THE RESEARCH PLAN

A Science Investigatory Project (SIP)

AniLytics: A Software and Mathematical Model (Rice Demand Model) for Monitoring the Local Rice Distribution

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Category: Mathematical and Computational Science
Code

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RATIONALE:

In the Philippines, rice is a common food found in our tables each meal. This leads to the distribution of rice by the local retailers, without any proper system to monitor the demand and relying only on their senses. This leads to a lot of different problems like oversupplying, poor quality of rice sold (due to the time it is stocked), and wasted rice.

Anilytics, A Software and Mathematical Model is designed to respond to the problem. It aims to provide a modernized solution by creating a software base, integrated to a mathematical model called Rice Demand Model which calculates the future demand of rice, considering factors like Average rice consumption, population of the area, purchasing power, competition (stores around the area).

This research provides a low-cost and data-driven solution for the local retailers who solely relies on their feeling to estimate. It provides a practical solution that maybe integrated to the small communities for the purpose of improving their economic stability, rice quality, and calculated well-based forecast for demand.

On a wider scale, AniLytics promotes data literacy towards local retailers and showing how analytics solve a world problem at a local level. Its societal impact includes reduction of food waste, increasing the income, and this research can potentially reduce the price of rice.

RESEARCH QUESTION(S)

1. What are features of AniLytics have to offer in terms of;
   a. Monitoring the Local Rice Distribution
   b. Reducing the unsold rice
2. How do the trend and patters of rice purchase can affect the predictive ability of AniLytics?
3. How accurate are the prediction of AniLytics in terms of predicting the demand?

ENGINEERING GOALS

Our goal is to create a design that is simple but effective and smart solution towards the oversupply of rice in the market. By using actual and real time data and our formula, we want to make sure that there's no waste of food, improve their businesses and ensure that all rice in the market is always new, fresh, and safe to consume.

PROTOTYPE LAYOUT *with size and dimension/legends*

HYPOTHESIS

Null Hypothesis: AniLytics has no significant effect on the unsold supply of rice.

Alternative Hypothesis: AniLytics significantly affects the unsold supply of rice.

METHODS

This study used a quasi-experimental quantitative research design with a hint of comparative design to create and test AniLytics, a software-based tool for monitoring

rice distribution and reducing unsold rice among small-scale retailers.The tool was designed to allow vendors to input weekly data such as rice sold, unsold stocks, current prices, and customer demand. These inputs were used to generate summaries and trend outputs to assist in supply-related decision-making. The researchers developed a mathematical model based on basic variables affecting rice sales performance. The formula processed numerical inputs to identify trends in surplus or insufficient stock. The system was developed to produce summaries and graphs that could inform restocking behavior and pricing decisions. Data was collected from 40 to 70 rice vendors in three major Pasay City public markets: Libertad, Villamor, and Malibay. Vendors participated voluntarily and were selected using purposive sampling. Researchers used a structured, researcher-made survey and short interviews to collect data on: - Weekly rice sold (in kilograms) - Weekly unsold rice (in kilograms) - Retail price per kilogram - Observed customer demand levels Data was collected once per week for 2 to 3 weeks. Vendors either submitted the information manually or with the help of the researchers. No third-party instruments or published tools were used. All materials were original and created solely for this study.

ETHICAL CONSIDERATIONS

Human informed consent:

Before using any of a retailer's data, permission from them will be acquired. The research guarantees openness, data security, and voluntary involvement.

All identifying information from participants will be anonymized. Responses and sales data will be coded to protect identity and stored securely. Results will be presented in a manner that ensures no individual participant can be identified.

Participants shall have the right to withdraw at any stage of the Completion, with or without reasons, without any penalty from the researcher/institution, or any consequence detectable to themselves.

The study does not consider sensitive or intrusive measures. It will cause no fewer than negligible risk regarding physical, psychological, and social well-being for participants, accepting merely sharing information regarding commercial data and viewpoints.

No force, threat, or undue influence shall be exerted upon participants to take part. Rewards will not be offered so as to unduly influence the decision of potential participants toward joining the study.

Use and Storage of Data Collected
Collected data shall be used strictly for academic and software development purposes involved in this research. The data will be stored in password-access-protected devices and deleted after a retention period has lapsed.

RISK AND SAFETY

1. Data privacy and security risk – if the data inserted is personal or from the community, we have to kept it confidential to make sure someone won't access that confidential information.
2. Wrong Prediction – if someone wrongfully typed the data or if there is a mistake in the formula, AniLytics might give a incorrect result.
3. System Error – if the system stops working or crashes on the wrong time like the resupply of rice this may lead to a delay or even loss in income
4. User Misunderstanding – If the user does not fully understand the concept of how to use the AniLytics, they might misinterpret the data or might press the wrong buttons.
5. Relying solely on System – AniLytics is helpful, but too much dependence on it can lead to the loss of flexibility as a business

DATA ANALYSIS.

The data will be collected using surveys and interviews. The collected data including daily rice stock, sales, unsold rice stock, sales, price, and population data will be first examined by its accurateness, precision, and completeness. This collected data will be put on a spreadsheet for organizing and categorizing. Descriptive Statistics such as the average, middle, and interval will be used in summing up the data, while graphs and time plot will be to visualize the trends. Correlation and regression analysis will be used to observe the connection between variables. To test our hypotheses, we will be using the statistical method with significance level of 0.05 to find out if the consumption pattern will affect the demand of the rice. The result of this will be helpful for us to enhance the software's capabilities in term of forecasting.

BUDGET COST ESTIMATES.

Item (s)	**Quantity**	**Estimated Cost (₱)**	**Remarks**
Enumerate Materials/Supplies/Fees			
PROGRAMMER'S FEES	**1**	**38000**	
DOMAIN	**1**	**(UNSURE)**	
Printing/Documentation *Transportation (if applicable)* *Food/Refreshments (if applicable)*		**5000**	
Others (specify): _____			
Total Estimated Cost	**₱___42000_____**		

PARENT AGREEMENT FORM ON STUDENT-HANDLED BUDGET COST ESTIMATES

School Name: **PASAY CITY SOUTH HIGH SCHOOL**
Grade/Section: _____
Research Adviser: **MAY ANN D. ROMANO**
School Year: **2025 – 2026**

Purpose of the Agreement:
This form aims to inform and obtain consent from parents/guardians regarding budget-related costs that will be handled by the students in relation to school-approved activities such as the main science investigatory project, fieldwork, or testing. This is to ensure transparency and collaboration between the school, students, and families.

Student Responsibility:

- The student, with the guidance of the research adviser and in coordination with the group, will manage and monitor the funds responsibly.
- All expenses will be recorded and reported transparently.
- Students will be encouraged to spend wisely and collaborate in reducing unnecessary costs.

Parental Consent and Agreement:
I, the undersigned, parent/legal guardian of:

Researcher: _____
Writer:_____
Material Monitor:_____

☐ I have read and understood the above information regarding the estimated budget that my child may be handling as part of the research project.

☐ I give my consent and support for my child to responsibly manage the indicated budget in coordination with their group and teacher.

☐ I understand that all expenditures will be monitored and may be subject to review by the teacher/adviser.

☐ I agree to coordinate with the teacher for any concerns or clarifications regarding the financial responsibilities involved.

Parent/Guardian Details:
Name: _____
Signature: _____
Contact Number: _____
Date: _____
Name: _____
Signature: _____
Contact Number: _____
Date: _____

Name: _____

Signature: _____
Contact Number: _____
Date: _____

Teacher/Adviser Acknowledgement:
I confirm that the estimated budget has been discussed and clarified to the students and their guardians.

Teacher's Name & Signature: _____
Date: _____

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	JULY	AUGUST	SEPTEMBER	OCTOBER
IMRAD				
FORMULATING				
RPLAN				
METHODOLOGY				
PROTOTYPE				
COLLECTION OF DATA				
INTERPRETATION OF DATA				
PRESENTATION				

.(NOT SURE WHEN THE PRESENTATION IS)

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