National College of Ireland

Configuration Manual

MSc Research Project
FinTech

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Project Submission Sheet
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Configuration Manual

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1 Introduction and Objective

The Objective of this configuration manual is to provide a clear picture of the configuration parameters and the context in which they are applied. This manual is intended for academic research on topic "Evaluating Cost Savings: RPA & VBA vs. Traditional Business Process ".

2 System Configuration

In this section, Hardware and software requirement is described. Moreover, the tools utilised to conclude the research will be explained below.

2.1 Hardware

2.1.1 Processor (CPU) and Graphics (GPU):

- Apple M1 chip with an 8-core CPU (4 high-performance cores and 4 efficiency cores).
- Integrated 7-core or 8-core GPU, depending on the model.
- 16-core Neural Engine for machine learning tasks.

2.1.2 RAM:

Configurations with 8GB of unified memory (RAM).

2.1.3 Storage

SSD storage of 256GB.

2.2 Software

- Mac Os M1
- Microsoft World
- Microsoft Excel
- Power Point

- Google Colab
- Overleaf

2.3 Tools

- Microsoft world is utilised to create the minutes of the interview; and
- microsoft excel & Google colab is utilised to summarise and analyse the data collected; and
- Overleaf is utilised to write down the report.

3 Project Implementation & Evaluation

3.1 Data Collection

The major data is collected through Survey and interviews from the Leadership. Some insight have been gained from the internship done in the organisation which provides the real experience of this research topic.

3.2 Data Cleaning

Format: Excel workbook is utilised to clean the data. In this step, inconsistencies in the dataset is identified and corrected to improve the quality of data. It is ensured that there is no duplication and mishandling of values and it is ensured that the data is in standard form. The information collected in the interview is summarised.

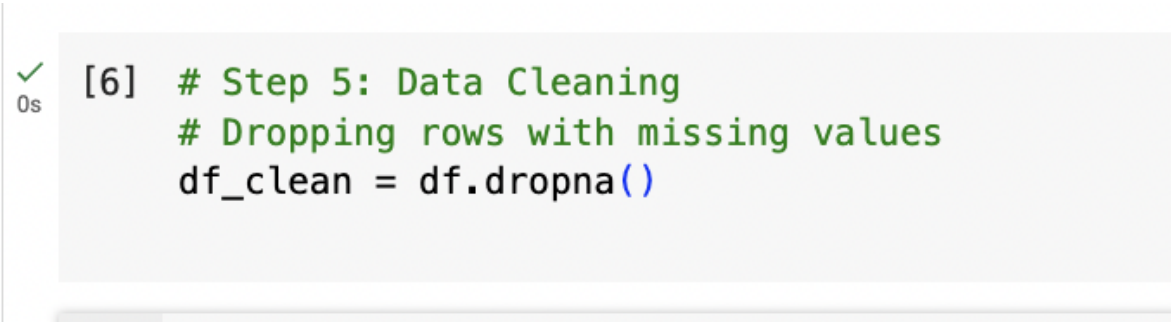

Figure 1: Data Cleaning

3.3 Ananlysis

3.3.1 chi-square test

With a p-value of 0.274, the null hypothesis cannot be ruled out. This shows that there isn't a statistically significant correlation between the 'Department' and the RPA/VBA-induced change in the number of mistakes. Put otherwise, there is no discernible influence of the department on the reported shift in mistake rates brought about by RPA/VBA.

```
# Filter out relevant columns and drop any rows with missing values in those columns
df_chi = df[['Department', 'How has the number of errors in your processes changed with RPA/VBA?']].dropna()

# Create a contingency table
contingency_table = pd.crosstab(df_chi['Department'], df_chi['How has the number of errors in your processes changed with RPA/VBA?'])

# Perform chi-square test
chi2, p, dof, expected = chi2_contingency(contingency_table)

chi2, p, dof, expected
```

```
(14.42327859121488,
 0.27449878460757343,
 12,
 array([[4.81333333, 2.78666667, 7.6       , 2.78666667, 1.01333333],
        [5.32      , 3.08      , 8.4       , 3.08      , 1.12      ],
        [3.8       , 2.2       , 6.        , 2.2       , 0.8       ],
        [5.06666667, 2.93333333, 8.        , 2.93333333, 1.06666667]]))
```

Figure 2: chi-square test

3.3.2 Repetition in Task

To understand the scope of RPA/ VBA in the organisation, the data of hours per week spent on repetitive tasks in a week is collected. The objective of collecting this information is to understand the scope of RPA. in

COUNTA of Full	How many hours per week do you spend on repetitive tasks in a week?						
Department	0-15	0-15, 16-20	16-20	16-20, 21-30	21-30	21-30, 31-37.5	31-37.50	Grand Total
Customer Service		1	7	1	9		5	23
Finance	1		10		8		7	26
HR			7		4	1	4	16
Operations	2		4		7	1	8	22
Grand Total	3	1	28	1	28	2	24	87

Figure 3: Hours Spent on Repititive task Summary

From this implementation, it is analysed that about 33% of average hours in a week is spent on repitative task which can be automated utilising RPA and VBA.

3.3.3 Turnaround Time

To understand if RPA/VBA helped to reduce turn around time, the data of impact on process turnaround time after the implementation of RPA/VBA is gathered. This data is gathered to know how much time we are saving after implementing RPA/VBA. It can benefit us to understand customer/ Management satisfaction with the turn around time.

	How has the implementation of RPA/VBA impacted your process turnaround times?					
	Decreased	Greatly Decreased	Greatly Increased	Increased	No Change	(blank)	Grand Total
COUNTA of Full	26	30	8	9	5	9	87

Figure 4: Turn Around Time effect after implementing RPA/VBA

Implementing RPA/ VBA resulted in overall 64% of decrease in turnaround time whereas in 20% of the activities the turnaround time got increased and around 6% of the activities is not impacted with the implementation of RPA. In short, RPA is helping in reducing turnaround time but in some case it might not be proved as much productive as human resource.

3.3.4 Error Rate

Data of rework on task is collected through survey, to analyse how much time an employee is spending on reworking on task and it resulted in 20% of time is spent on re-work or correction of mistakes. RPA can be proved beneficial in this scenario and the human resource can be utilised in some productive task.

COUNTA of Full	How often d	rework tasks due to errors?					
Department	Always	Never	Often	Rarely	Sometimes	(blank)	Grand Total
Customer Servic	2	7	3	5	5	1	23
Finance		5	5	6	10		26
HR	1	7	1	2	5		16
Operations	3	7	3	7	2		22
Grand Total	6	26	12	20	22	1	87

Average	17.2
%	20.000%

Figure 5: Rework due to Erro before RPA

COUNTA of Full Name	Department				
How have error rates changed since implementing RPA/VBA?	Customer Service	Finance	HR	Operations	Grand Total
Decreased	8	5	3	6	22
Greatly Decreased	1	4	3	3	11
Greatly Increased	6	7	7	6	26
Increased	4	5	2	2	13
No Change	1	3		3	7
(blank)	3	2	1	2	8
Grand Total	23	26	16	22	87

Figure 6: Error Rate after implementing RPA/VBA

From the data gathered through survey, it is noted that 42% of the employees claimed reduction in the error rate after implementing RPA and VBA whereas 49% of the employees are claiming increase in error rate and according to 9% of the employees there is no change in error rate.

The information gathered from the leadership states that the KPI shows a positive image of reduction in error rates after implementing VBA and RPA.

3.3.5 Labour Cost Reduction

In Interview, Leadership stated that there is a good 30% reduction in the labour cost.

3.3.6 Return on Investment (ROI)

The ROI for our RPA and VBA implementations has exceeded the expectations of management. Initially, the projected payback period was of 26 months for the RPA projects. However, the company achieved payback within just 16 months due to faster-than-anticipated efficiency gains and labor cost savings. For VBA, the ROI is harder to quantify in exact financial terms, but the time savings and error reductions have provided substantial indirect benefits. Overall, the estimate an ROI of around 180% for RPA and around 120% for VBA implementations over three years as per management.

References

```python
import matplotlib.pyplot as plt
import seaborn as sns

plt.figure(figsize=(10, 6))
sns.barplot(x=['Pre-Implementation', 'Post-Implementation'], y=[100, 70])  #It is reported in the interview that there is a 30%
plt.title('Labor Cost Reduction Due to RPA/VBA Implementation')
plt.xlabel('Phase')
plt.ylabel('Labor Cost Index')
plt.show()
```

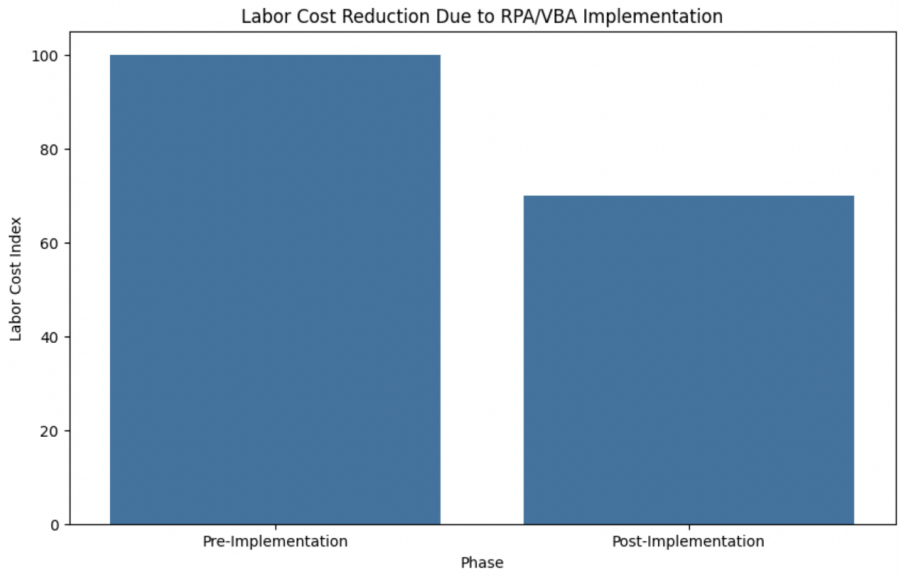

Figure 7: Labour cost reduction

```
plt.figure(figsize=(10, 6))
roi = ['RPA', 'VBA']
roi_values = [180, 120]
sns.barplot(x=roi, y=roi_values, palette='Greens_d')
plt.title('ROI of RPA and VBA Implementations')
plt.xlabel('Automation Tool')
plt.ylabel('ROI (%)')
plt.show()
```

```
<ipython-input-29-40d37f88b6db>:4: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `x` variable to `hue` and set

  sns.barplot(x=roi, y=roi_values, palette='Greens_d')
```

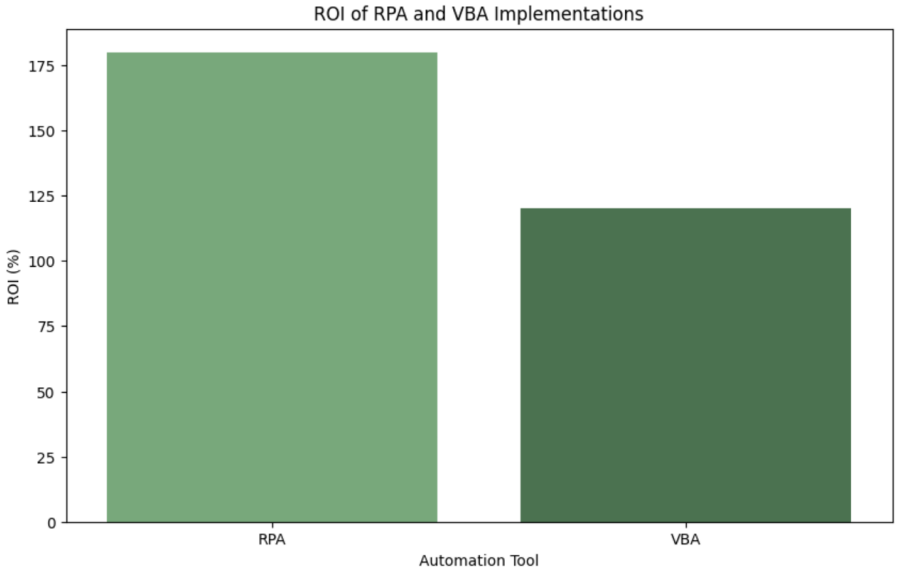

Figure 8: Return on Investment (ROI)