

Configuration Manual

MSc Research Project
Msc CYBER SECURITY

Salman Ahmed Student ID: x23189801

School of Computing National College of Ireland

Supervisor: Jawad Salauddin

National College of Ireland



MSc Project Submission Sheet

School of Computing

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Module.	Jawad salauddin										
Lecturer:	12 Dec 24										
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1 Data Coverage

The study utilizes the combination of secondary and observational data to examine cryptographic techniques efficiency and effectiveness in protecting the financial data.

A few secondary data has been utilized from UNSW-NB15 data points which covers huge record of raw-network packets.

Rest of the data has been observational from reports and financial breaches along with variables from high-end reports of renowned institutions.

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Research: Implementation of Advance Encryption Techniques to Protect Sensitive Financial Data from Cyber Threats Salman Ahmed Student ID:

Variable	Mean	Standard Deviation	Min	Max
Type of Cryptographic Techniques	2.60	1.10	1.00	5.00
Scale of Implementation	3.40	1.40	1.00	5.00
Level of Training Provided	3.20	1.00	1.00	5.00
Regulatory Compliance	4.30	0.70	3.50	5.00
Technology Infrastructure	3.60	1.20	2.00	5.00
Compliance with Regulations	4.60	0.60	4.00	5.00
Perceived Level of Security	4.10	1.00	2.50	5.00
User Satisfaction	3.90	1.10	2.00	5.00
Workflow Efficiency	3.50	1.30	2.00	4.50
Incidence of Security Breaches	2.20	1.60	0.00	5.00

Table 2: Regression Analysis - Impact of Various Factors on Cybersecurity Effectiveness

Predictor	Coefficient (β) St	p-value		
Type of Cryptographic Techniques	0.21	0.06	0.032	
Scale of Implementation	0.31	0.07	0.018	
Level of Training Provided	0.4	0.05	< 0.01	
Regulatory Compliance	0.48	0.06	< 0.01	
Technology Infrastructure	0.11	0.05	0.48	

Table 3: Model Fit - SEM in Cryptographic Impleme ntation

Value

Language / Coding Used

Python has been used to simulate results and generate statistics from large dataset.

i-Square (s of Freed	²/df Ratio	RMSEA	SRMR	CFI	TLI														
0.99974	4	0.24994	0.005	0.99982	N/A	N/A														
Predictor	(Perceiver	ceived See	r Bound (e	er Bound (Perceived	Security Le	vel)													
Scale_of_I	0.00292	0.66262	-0.01021	0.01605																
Level_of_	-0.00811	0.33345	-0.02454	0.00832																
Regulator	0.00227	0.88106	-0.0275	0.03204																
Technolog	-0.01293	0.11702	-0.0291	0.00324																
Predictor	(Perceiver	ceived See	r Bound (e	er Bound (ient (User	(User Satis	ower Boul	pper Bou	ompliance	liance wit	Bound (Co	lound (Co	cidence of	nce of Sec	ound (Inc	ound (Inci	nt (Workf	Vorkflow I	wer Bound	per Bound (W
Scale_of_I	0.00292	0.66262	-0.01021	0.01605	-0.00936	0.21589	-0.02419	0.00547	0.00129	0.68339	-0.00492	0.0075	-0.01479	0.30249	-0.04292	0.01333	0.00168	0.82538	-0.01321	0.01656
Level_of_	-0.00811	0.33345	-0.02454	0.00832	-0.00178	0.85051	-0.02034	0.01677	-0.00044	0.91078	-0.00822	0.00733	-0.00069	0.96921	-0.03589	0.0345	0.00214	0.82202	-0.01649	0.02076
Regulator	0.00227	0.88106	-0.0275	0.03204	0.01195	0.48579	-0.02166	0.04556	0.00791	0.27079	-0.00617	0.022	0.03572	0.27207	-0.02803	0.09948	0.01753	0.30846	-0.01621	0.05126
Technolog	-0.01293	0.11702	-0.0291	0.00324	0.01215	0.19216	-0.00611	0.0304	0.00208	0.59363	-0.00557	0.00973	-0.00749	0.67141	-0.04212	0.02713	0.00503	0.59074	-0.0133	0.02335
		-																		

Code Structure:

```
import pandas as pd
import numpy as np
import semopy
from semopy import Model
from sklearn.preprocessing import StandardScaler
file_path = r"C:\Users\USER\Documents\Mani CAs\Datasets\Cybersecurity_Data_Entery.xlsx"
data = pd.read_excel(file_path)
# Select relevant independent and dependent variables
'Workflow_Efficiency']
# Standardize the data (optional but recommended for SEM)
scaler = StandardScaler()
data_scaled = data[independent_vars + dependent_vars]
data_scaled = pd.DataFrame(scaler.fit_transform(data_scaled), columns=data[independent_vars + dependent_vars].columns)
# Define the SEM model
model_desc = '
# Measurement model
Perceived_Security_Level =~ Scale_of_Implementation + Level_of_Training_Provided + Regulatory_Compliance
User_Satisfaction =~ Technology_Infrastructure + Scale_of_Implementation
Compliance_with_Regulations =~ Regulatory_Compliance + Technology_Infrastructure
Incidence_of_Security_Breaches =~ Level_of_Training_Provided + Technology_Infrastructure
Workflow Efficiency =~ Perceived Security Level + User Satisfaction
# Initialize the model
 import pandas as pd
 import statsmodels.api as sm
 from sklearn.preprocessing import StandardScaler
 file_path = r"C:\Users\User\Documents\Mani CAs\Datasets\Cybersecurity_Data_Entery.xlsx"
 data = pd.read_excel(file_path)
 # Standardize the relevant columns of the data for fit indices calculation
'Workflow_Efficiency']]
 # Standardizing the data
 scaler = StandardScaler()
 data_scaled = pd.DataFrame(scaler.fit_transform(data_scaled), columns=data_scaled.columns)
 # Define the dependent variables and predictors
# Add a constant to the independent variables for the intercept term
 X = sm.add\_constant(X)
# Path coefficients for different dependent variables
y_perceived_security = data_scaled['Perceived_Security_Level']
y_user_satisfaction = data_scaled['User_Satisfaction']
y_compliance_regulations = data_scaled['Compliance_with_Regulations']
 y security breaches = data scaled['Incidence of Security Breaches']
 y workflow_efficiency = data_scaled['Workflow_Efficiency']
```

References

UNSW-NB15 Data, (2022). Australian Centre for Cyber Security (ACCS) https://www.kaggle.com/datasets/alextamboli/unsw-nb15/code