profession was conducted and information was gathered from 102 respondents. As part of the research, the researcher performed various analyses in R studio to get a better understanding of the survey data. The information on all the requirements which are required to re-run the test for the analysis including the hardware & software configuration are outlined below.

2   System configuration

2.1   Hardware Configuration

- Processor   11th Gen Intel(R) Core(TM) i5-1135G7 @ 2.40GHz 2.42 GHz
- Installed RAM   16.0 GB (15.8 GB usable)
- System type   64-bit operating system, x64-based processor

2.2   Software Configuration

- **RStudio**   2023.06.1+524   "Mountain   Hydrangea"   Release (547dcf861cac0253a8abb52c135e44e02ba407a1, 2023-07-07) for Windows Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) RStudio/2023.06.1+524 Chrome/110.0.5481.208 Electron/23.3.0 Safari/537.36 - For Analysis of Data
- **Microsoft® Excel®** 2021 MSO (Version 2307 Build 16.0.16626.20086) 64-bit, Data was saved in Excel format and a few of the function was performed on Excel-like pivot for descriptive analysis and a few graphs chart for analysis -
- **Google form &Sheet** – Google form was considered for conducting the survey and sheet to capture the responses of the survey.

3 Data

Data was collected using Google form, where the survey was floated across various social media like LinkedIn and WhatsApp to get a better understanding of the awareness among the respondents with regards to Regtech and Defi and the various factors which would impact implementing Regtech with the Organisation

4 Data Analysis

4.1 Data preparation

Data have been saved in CSV format named Responses_Analysis.csv which was considered for analysis and performing various models on R studio. Response on location was changed in CSV to have standardized information for analysis. Like Dublin, Dublin, Ireland was changed to Ireland for analysis purposes.

4.2 Installation of Package in R studio

All the required packages like dpylr, tidyr, psych,factoextra, and their libraries are to be installed in R studio to perform various analyses and formatting of data to get the desired result.

4.3 Loading data in R and deleting unnecessary information.

Responses data has been loaded in R studio with the help of the setwd function and post loading the timestamp, email address, name, and name of the organization have been deleted as they were not required for analysis.

4.4 Formatting the data for analysis which is required for analysis

Survey data is qualitative data, which contains, long questions, and character values in the form of responses, same needs to be standardized as a requirement which are required for the analysis, renamed the whole question to 1 word using mutate function for easy reference, Responses to the survey question needs to be amended from qualitative to quantitative.

4.5 Analysis of Dataset

4.5.1 Descriptive Analysis

For Descriptive Analysis, first, the data has been converted into a factor variable and the level of 1 parameter has been checked which is awareness using mutate function. Post that Describes() function has been considered to get the output of all the factors which would produce the result factors including – mean, mean, variance, standard deviation, min, max. And later the ggplot2 function of graphic representation has been considered to view the output in graphical format. The count and the percentage of the responses are been done in excel using pivot function.

4.5.2 Chi-Square test

For Chi-square a contingency table with a loop function has been created which would consider 2 variables at a given time to produce the Chi-square test. This result helps us to identify if both parameters have a significant relationship with each other.

4.5.3 Factor Analysis

In order to perform the factor analysis, the qualitative data has been converted to quantitative with the help of the mutate functionality, where all the required factors were labeled in order to get the required result. with the help of the STR function the non-numeric value are been removed to perform the required test, Code has been executed to plot the Scree plot and parallel Scree plot to identify the number of factors that need to be considered for factor analysis. Based on the output factor analysis was executed to get the desired result and factor analysis has been presented in graphical form as well for easy reference.

Functions considered to run factor analysis are

- Mutate () – to label the response into a numeric value
- Fafitfree () – to run factor analysis
- Ggplot() – for graphical representation of factor analysis
- fa. diagram() – to represent the factor analysis in graphical diagram form (tree diagram)

4.5.4 Fisher Exact

For the Fisher analysis, a Contingency table has been created with different parameters to get the P-value and other information as per the requirement.

- Fisher.test() has been executed for Fisher exact test.

4.5.5 Correlation Map

A Correlation heat map has been generated for a graphical representation of complete survey data which can be easily interpreted to understand the correlation between various factors.

- Is. Numeric () – to exclude the non-numeric columns
- Cor_matrix() – to run correlation matrix
- Ggplot() – to map the correlation of each variable in graphical representation form

References

(Zach, 2020) Zach (2020). *Chi-Square Test of Independence in R (With Examples)*. [online] Statology. Available at: https://www.statology.org/chi-square-test-of-independence-in-r/.

(Khan Academy, n.d.) Khan Academy. (n.d.). *Test statistic and P-value in chi-square tests with two-way tables (practice)*. [online] Available at: https://www.khanacademy.org/math/ap-statistics/chi-square-tests/chi-square-tests-two-way-tables/e/test-statistics-p-values-chi-square-tests-two-way-tables [Accessed 10 Aug. 2023].

(Biswal, 2023) Biswal, A. (2023). *What is a Chi-Square Test? Formula, Examples & Uses | Simplilearn*. [online] Simplilearn.com. Available at: https://www.simplilearn.com/tutorials/statistics-tutorial/chi-square-test.