



Leveraging Advanced Technologies at Zakat, Tax, and Customs Authority (ZATCA) - Kingdom of Saudi Arabia

October, 2023

 Introduction about advanced technologies.

 Robotic Process Automation.

 Text Analytics.

 What's after text analytics?





INTRODUCTION

- 1 Large number of processes for Zakat, Tax, and Customs.
- 2 Huge number of requests for different services.
- 3 Some processes require human effort and manual work.
- 4 Customs collect and generate massive and various amount of data on a day-to-day basis.





Robotic Process Automation (RPA)

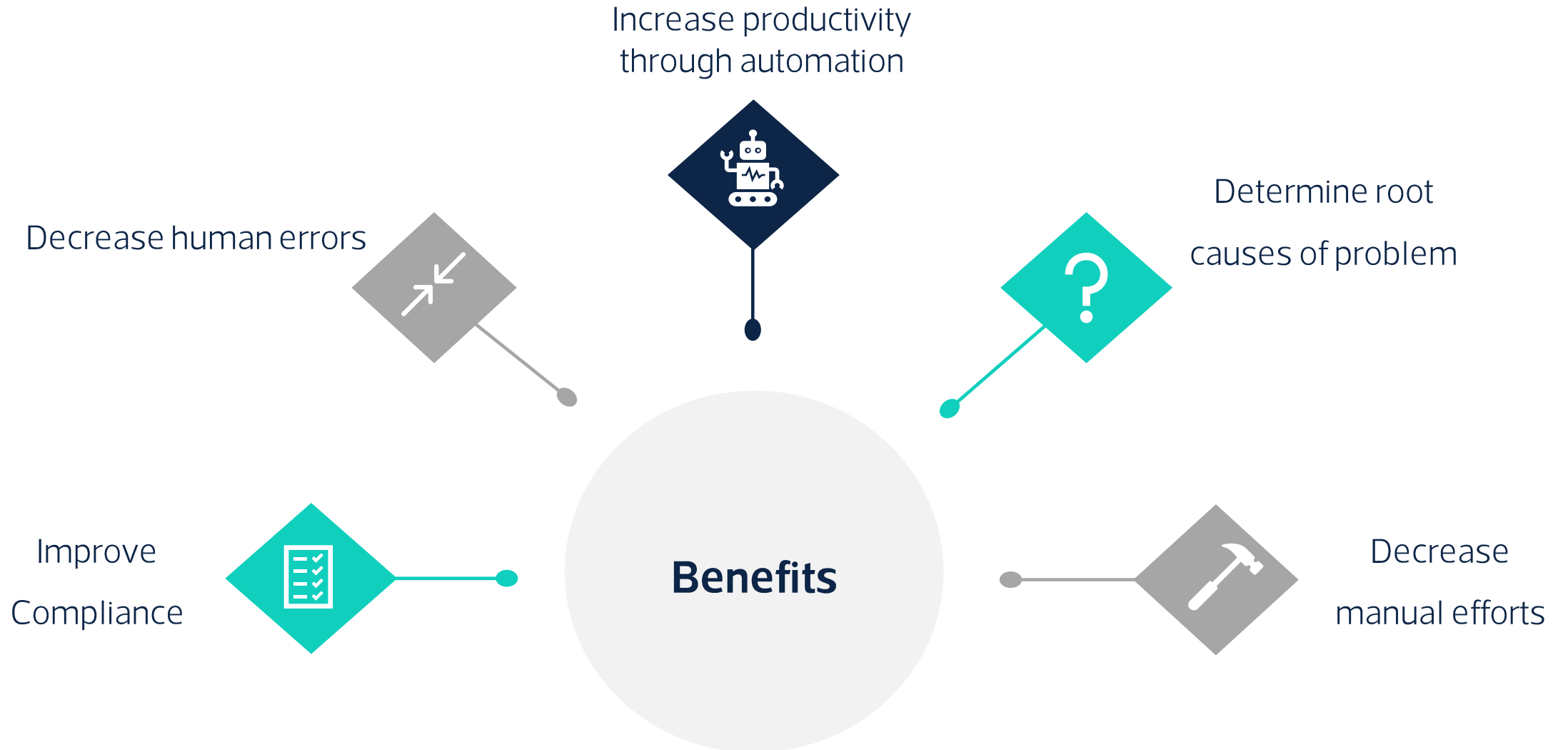
"RPA is the process by which a software bot uses a combination of automation, computer vision, and machine learning to automate repetitive, high-volume tasks that are rule-based and trigger-driven" -David Landreman



Text Analytics

Text analytics is the process of deriving actionable information and insights from unstructured data (textual data) using different techniques such as Machine Learning (ML) and Natural Language Processing (NLP).

BENEFITS OF ADVANCED TECHNOLOGIES





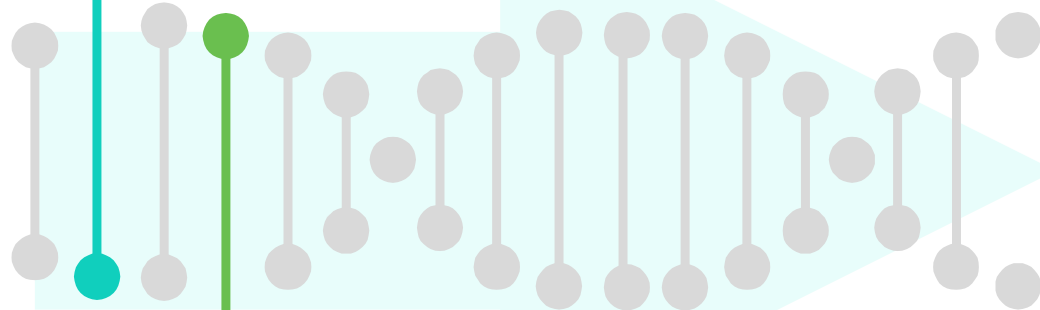
1 ROBOTIC PROCESS AUTOMATION

Robotic Process Automation Example

The Digital Employee "Ziad" - Overview



Using RPA in automating some of the repetitive computer-based tasks and processes that consumes time and efforts by ZATCA employees



Using Artificial Intelligence (AI) technology and tools to improve operational business model across ZATCA (i.e., Machine Learning, Image Processing, Deep Learning)

Outcomes and Benefits

- Transform operational processes and reduce the delivery and maintenance costs, assets lifecycle management and increase efficiency and productivity management.
- Reduction of the required complexity of the processes, screen-locking and screensavers.

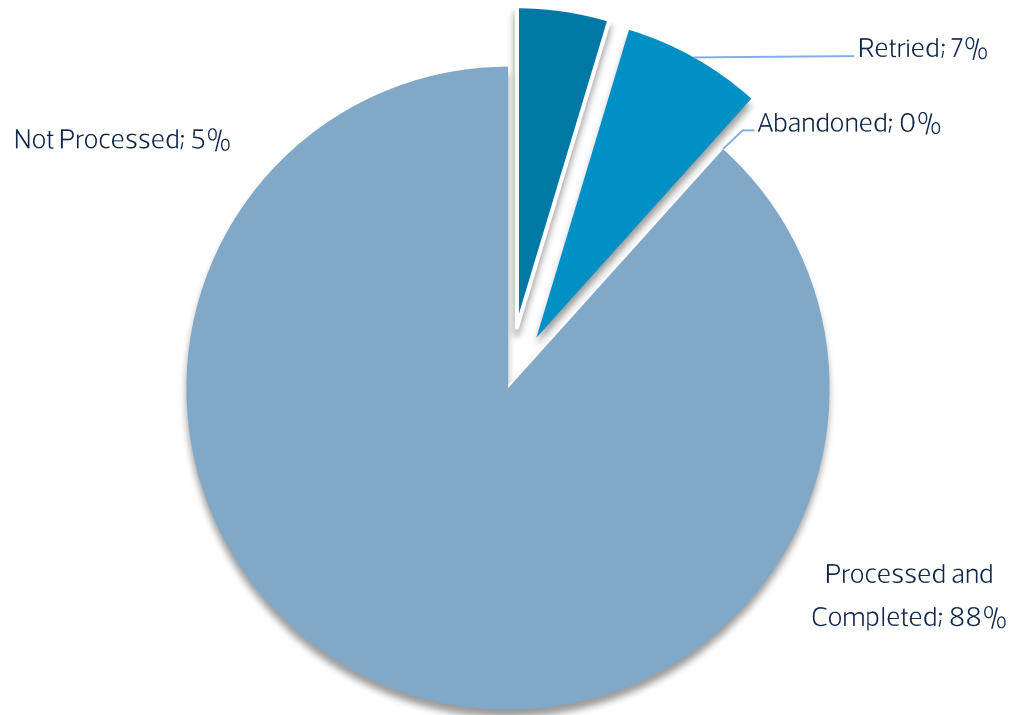


Robotic Process Automation Example

The Digital Employee "Ziad" Statistics for the Launched Use Cases



Request to Close Pledges



■ Not Processed ■ Retried ■ Abandoned ■ Processed and Completed



Usage Insights

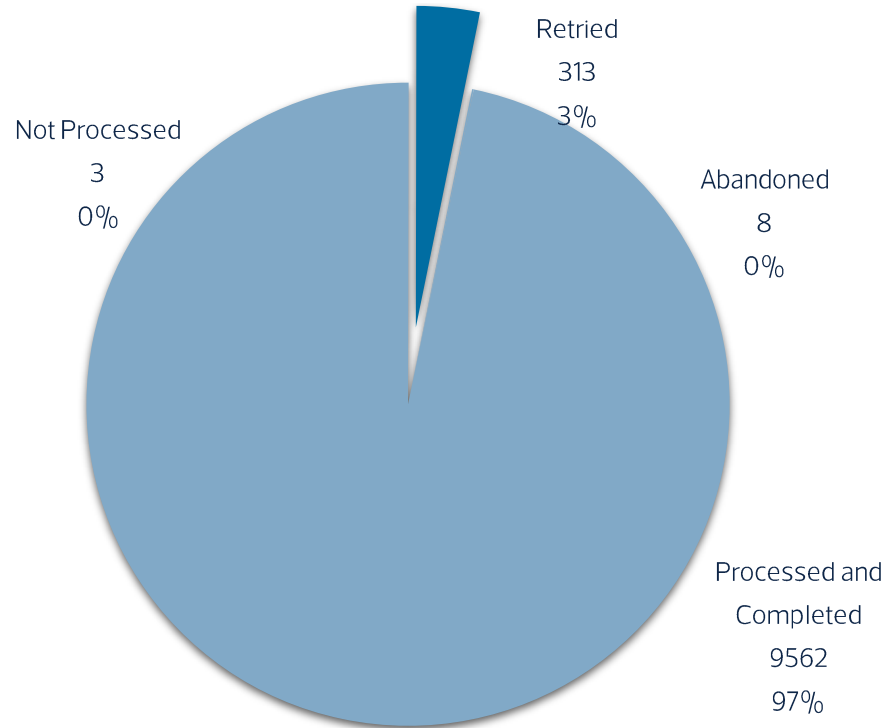
Average time for one process after RPA	104 seconds
Full time employees that used to perform the process manually	14
The average case handling time (normal case)	15 minutes
The average case handling time (complicated cases)	30 minutes

Robotic Process Automation Example

The Digital Employee "Ziad" Statistics for the Launched Use Cases



Saudi Food and Drug Authority Rejection



■ Not Processed ■ Retried ■ Abandoned ■ Processed and Completed



Usage Insights

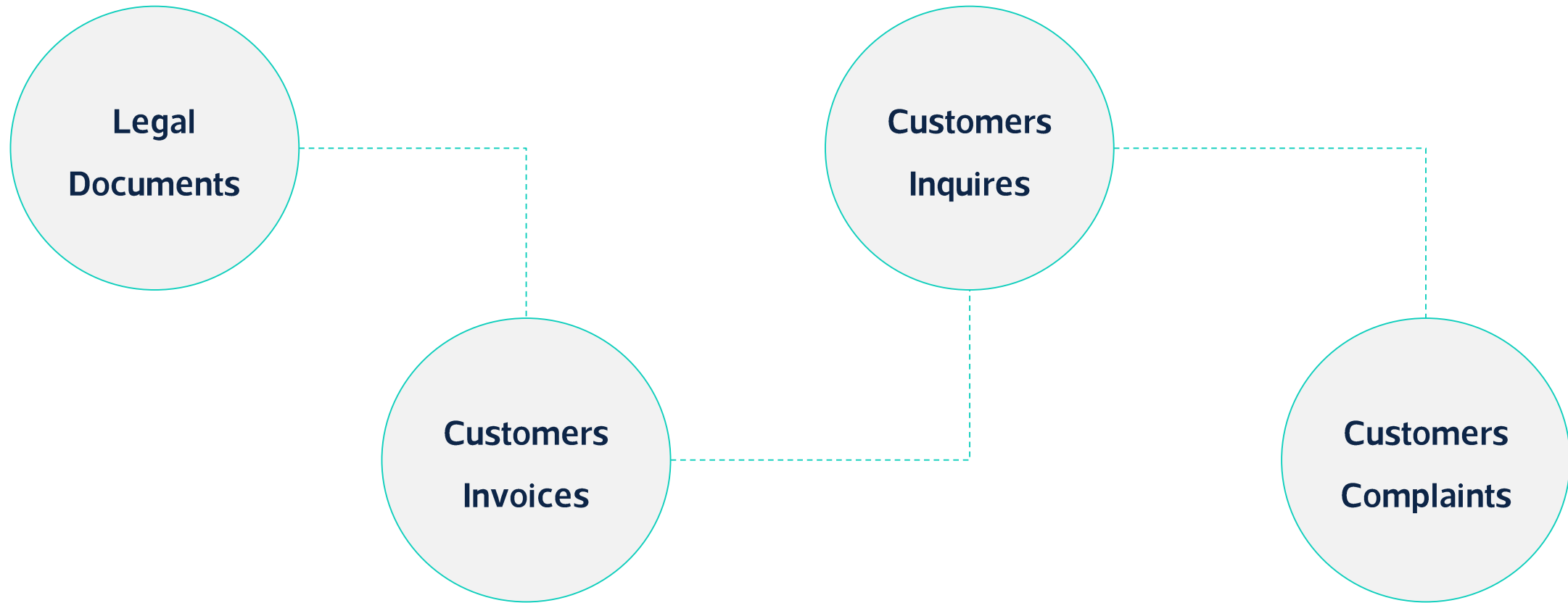
Average time for one process after RPA	77 seconds
Full time employees that used to perform the process manually	150
The average case handling time (normal case)	2 minutes
The average case handling time (complicated cases)	3 minutes



TEXT ANALYTICS

- Global NLP market is predicted to grow from \$21 million in 2021 to \$160 million in 2029, exhibiting a compound annual growth rate of 18.1% - a report by Fortune Business Insights.
- Verizon's Business Service Assurance group was able to save around 10,000 working hours per month in digitally processing customer requests.
- Aetna, a health insurance company, was able to save around \$6 million through automating the process of reading payment notes, calculating pricing, and adjusting the claim.





ZATCA APPLICATION OF TEXT ANALYTICS

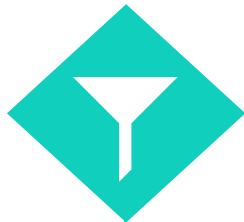
Use Case Problem

- 1 More than 20,000 objections raised in 2022.
- 2 Each objection is assigned manually and handled by a reviewer.
- 3 All technical studies are written in Arabic in electronic documents.
- 4 Limited study of common key reasons of objections.



ZATCA APPLICATION OF TEXT ANALYTICS

Use Case Solution



Develop a Categorization Model, leveraging NLP and Machine Learning in the "Technical Study" documents



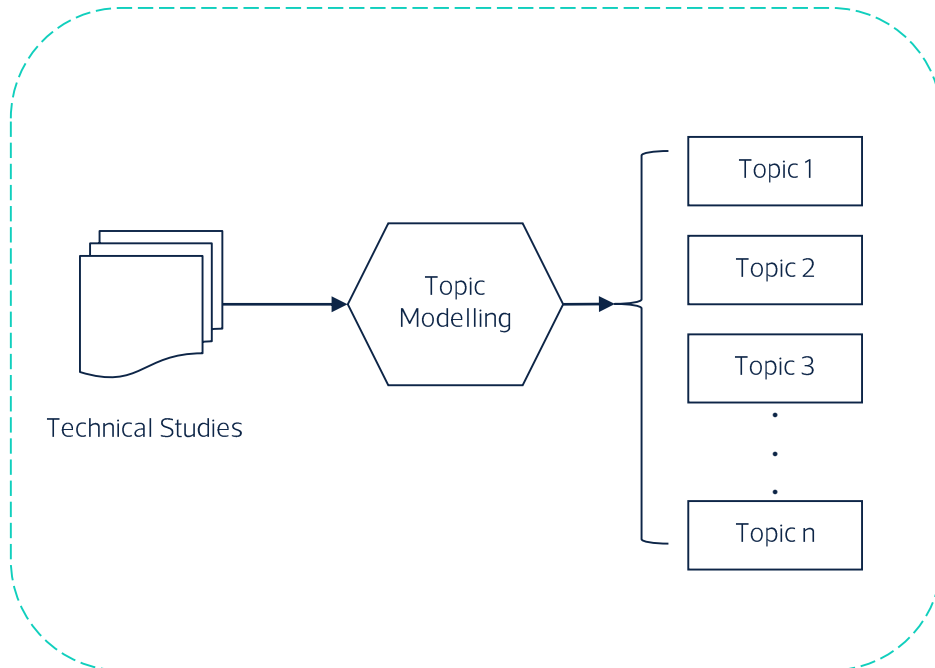
Develop a reusable algorithm to categorize the future objection cases



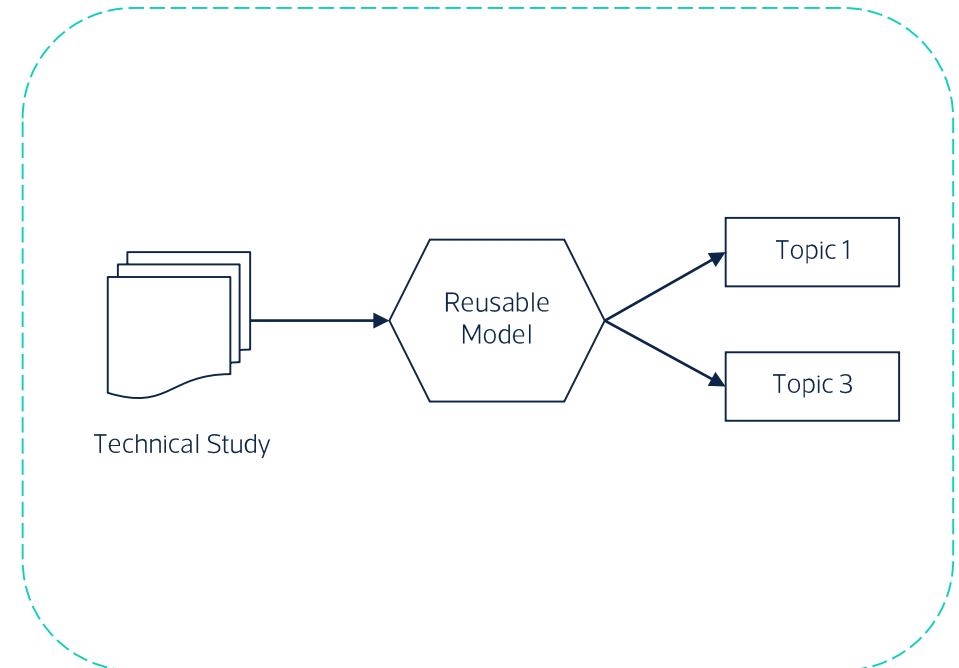
ZATCA APPLICATION OF TEXT ANALYTICS

Use Case Results

1 List of objections topics



2 Knowledge about key reasons of objections



WHAT HAPPENS AFTER TEXT ANALYTICS?

- The result of text analytics is rich and could be utilized in different ways depending on the need:
 - Prediction model.
 - Visualization.
 - Improve the process.
 - Sentiment analysis.
 - ... etc.





CONCLUSION

- Customs operations and tasks are required to be fast with high compliance.
- Leveraging advanced technologies help reduce human errors, and improve productivity and processing time.
- Customs have many unstructured data that can be exploited by AI/ML techniques in order to provide effective solutions.
- The application of advanced technologies has proved effective results in Customs and other domains.



REFERENCES

- K. Casey, "How to explain Robotic Process Automation (RPA) in plain English," The Enterprisers Project. <https://enterpriseproject.com/article/2019/5/rpa-robotic-process-automation-how-explain>
- Sarkar, D., 2016. *Text analytics with python* (Vol. 2). New York, NY, USA:: Apress.
- Rukanova, B., Tan, Y.H., Slegt, M., Molenhuis, M., VanRijnsoever, B., Plecko, K., Caglayan, B. and Shorten, G., 2019. Value of big data analytics for customs supervision in e-commerce. In *Electronic Government: 18th IFIP WG 8.5 International Conference, EGOV 2019, San Benedetto Del Tronto, Italy, September 2–4, 2019, Proceedings 18* (pp. 288-300). Springer International Publishing.
- "Gartner Report Highlights the Power of Unstructured Data Analytics & Indico Data." *Indico Data*, 19 Aug. 2021, indicodata.ai/what-is-unstructured-data.
- Chen, Michelle. "A Guide: Text Analysis, Text Analytics and Text Mining." *Medium*, 27 Oct. 2020, towardsdatascience.com/a-guide-text-analysis-text-analytics-text-mining-f62df7b78747.
- heliuminteractive. "How Text Mining Impacts Business - Ascribe." *Ascribe*, 28 July 2020, goascribe.com/blog/how-text-mining-impacts-business.
- NetSuite.com. "What Is Text Mining and How Does It Work?" *Oracle NetSuite*, 9 June 2022, www.netsuite.com/portal/resource/articles/data-warehouse/text-mining.shtml.
- Haije, Erin Gilliam. "What Is Text Analytics? And Why Should I Care? - Mopinion." *Mopinion*, 10 Apr. 2019, mopinion.com/what-is-text-analytics-benefits.
- El Rifai, H., Al Qadi, L., & Elnagar, A. (2021, September 1). *Arabic text classification: The need for multi-labeling systems - neural computing and applications*. SpringerLink.
- Olavsrud, Author: Thor. "The Business Value of NLP: 5 Success Stories." *CIO*, 16 Sept. 2022, www.cio.com/article/193456/the-business-value-of-nlp-5-success-stories.html.
- "Natural Language Processing [NLP] Market Size | Growth, 2029." *Natural Language Processing [NLP] Market Size | Growth, 2029*, www.fortunebusinessinsights.com/industry-reports/natural-language-processing-nlp-market-101933.

هيئة الزكاة والضريبة والجمارك
Zakat, Tax and Customs Authority



THANK YOU

