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# MRP PROPOSAL ON HONEYBEE PESTS & PATHOGENS IN ONTARIO APIARIES

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BIG DATA ANALYTICS – BDAT1003 – BUSINESS PROCESSES 02  
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## Introduction

Georgian college's big data team is creating a report on pests and pathogens level in apiaries of honeybee in a particular province, Ontario. Ontario government conducted a multi-year monitoring project from 2015 to 2018. The prevalence and load (levels or intensity) of pathogens at various times during the beekeeping season was also assessed. This report will focus on the data of year 2018. Using the report, team would like to analyse:

1. Which area has highest affected ratio (individually)?
2. Least affected colonies per monitoring site
3. Which season has more pathogens and pests?
4. Which site's colonies have no. of chalkbrood more than 10? how many of them
5. Comparison of infected percentage of Acute bee paralysis virus, deformed wing virus, Israeli acute paralysis virus, Nosema ceraene virus, Kashmir bee virus, scabrood virus, tracheal mite infestation.
6. Which virus attacks comb on which season?
7. Comparison of previous year report with current year and see if there is deduction in pests or it has become worst

Using these insights and visualizations, Ontario government can take actions to keep the ongoing practices if the pests' ratio is lesser than previous year and if its worse than previous year, plan and improve the current scenario by introducing proper guidelines.

## About the client

Richard Lambroff, a professional with more than 14 years of experience in financial markets, and now is an instructor in Georgian College, is working with the project team in Big Data Analytics to create a report on pests and pathogens in Ontario apiaries and how the problem of pests and pathogens can be reduced.

## Background of the topic

Every year, the data of pests and pathogens in Ontario's apiaries is collected and updated. This data is based on pests and pathogens in Ontario's apiaries of year 2018 which contains data of pest and pathogen categories like:

- Chalkbrood
- Acute bee paralysis virus
- Deformed wing virus
- Israeli acute paralysis virus
- Nosema ceraene virus
- Kashmir bee virus
- Scabrood virus
- Tracheal mite infestation.

## Client's need

The client needs insights and visualizations on pests and pathogens data of year 2018 and predictive analysis of upcoming year

## Project Rationale

This project is noteworthy as it will help to get an idea about how province or city can improve the current scenario and reduce the pests and pathogen rate by enforcing some guidelines.

## Project Description

We will analyze about pests and pathogens in Ontario's apiaries and compare it with previous year's report. We will be analyzing rate of individual pests per monitoring site. As a result, we will be deriving an insight comparing previous year pest ratio and the current ratio.

## Objective

The objective of this project is to develop a data analysis report for our client which will help them to get reports about

- Name of pests attacking comb as per season.
- Which pest or pathogen attacks more on comb.
- Improvements that can be made to reduce the pests and pathogens rate using the given predictive analysis.

## Requirements

- Obtain the relative data set from the company
- Data must be in line with python and Power BI
- Data must be analyzed with Excel
- Data analysis should include the metrics and trends
- Results must be visualized through visualization tools with clear and descriptive explanations

## **Scope of Project and Out of Scope**

- Project Scope:
  - i. Data analysis on pests and pathogens of year 2018 and predictive analysis for upcoming year
  - ii. Data visualization of the analyzed data
  - iii. Guidance or recommendations to improve the scenario
- Out of Scope:
  - i. Develop a website for the client

## **Outcomes and Benefits**

The Project's outcomes, their value-added and benefits are as follows:

- This analysis report will provide a valuable insight to the client's company about what steps they can take to manage the different kind of viruses
- Enables to take necessary actions in each monitoring site
- Using this data analysis report as reference, the company can introduce more schemes to reduce the virus affected sites

## **Deliverables**

- Database to be processed with complete set of data which contains details on different kind of pest and pathogen attacks
- Present a data visualization which displays the above points during 2021
- Transfer the knowledge of all research, analysis, visualizations, analysis models, testing, codes, formulas, algorithms, technology, documentation and work product

## Team Profiles

Name	Role	Experience/Skills
Moganaviniith Rathinavel	Team lead /Developer	<ul style="list-style-type: none"><li>• 2 years of experience as a data analyst has exposure to SQL, power bi and excel.</li><li>• Exposure to oracle database SQL</li><li>• Know data mining can perform sentimental analysis, linear regression and Multilinear regression.</li><li>• Automated several process using python</li></ul>
Gangani Paras	Analyst	<ul style="list-style-type: none"><li>• Mathematical and statistical knowledge</li><li>• Familiar with python, SQL, Microsoft Excel</li></ul>
Ragavi Mudaliyar	Communicator	<ul style="list-style-type: none"><li>• Worked under a sales team, where had an experience in daily interaction with clients</li><li>• Was a leader of an academic project team and ranked as 2<sup>nd</sup> best team</li><li>• Good vocal communication skills</li></ul>

## Execution

Everyone in our group has enough knowledge in our field and, also had an experience in either academic or professional career. So, our team will be the best choice for this project and, we will be completing the project by deadline to meet the client's expectations.

## Resources

In this project, we will collect numerical data from previous years that was collected by the company.

- To complete this project, we will use power BI to process the data and to make a visualization
- And we will use Microsoft Excel to store and categorize the data
- And we will use python to extract the data

## Techniques

Cleaning the data:

- By cleaning the data, we are going to eliminate the data that are not useful for this project. For instance, we can remove a duplicate data and incorrectly formatted data
- Also, we will add meaningful data that we find necessary for this project
- According to us, this will be the important first step to start the project, because it can be time consuming, when we work with a big data. So, this technique can help us to gather only useful data

Share the load:

- as mentioned in our team profile, the team is made of three people with a different skills and experience in different fields. So, we can play our role in this project as per our experience and skills
- In this way, we will divide the work in a various part to share the workload

## **Tools**

Microsoft Excel:

- As we mentioned earlier, in this project, we are going to collect lot of numerical data. So, Microsoft Excel can help us to save this data and to categorize the data accurately
- This tool is very simple to use. So, we can perform numerical operations easily

Power BI:

- This tool will help us to process big amount of data from a different source
- Also, we will make some visualizations using this Power BI tool

Python:

- This tool is selected because python is a user-friendly coding language
- So, it can help us to extract useful categorized data from excel

## **Execution Process**

- (SDLC) Software Development Life Cycle Requirements, designs, development, testing, release
- It will show the use pf different techniques and tools

## **Potential Challenges**

Even though some challenges may develop, we plan to provide the Client with completed analyses and report that answers the key questions. Still, these potential challenges would highly impact our Process and schedule:

## **Risk and Issues Management**

When confronted with issues, the Team will determine the best way to deal with these inconsistencies. If an issue creates obstacles in completing an objective, the Team will contact the Client immediately to notify them, make recommendations and act according to their instructions. Dedication by the Team to resolve issues may impact their ability to achieve the desired timeframe's anticipated results.

## **Timeframe**

The Team will exercise its best efforts to respect deadlines and deliver the anticipated objectives.

## **Project Team**

We are confident in our Team but realize that other demands may come up at certain times (e.g., exams, illness, personal events). If the Project's progress is delayed at any time, the Client will be notified immediately and advised of the Team's plan to accomplish the Project's requirements.

## **Model Selection**

Model selection may be time-consuming. If a misfit is determined, there may not be enough time to select a new model and to complete the Process. The Team will exercise its best efforts to ensure the model selection is appropriate for this Project.

## **Communications**

The Client is committed to supporting the Project Team in achieving the objective and providing additional resources if required.

## **Scope Creep and Changes**

Scope creep can occur when a project's scope is not adequately defined, documented, or controlled. Also, when added into the Project, either by the Client or the Team itself. To avert a project threat, the Team will clearly and accurately document each requirement while planning and only apply their resources to achieving those requirements. When scope changes develop, the Team will document the requirements, identify the impact of the change on the Project, notify the Client, make recommendations and act according to the Client's instructions.

## **Code of Conduct**

### **Ethical Considerations**

- We acknowledge our strict duty of confidentiality.
- We will ensure the observance of ethical practices demonstrating respect, honesty and dignity.
- We will thoroughly follow the Client's directives without deviation from the objectives.
- Value is always present in our thinking.
- Validated data will solely form the basis of our observations, conclusions, recommendations and decision-making.
- We undertake to use holistic analytics strategies and repeatable processes.
- We will thoroughly explain and document our analysis in detail for the Client. We will be transparent in all our activities.
- Moreover, we will check and recheck our research for quality, accuracy, completeness and integrity before presentation to maintain the validity and credibility of the results.
- We will proactively circumvent unethical behavior, such as exaggerating the results of our research.
- We will not falsely interpret, fabricate, embellish or otherwise misrepresent the data to validate our findings or change or omit details favoring making an analysis fit a hypothesis.
- We will be forthright and accountable if we make mistakes.
- We will tell the truth, even if it is bad news.
- Failure to observe deadlines is considered a breach of ethics.

- We have no conflict of interest and will not benefit from this Project.

## Information Management

- We acknowledge that the data is an asset of any organization. The consequences and repercussions of unethical conduct when dealing with an organization's data can be significant and affect an organization's reputation, relationships and, ultimately, its revenues. Even the perception of unethical data handling has the power to undermine both internal and external trust.
- We give assurance that all the information provided is in our trust. It will remain private and protected from damage or alteration unless authorized.
- We will sign a Non-Disclosure Agreement that is acceptable to the Client and adhere to its conditions.
- We will notify the Client of the discovery of any sensitive information at any stage, namely personal identifying information or confidential information. We will make recommendations for addressing the issues and act according to their instructions.
- Original data and other information entrusted to us is stored in a secure location, such as SharePoint, and will remain unaltered.
- Copies of original data will be used for cleaning, discovery, manipulation and analysis.
- Naming conventions and version controls will segregate documentation, datasets and work product. Each will align with the applicable phase of the Project.
- All work will only be conducted through secure applications.
- All our workstations are protected by a password that is unknown to anyone other than the assigned user. No one has access to our workstations, including colleagues, family members and friends.
- All information sharing is secured from potential risks using encrypted channels, such as SharePoint.
- Discussions about the data, analysis and observations will only be amongst client-authorized collaborators and our course instructors.
- All information entrusted to us will only be used for its intended purposes unless specifically approved by the Client.

## Milestones

Milestone	Complete By
Acceptance of Project Charter	Nov 30, 2022
Requirements Phase	Dec 2, 2022
Design Phase	Dec 12, 2022
Development Phase	Dec 15, 2022
Testing Phase	Dec 20, 2022
Release Phase	Jan 2, 2022
Client Presentation	Jan 15, 2022
Handover of the Deliverables Phase	Jan 20, 2022
Project Close-Out Phase	Jan 30, 2022



## Conclusion

Agriculture's primary role is to **provide food for people, raw materials for industry, employment for a large number of people**, capital for agrarian development, and surpluses for the national economy if practiced efficiently. One of the important branches of agriculture is apiaries. This project will focus on how to improve every apiary of Ontario to maximize agricultural profits and serve economy. We will gather the data, present the analysis report and hand over our insights so that, the client can focus on further steps to improvise this situation. We believe, with our experience and curiosity to work on this project, we are committed to successfully complete the project on time as per Client's requirements. Also, we are grateful to Richard Lambroff for giving us this opportunity as this indeed is a great cause for the society.