Increasing Return of Marketing Investment (ROMI) Case of an Indonesian Fintech Startup Company

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ABSTRACT: During 2023 global economic recession, economic growth is forecasted to decrease from 6% in 2021 to 2,7% in 2023, causing higher inflation and decreasing consumers buying power. Therefore decreasing investors' appetite for the private market. The Venture Capital (VC) investors are avoiding risky start-ups and opt a more secure investment, making start-ups are struggling to raise funds and expected to survive at least for the next few years. PT ABC is an Indonesian fintech start-up company, providing payment system that offers free interbank transfer service for more than 7 million users and hundreds of companies and SMEs to date. As a start-up company funded by Venture Capital investors, PT ABC is impacted directly by the decreasing of investor appetite to fund. The survival strategy of PT ABC is to shift the business goal from "market growth" to "revenue growth", with the implementation of cost cutting and increasing revenue. The functions that get the most of cost cut is Marketing, as employee layoff is not an option in PT ABC. Currently, PT ABC's CMO does not an existing method to justify the marketing spending and how it ties with annual revenue goal, therefore does not have any insight of which marketing channels are productive and unproductive to revenue gain, which is the basis to determine where the cost should be cut from.

Marketing Mix Modelling (MMM) is a multilinear regression with time series analysis that uses spending of each marketing channel as independent variable and sales revenue as dependent variable, with the purpose to determine the Return on Investment (ROI) as a measure of profitability, added with the Economic Value Added of Marketing (EVAM) as a measure of the production of shareholder value. This research is supported with AARRR framework to understand in which stage of the customer journey flow that requires the most support from marketing and sales. The solutions from MMM analysis are in the form of marketing budget proposals to boost revenue, also the implementation of MMM dashboard. From the AARRR framework, obtained the insight that PT ABC's users took a longer time to understand the product value, however, once the users are activated, they tend to be loyal user. Therefore, the stage between Acquisition to Activation requires the most attention and support from the marketing and sales team.

KEYWORDS: AARRR, EVAM, Marketing Mix Effectiveness, Marketing Mix Modelling (MMM), ROI.

INTRODUCTION

Startups are young companies founded with roots in innovation, striving to address flaws in current products or develop entirely new categories of goods/services, fundamentally changing long-established methods of thinking and conducting business for entire industries, and therefore known as "disruptors" in their respective industries. Generally, all this rapid development and innovation is being done to achieve an ultimate goal: going public. In startup terminology, an "exit" means a firm is open for public investment, which gives early investors the opportunity to cash out and profit. (Baldridge and Curry, 2022)

Venture Capitalists (VCs) finance the idea to lose money in the initial years before finding a profitable path, to aim for high growth rather than profitability. High growth means a larger market, higher number of users and transactions. With the mentality of "growth at all cost", most of the capital spending in early-stage startups goes to product development and market penetration through marketing initiatives. Amazon and Facebook are excellent examples of prioritizing growth over profitability. As long as future significant profits can be projected, choosing not to be profitable in favor of growth is currently a strategy for startups. This concludes that "going for profitability too early often means limiting growth", that profits in the early stages of a startup, is now a sign that something isn't right. (Metha, 2021)

From mid-2022, the Indonesian Ministry of Finance, Sri Mulyani repeatedly explained the threat of a global economic recession in 2023 and its impact on the Indonesian private business environment. Global economic growth is forecasted to slow down from 6% in 2021 to 3,2% in 2022 and 2,7% in 2023, causing higher inflation compared to previous decades and tightening financial conditions in most regions. The recession's impact on Indonesia will be a decreasing economic growth and consumer's buying power, which directly impact the financial sector business. The recession is impacting investor's appetite for the private market. Making funding is getting harder and stock prices crash. Looking at Figure below, the number of funding rounds has been decreasing since November 2021 - 2022. With the recession, interest rates are on the rise, making investors have less appetite to invest in risky startups and opt for a more secure investment. The immediate impact of this is that companies will be struggling to raise funds and every investor expects startups to survive at least for the next few years.
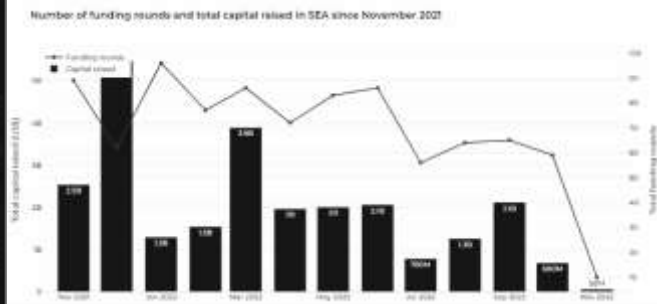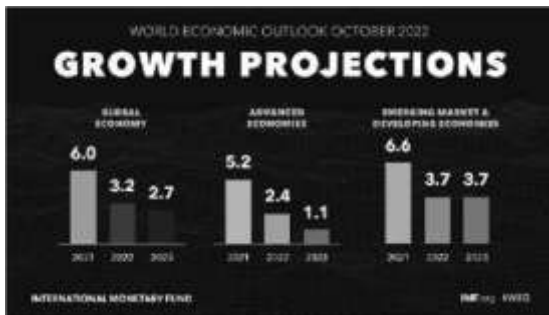
BUSINESS ISSUE

PT ABC as a start-up company, runs its operations from the money it gained from the VC funding rounds. Therefore, a decreasing investors' appetite for funding will make a negative impact on the company's financials. With the principle of "growth at all costs", PT ABC experiencing loss in its annual financial report and have not yet achieved any ROI (return on investment) from its first establishment until 2022. The big spending is mainly for marketing, HR, and operations.

As per January 2023, the PT ABC is shifting its parameter of success from "growth of users and transactions", to "growth to revenue". With the new strategy that aims for profitability, hoping PT ABC will be able to grow sustainably and survive the threat of 2023 global economic recession. To achieve that, there are 2 main strategies: (1) Cutting cost, (2) Increasing revenue. With the strategy of cost cutting in 2023, management ensures that no employee layoffs happen in the company if the cost optimization in the Marketing team can be conducted. This is putting pressure on the Marketing department to provide them with information regarding the return on investment from the campaigns they run due to the substantial amount of financial resources and its conversion to revenue. Currently, PT ABC's Marketing Team is under a lot of pressure to prove quantitatively how their marketing spending is supporting the company to achieve its "Business Goal".

An initial interview conducted with the Head of Marketing confirms that the Marketing Team is currently making the marketing investment budget with no justifications of when and how much ROI is received. Also, the expectation of results coming from marketing activities cannot be tied into the annual targeted revenue. Another finding from the interview is that the marketing team is still unsure of the effectiveness of each marketing activity. All possible opportunities for marketing activities are chased without knowing which of the marketing channel are unproductive.

Table 1. Root Cause Analysis

Problem	1st Why	2nd Why	3rd Why	4th Why	5th Why
Low revenue resulting for financial loss	High acquisition cost	Inefficient marketing budget allocation	The Marketing Team is currently making the marketing budget plan blindly (spending cannot be justified with revenue)	No method in the company to assess which of the marketing investment contributing to ROMI (return on marketing investment)	No method in the company to assess which of the marketing investment contributing to ROMI (return on marketing investment)

Table 2. Gap Analysis

Objective	Current State	Future State	Gap Description	Remedy
Improve the efficiency of marketing investment, maximize sales in the most efficient way	The Marketing Team is currently making the marketing investment budget blindly	The output of marketing expenditures can be assessed, resulting in a higher level of accountability in the marketing planning and budgeting process.	Unknown relation of marketing investment spent to sales performance	MMM + EVAM and AARRR Framework

LITERATURE REVIEW

Marketing Mix or known as the 4Ps (product, price, promotion, and place) is a tactical tool used by business to help determine a brand's offering to the market (McCarthy, 1996, as cited in Pandey et al., 2021). An extension of the Marketing Mix divides marketing factors into two categories: (1) the offering (product, service, packaging, brand, and price); and (2) the process or technique (advertising, promotion, sales, publicity, distribution networks, and new product development) (Frey, 1961, as cited in Abedian, 2022). Marketing Mix planning is a fundamental task in marketing management. Consumers are at the centre of all marketing activities, and marketers strive to reach them by combining marketing mix elements. Each marketing-mix component's survival is dependent on its ability to influence and impact the consumer's feelings, thoughts, and behaviours. The continuous issue that management and stakeholders face is what level or cross-combination of these variables maximizes company KPIs such as sales, market share, or growth. The answer is dependent on the following: How does the company KPI react to previous levels of or expenditure on these variables? (Pandey et al., 2021)

Marketing Mix Modelling

MMM is a decision-making tool to determine an optimal spending allocation and Return on Investment (ROI). MMM uses advanced econometrics and marketing science to objectively assess the efficacy and effectiveness of a comprehensive set of marketing and advertising investments, or efforts to generate sales and growth in the short and long term. This tool allows us to forecast how customers will react in the future and how to effectively plan marketing variables. (Pandey et al., 2021).

## EVAM (Economic Value Added for Marketing)

Economic Value Added (EVA), also known as economic profit, aims to calculate the true economic profit of a company. EVA is used to measure the value a company generates from funds invested in it. In this research, EVA will be used specifically for Marketing Spending, to evaluate its contribution to Revenue. Therefore, will be referred as EVAM (Economic Value Added for Marketing)

AARRR Framework

The AARRR framework was developed by Silicon Valley investor and 500 Startups founder, Dave McClure. He had two objectives with AARRR. First, to demonstrate young companies how to focus only on the metrics that have the potential to significantly impact

the health of their company. Second, to assist these companies in using the appropriate data to assess the effectiveness of their product management and marketing activities, and then improve the unsuccessful ones (Productplan.com, 2022).
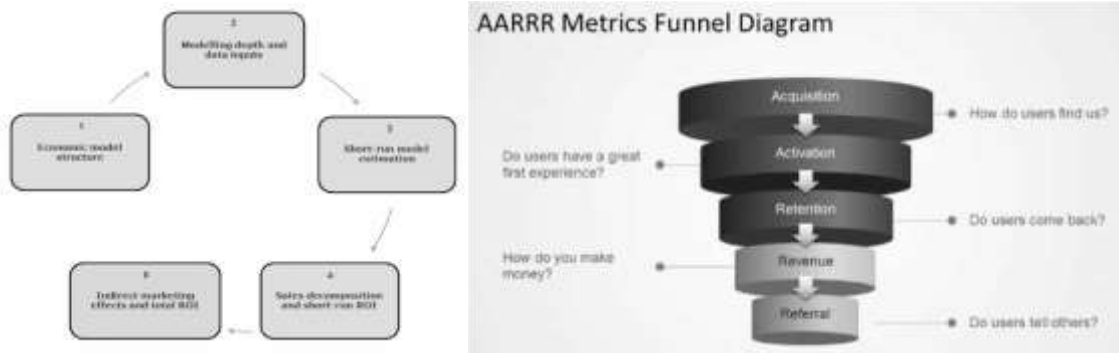
METHODOLOGY

Author collected secondary data from literature studies from earlier available research, data provided by the government, and other valid material found via the internet (Sekaran & Bougie, 2016). Current company's report and metrics that will be needed for improvement, also is collected quantitatively. Below are the data collected and analysis method for this research:

I. Marketing Mix Modelling

Data Collected:

- Product data includes details on the product offered and the price.
- Revenue data (weekly - by industry standard)
- Marketing activities data includes information about the period of the marketing program
- Marketing spending data includes the total investment spent on all marketing activities

Data Analysis Method

1. **Step 1: Economic Model Structure**

   <u>Multiplicative Model with Time Series Analysis</u>

   The multiplicative model term comes from multiplying the MMM's independent variables together. It is a description of the interaction effect of two or more predictor variables on an outcome variable. On the other hand, an additive model sums the individual impacts of several predictors on an outcome. The multiplicative model has several advantages:

   - This model proposes that the business KPI/dependent variable is influenced by a combination of marketing mix variables. Meaning, the independent variables influence the dependent variable in a synergistic manner.
   - Second, the equation suggests that the response of sales to any of the independent variables might take on a variety of forms depending on the value of the coefficient. Meaning the model is versatile enough to capture and simulate interactions of varying forms by calculating suitable response coefficient values.
   - Third, the coefficients not only assess the effects of the independent variables on the dependent variable, but also the elasticities.

2. **Step 2: Modelling Depth and Data Input**

   <u>Ad-Stock Theory</u>

   In Ad-stock theory, advertising is not immediate and has diminishing returns, meaning that its influence diminishes with time, even if more money is committed to it. This method will assist marketers in understanding the possible timing for ad performance and how to optimize the marketing mix to accommodate for these elements. The effect of a media advertisement in any given period of observation is the total of the effect of ongoing promotion and the un-faded/un-decayed component of all past promotions.
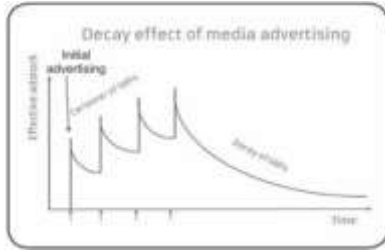
$$A_t = Spend_t + (\lambda * A_{t-1})$$

At is the actual marketing effect at time t and lambda (λ) is the decay rate. Parameter lambda (λ) quantifies the impact of last week's advertisement this week. Lambda is obtained from a Vector Auto Regressive (VAR) model.

Diminishing Marginal Returns

The underlying assumption is that exposure to marketing only generates awareness in the minds of consumers up to a certain point, after which consumers begin to see a saturation effect (the impact of ad exposure starts to diminish over time), implying that additional dollars become less and less efficient at moving the needle, i.e., additional spend in the channel does not generate additional awareness. This kind of relationship may well be shown by taking the exponential or log of GRP.
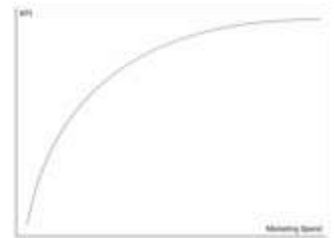
3. Step 3: Short Run Model Estimation

The next step in the process is quantification of the sales response to variation in each of the marketing mix investments. This is where econometrics enters the picture: a statistical regression-based procedure to estimate the parameters of the theoretical demand functions outlined in Step 1, at the appropriate depth outlined in Step 2.

4. Step 4: Sales Decomposing and Short-Term Return

Estimated marketing response parameters are used to decompose product sales into base and incremental revenue.

Base revenue indicates long term consumer preferences. Consisting of:

a) Price: The price of a product is an important base driver of sales as it determines both the consumer group that a product is aimed at and the promotions that are implemented to that audience.

b) Seasonality: Seasonality refers to fluctuations that occur on a regular basis and are frequently the most commercially important periods of the year. Examples include Ramadhan, New Years, Eid al Fitr.

Incremental revenue indicates short-term variations due to promotions, and above-the-line (ATL) and below-the-line (BTL) media activities. Example includes social media campaigns, offline event, price promotion and display activity through to TV, press, magazine, radio, and internet investments. The goal of this study is to measure marketing effectiveness to increase revenue. Once the transformation model is established and the accuracy is accepted, the next step is to calculate the ROI for each marketing channel, with the following formula:

$$ROI = \frac{Total\ Incremental\ Sales\ generated\ by\ the\ activity}{Total\ Budget\ Spent\ on\ the\ activity}$$

5. Step 5: Long-Term Return

Consider the variable yt to be an economic variable we observe over time. Since yt cannot be completely forecasted, therefore we assume that it is random, as is common for most economic variables. Before they are observed, the value of random variables are unknown. A stochastic or random process is the term used to describe the econometric model that produces the time-series variable yt. Example of stochastic process is univariate time series model where a single variable y that is related to past values of itself as well as present and past error terms. The formula of autoregressive model is as follows:

$$y_t = v_t + \rho v_{t-1} + \rho^2 v_{t-2} + \cdots + \rho^t y_0$$

The autoregressive model explains that each variable yt, contains a proportion p of last period value (yt-1) plus error (vt). Also, can be described as: Y season t = beta ^ t-1

II. EVAM

EVAM is a metric that allows us to communicate the results of marketing activities for people outside the marketing departments, especially to shareholders. According to Seggie, Cavusgil, and Phelan (2007). PT ABC' WACC for 2021-2023 is 10%. We may determine the EVAM as follows by modifying the formula to account for the incremental revenue from the marketing activities:

EVAM = Incremental Profit - Marketing Expense x WACC

III. AARRR Framework

Data Collected and Method:

To be able to generally understand the AARRR framework, it must be understood that PT ABC offers a free service of interbank transfer until a certain limit of transaction value. In which users need to upgrade to paid package if they need to transfer beyond the limit offered by the free package. Looking at the business value, PT ABC calculates its performance and customer journey by transactions, not by consumer engagement. Below are the metrics suitable with practical application in the company studied in this research

RESULT & DISCUSSION

I. Marketing Mix Modelling

i) Data Preparation

Variables	Definition
y	Revenue
x1	ATL Promotion & Cashback
x2	Channel Exploration
x3	Community Engagement
x4	CRM (Email, PN, In-app, BTL Promotion etc)
x5	Digital Marketing - Awareness
x6	Digital Marketing - Performance - (BAU and Retargeting Combination)
x7	Digital Marketing - Performance - BAU
x8	Digital Marketing - Performance - Retargeting
x9	Digital Marketing - Retention
x10	Influencer
x11	Out of Home (OOH)
x12	Referral
x13	SEO & ASO
x14	Social Media
x15	Sponsorship and Events
x16	TV

Revenue (dependent variable) and Marketing Spending (independent variable) data was obtained weekly from January 2021 - February 2023 with a total 112 of data set.

ii) Multiple Linear Regression

Variable	Coefficient	Std. Error	t value	Pr(>|t|)	Significant Code
(Intercept)	3413000000000	265500000000	12857	< 2e-16	***
x1	-872	570	-1530	0.129289	
x2	82420	54250	1519	0.132056	
x3	10700	14370	1	0.458658	
x4	3516	699	5032	2.29e-06	***
x5	581	522	1113	0.268560	
x6	-117	150	-0.779	0.438202	
x7	-110	173	-0.636	0.526408	
x8	9	1504	0.006	0.995134	
x9	346000	190700	1814	0.072794	.
x10	1511	939	1610	0.110636	
x11	665	534	1245	0.216016	
x12	1449	432	3357	0.001134	**
x13	42530	12040	3534	0.000634	***
x14	10570	4363	2422	0.017311	*
x15	2349	1431	1642	0.103952	
x16	-603	221	-2733	0.007489	**

Formula

$y = 3413000000000 - 872 x_1 + 82420 x_2 + 10700 x_3 + 3516 x_4 + 581 x_5 - 117 x_6 - 110 x_7 + 9 x_8 + 346000 x_9 + 1511 x_{10} + 665 x_{11} + 1449 x_{12} + 42530 x_{13} + 10570 x_{14} + 2349 x_{15} - 603 x_{16}$

Goodness of Fit

Residual standard error: 1.23e+09 on 95 degrees of freedom

Multiple R-squared: 0.6566

Adjusted R-squared: 0.5988 F-statistic: 11.35 on 16 and 95 DF p-value: 9.586e-16

Interpretation
- Maximum revenue is achieved if other variables are constant
- An increase of Rp1 spending will decrease revenue from ATL Promotion & Cashback by Rp872
- An increase of Rp1 spending will increase revenue from Channel Exploration by Rp82420
- An increase of Rp1 spending will increase revenue from Community Engagement by Rp10700
- An increase of Rp1 spending will increase revenue from CRM (Email, PN, In-app, BTL Promotion etc) by Rp3516
- An increase of Rp1 spending will increase revenue from Digital Marketing - Awareness by Rp581
- An increase of Rp1 spending will decrease revenue from Digital Marketing - Performance - (BAU and Retargeting Combination) by Rp117
- An increase of Rp1 spending will increase revenue from Digital Marketing - Performance - BAU by Rp110
- An increase of Rp1 spending will increase revenue from Digital Marketing - Performance - Retargeting by Rp9
- An increase of Rp1 spending will increase revenue from Digital Marketing - Retention by Rp346000
- An increase of Rp1 spending will increase revenue from Influencers by Rp1511
- An increase of Rp1 spending will increase revenue from Out of Home (OOH) by Rp665
- An increase of Rp1 spending will increase revenue from Referral by Rp1449
- An increase of Rp1 spending will increase revenue from SEO & ASO by Rp42530
- An increase of Rp1 spending will increase revenue from Social Media by Rp10570
- An increase of Rp1 spending will increase revenue from Sponsorship and Events by Rp2349
- An increase of Rp1 spending will decrease revenue from TV by Rp603,40
- All independent variables simultaneously affect the dependent variables shown from the F Statistics test p-value of < 0.05
- Variables that have a significant effect are CRM, Referral, SEO & ASO, and TV shown in significant code of 1 until 3 stars
- The error value is 1230000000 which is considered very high, as there is a trend element in the time series data which cannot be modelled directly with ordinary multiple linear analysis. The degree of the error value indicates the mismatch of the prediction model to the actual data that has been collected in the study. Error value can also be seen from the R2 square value of 0.5988. Meaning that 60% of revenue is influenced by the independent variables, while the rest are influenced by other variables outside this research. Pvalue of 9.586e-16 < 0,05 which indicates that variable x simultaneously or jointly affects variable y.
- The classical assumption test on this model aims to assess whether the data is fit for modelling.

The results of the classical assumption test are:

o **Jarque Berra test**. The results are as follows:

X-squared = 0.30359, df = 2, p-value = 0.8592

Based on the test results, the p-value > 0.05 indicates that the data is normally distributed o **Non-Multicollinearity test.** The results are as follows:

VIF value < 10 meaning that the independent variables only affect the dependent variable and does not affect other independent variables. Therefore, it will not cause bias in the prediction model

iii) Patterns of Marketing Response (Data Transformation)

Adstock

Adstock model is obtained by transforming the *y value* into natural logarithmic form while the *x value* is transformed using *lambda (λ) values* and spending uses the Vector Autoregressive (VAR) model. The VAR model was formed to determine the causal relationship between time periods where today's variable estimation is affected by the results of previous variable estimation, therefore the lambda from VAR model shows variable x and its correction with the present (x_t) and the past (x_{t-1}). A variable with negative lambda has to be excluded in the following calculations as it explains that the variable is unstable (increase of spending may or may not increase the revenue) and therefore can decrease the prediction accuracy. Negative lambda can also mean that the variable spending is a "special" or "rare" spending, or only several times a year. Community Engagement (x_3) does have a negative lambda value (-9,58), therefore, the following calculation will exclude this variable to align with the goal that is increasing revenue

Variable	Lambda Value
Revenue	
ATL Promotion & Cashback	0,63
Channel Exploration	0,18
Community Engagement	-9,58
CRM (Email, PN, In-app, BTL Promotion etc)	0,65
Digital Marketing - Awareness	0,71
Digital Marketing - Performance - (BAU and Retargeting Combination)	0,86
Digital Marketing - Performance – BAU	0,93
Digital Marketing - Performance – Retargeting	0,92
Digital Marketing - Retention	0,84
Influencer	0,39
Out of Home (OOH)	0,80
Referral	0,80
SEO & ASO	0,85
Social Media	0,13
Sponsorship and Events	0,70
TV	0,70

Diminishing Return

Variable	Coefficient	Std. Error	t value	Pr(>|t|)	Significant Code
(Intercept)	9.244000000000	1.42E-02	653.307	<2e-16	***
trend	0.005467000000	1.98E-04	27.606	<2e-16	***
ad1	0.000000000018	2.89E-11	0.637	0.5258	
ad2	0.000000021130	9.45E-09	2.235	0.0278	*
ad3	-0.000000000057	3.88E-11	-1.46	0.1476	
ad4	-0.000000000003	2.33E-11	-0.134	0.8933	
ad5	0.000000000009	5.25E-12	1.798	0.0754	.
ad6	0.000000000014	5.98E-12	2.329	0.0223	*
ad7	0.000000000038	4.75E-11	0.794	0.4291	
ad8	0.000000007344	7.25E-09	1.013	0.3138	
ad9	0.000000000104	7.70E-11	1.355	0.1788	
ad10	0.000000000021	2.11E-11	0.996	0.3218	
ad11	0.000000000001	1.01E-11	0.067	0.9464	
ad12	0.000000000440	4.85E-10	0.914	0.363	
ad13	0.000000002084	1.07E-09	1.954	0.0538	.
ad14	0.000000000051	7.42E-11	0.685	0.4952	
ad15	0.000000000022	1.04E-11	2.085	0.0397	*

$$y = trend + ad1.adstock + ad2.adstock + ad3.adstock + ad4.adstock + ad5.adstock + ad6.adstock + ad7.adstock + ad8.adstock + ad9.adstock + ad10.adstock + ad11.adstock + ad12.adstock + ad13.adstock + ad14.adstock + ad15.adstock$$

Residual standard error: 0.03895 on 95 degrees of freedom
Multiple R-squared: 0.9654
Adjusted R-squared: 0.9596
F-statistic: 165.6 on 16 and 95
DF p-value: < 2.2e-16

Interpretation

- Maximum revenue is achieved at 9,24% if other variables are constant
- Changes in trend indicate an increase of weekly revenue by 0,5%
- An increase of Rp1 spending will increase revenue from *Adstock_ATL Promotion & Cashback* by 0.000000000018%
- An increase of Rp1 spending will increase revenue from *Adstock_Channel Exploration* by 0.000000021130%
- An increase of Rp1 spending will decrease revenue from *Adstock_CRM (Email, PN, In-app, BTL Promotion etc.)* by 0.000000000057%

- An increase of Rp1 spending will decrease revenue from *Adstock_Digital Marketing - Awareness* by 0.000000000003%
- An increase of Rp1 spending will increase revenue from *Adstock_Digital Marketing - Performance - (BAU and Retargeting Combination)* by 0.000000000009%
- An increase of Rp1 spending will increase revenue from *Adstock_Digital Marketing - Performance - BAU* by 0.000000000014%
- An increase of Rp1 spending will increase revenue from *Adstock_Digital Marketing - Performance - Retargeting* by 0.000000000038%
- An increase of Rp1 spending will increase revenue from *Adstock_Digital Marketing - Retention* by 0.000000007344%
- An increase of Rp1 spending will increase revenue from *Adstock_Influencers* by 0.000000000104%
- An increase of Rp1 spending will increase revenue from *Adstock_Out of Home (OOH)* by 0.000000000021%
- An increase of Rp1 spending will increase revenue from *Adstock_Referral* by 0.000000000001%
- An increase of Rp1 spending will increase revenue from *Adstock_SEO & ASO* by 0.000000000440%
- An increase of Rp1 spending will increase revenue from *Adstock_Social Media* by 0.000000002084%
- An increase of Rp1 spending will increase revenue from *Adstock_Sponsorship and Events* by 0.000000000051%
- An increase of Rp1 spending will decrease revenue from *Adstock_TV* by 0.000000000022%
- Although CRM (Email, PN, In-app, BTL Promotion etc.), Digital Marketing - Awareness, and TV are showing a negative impact in revenue, however these channels do have another agenda which focus on long-term brand equity and awareness, rather than Revenue only. Therefore, cost cutting in these channels required qualitative knowledge from the Marketing team for further evaluation.
- Variables that have a significant effect are *trend, 2, and ad15*; shown in significant code of 1 until 3 stars, indicates the importance of this variables in increasing weekly revenue when there are elements of trend and budget allocation
- All independent variables simultaneously affect the dependent variables shown from the F Statistics test *p-value* of < 0.05
- The error resulting from model 2 is 4%. The decreasing error value indicates that the existence of trends and budget allocations can increase the accuracy of forecasting errors, compared to the model without trends and budget allocations.
- The error value is 1041000000000 and with adjusted R2 of 0.7124. Meaning that 71% of revenue is influenced by the independent variables, while the rest are influenced by other variables outside this research. P-value of 2.2e-16 < 0,05 which indicates that variable x simultaneously or jointly affects variable y.
- R2 square value of 96%, meaning that 96% cause of increase in revenue is based on the independent variables and remaining 4% is influenced by other variables outside the research

iv) Time Series Decomposition

This figures explains the decomposition of revenue data pattern into trend, seasonality, and random (residual)

Decomposition of additive time series

Formula

ts_revenue = trend + season + ad1.adstock + ad2.adstock + ad3.adstock + ad4.adstock + ad5.adstock + ad6.adstock + ad7.adstock + ad8.adstock + ad9.adstock + ad10.adstock + ad11.adstock + ad12.adstock + ad13.adstock + ad14.adstock + ad15.adstock

Goodness of Fit

Residual standard error: 0.02462 on 44 degrees of freedom

Multiple R-squared: 0.9936

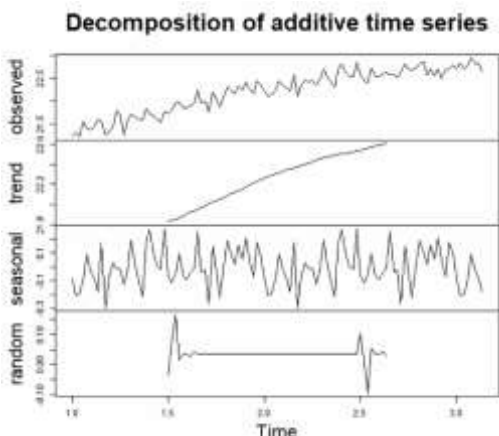Adjusted R-squared: 0.9838 F-statistic: 101.8 on 67 and 44 DF p-value: < 2.2e-16

Interpretation:
- Based on the trend decomposition, the change in revenue occurs by 1% for each week which indicates an increase.
- Based on the seasonal decomposition which shows changes in revenue every week for each year, there are repeated decreases in week 2,3,15,19,20,23,24,25,50 while the rest experience an increase in revenue every cycle of one year (seasonality)
- The significant variables that influence revenue, both trend and seasonal, can be seen from the *p-value* > 0,05. Therefore, these variables need to be prioritized in the budget allocation to increase revenue. *P-value* > 0,05 also means that the independent variables simultaneously or jointly affect the dependent variable.
- The decomposition model shows a greater R2 value compared to the model with and without trend and without a trend, which is 98%. It means that 98% of the independent variables can explain the dependent variable and the remaining 2% is explained by variables outside the research.
- The error value of the decomposition model shows a smaller value compared to the regression model with and without trend, which is 1%

Short Term ROI

Interpretation:
- In the short-term period, an increase in Adstock_ATL Promotion & Cashback by Rp1 will increase ROI by 0.000000000005561276%
- In the short-term period, an increase in Adstock_Channel Exploration by Rp1 will increase ROI by 0.000000006150205%
- In the short-term period, an increase in Adstock_CRM (Email, PN, In-app, BTL Promotion etc) by Rp1 will increase ROI by 0.00000000001480474%
- In the short-term period, an increase in Adstock_Digital Marketing - Awareness by Rp1 will decrease ROI by 0.00000000001700816%
- In the short-term period, an increase in Adstock_Digital Marketing - Performance - (BAU and Retargeting Combination) by Rp1 will decrease ROI by 0.00000000000488893%
- In the short-term period, an increase in Adstock_Digital Marketing - Performance - BAU by Rp1 will increase ROI by 0.00000000002968336%
- In the short-term period, an increase in Adstock_Digital Marketing - Performance - Retargeting by Rp1 will increase ROI by 0.0000000001605214%
- In the short-term period, an increase in Adstock_Digital Marketing - Retention by Rp1 will increase ROI by 0.00000001995009%
- In the short-term period, an increase in Adstock_Influencers by Rp1 will decrease ROI by 0.00000000003948446%
- In the short-term period, an increase in Adstock_Out of Home (OOH) by Rp1 will increase ROI by 0.00000000003486526%
- In the short-term period, an increase in Adstock_Referral by Rp1 will increase ROI by 0.000000000001319726%
- In the short-term period, an increase in Adstock_SEO & ASO by Rp1 will increase ROI by 0.0000000001785408%
- In the short-term period, an increase in Adstock_Social Media by Rp1 will increase ROI by 0.0000000001124379%
- In the short-term period, an increase in Adstock_Sponsorship by Rp1 will increase ROI by 0.00000000003040827%
- In the short-term period, an increase in Adstock_TV by Rp1 will increase ROI by 0.00000000001951317%

v) Long Term ROI

Interpretation
- Long term ROI increase in season 1 of each year after decrease of Rp 1 is Rp -4,85E-03%
- Long term ROI increase in season 2 of each year after increase of Rp 1 is Rp 2,22E-04%
- Long term ROI increase in season 3 of each year after increase of Rp 1 is Rp 1,97E-04%
- Long term ROI increase in season 4 of each year after increase of Rp 1 is Rp 2,51E-05%

- Long term ROI increase in season 5 of each year after increase of Rp 1 is Rp 6,87E-09, and the following can be referred from table

II. EVAM

EVAM calculation will be included in the Proposed Business Solutions

III. AARRR Framework

Category	User Action	Value	% Conversion
Acquisition	1st transaction	3873622	
Activation	1st transaction within 7 days	1022531	26%
Retention	3x transaction within 1 month	876313	23%
Referral	Existing users become referrer	731322	19%
Revenue	Free users become Paid Users	276665	7%

Author concluded that the conversion between Acquisition to Activation is too low (26%), meaning that the registered users required longer time to find their "aha" moment when they trying to understand the product value. However once users are activated, they are easier to move to the next stages. Therefore, the 2 required solutions based from the analysis above that are needed to be implemented right away are: (1) increasing the conversion from Acquisition to Activation, (2) increasing the conversion from Acquisition to Revenue

PROPOSED BUSINESS SOLUTION

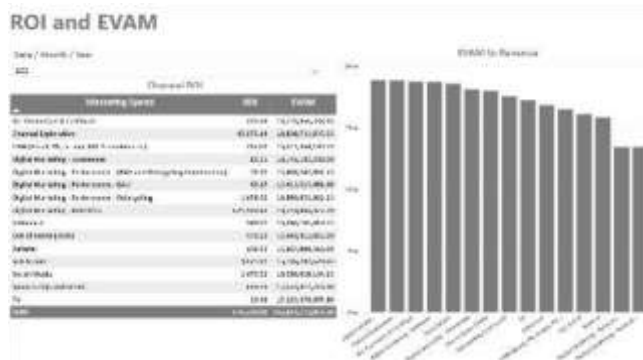### I. Marketing Mix Modelling
i) Building Visual Tool
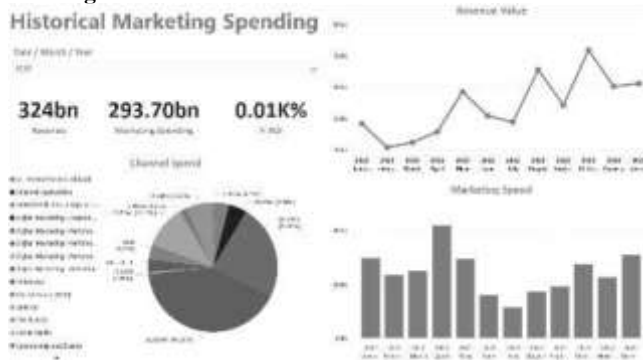
Page 1 - Historical Marketing Spending of 2022

Page 2 - Marketing Budget Recommendation for 2023

Page 3 - ROI and EVAM Contribution to Revenue for 2023

Page 4 - Forecasted Revenue of 2023

ii) Gaining Insights from Year 2022 (before MMM)

Revenue	Spending	ROI
323946399331	293,700,864,170.16	0.10

In 2022, the ROI from marketing is 10% which is considered very low and in need of action to increase the efficiency and effectiveness of all marketing spend. However, with PT ABC' "start-up" status, it is actually is acceptable by the management and investors, as long as the ROI is not negative (still producing profits)

From the analysis, it is known that Digital Marketing – Performance (BAU) is the biggest contributor of PT ABC 2022 revenue. Followed by Digital Marketing – Performance (BAU and Retargeting). Meaning that PT ABC's users are an avid digital users and an absorber of digital marketing content. This insight is useful to understand which of the marketing channel that are most contributing to revenue, and which are not. In this case, the lowest contribution came from Channel Exploration.

Marketing Channel	Spending	%
ATL Promotion & Cashback	2.921.065.803	0.99%
Channel Exploration	14.316.499.92	0.005%
CRM (Email, PN, In-app, BTL Promotion etc)	9.087.077.258,83	3.08%
Digital Marketing - Awareness	13.383.698.786,68	4.56%
Digital Marketing - Performance - (BAU & Retargeting Comb.)	69.070.391.817,55	23.52%
Digital Marketing - Performance - BAU	120.891.474.462,34	41.16%
Digital Marketing - Performance - Retargeting	1.310.417.084,55	0.45%
Digital Marketing - Retention	18.920.297	0.01%
Influencer	9.607.332.438,63	3.27%
Out of Home (OOH)	10.991.919.777,85	3.74%
Referral	28.721.030.016,25	10.12%
SEO & ASO	961.816.173,41	0.33%
Social Media	853.807.336	0.29%
Sponsorship and Events	5.443.824.725,77	1.85%
TV	19.441.771.694,43	6.62%
TOTAL	**293.700.864.170**	**100%**

iii) Marketing Re-Budgeting for 2023 (after MMM)

Marketing Budget for 2023

Year	Quarter	Marketing Spend	Historical Spend	Recommended Spend	Change	Year	Quarter	Marketing Spend	Historical Spend	Recommended Spend	Change	Year	Quarter	Marketing Spend	Historical Spend	Recommended Spend	Change
2023	Q2	ATL Promotion & Cashback	0	518105736	Increase 100%	2023	Q3	ATL Promotion & Cashback	752514022	890143822	Increase 18%	2023	Q4	ATL Promotion & Cashback	4080482451	2028842266	Decrease 50%
2023	Q2	Channel Exploration	0	3965388	Increase 100%	2023	Q3	Channel Exploration	0	4295837	Increase 100%	2023	Q4	Channel Exploration	0	4295837	Increase 100%
2023	Q2	CRM (Email, PN, In-app, BTL Promotion etc)	0	598704564	Increase 100%	2023	Q3	CRM (Email, PN, In-app, BTL Promotion etc)	0	648596611	Increase 100%	2023	Q4	CRM (Email, PN, In-app, BTL Promotion etc)	256807920	729685341	Increase 184%
2023	Q2	Digital Marketing - Awareness	601159576	1444145652	Increase 140%	2023	Q3	Digital Marketing - Awareness	2230388664	2632266048	Increase 18%	2023	Q4	Digital Marketing - Awareness	4234563951	3536533689	Decrease 16%
2023	Q2	Digital Marketing - Performance - (BAU and Retargeting Combination)	5799852257	6892149836	Increase 19%	2023	Q3	Digital Marketing - Performance - (BAU and Retargeting Combination)	11403376428	12268690398	Increase 8%	2023	Q4	Digital Marketing - Performance - (BAU and Retargeting Combination)	41824567657	36433771195	Decrease 13%
2023	Q2	Digital Marketing - Performance - BAU	60482984	1341295536	Increase 2118%	2023	Q3	Digital Marketing - Performance - BAU	19943457562	18152905837	Decrease 9%	2023	Q4	Digital Marketing - Performance - BAU	9896257069	12047750570	Increase 22%
2023	Q2	Digital Marketing - Performance - Retargeting	0	76358328	Increase 100%	2023	Q3	Digital Marketing - Performance - Retargeting	49558369	82721522	Increase 67%	2023	Q4	Digital Marketing - Performance - Retargeting	2444260283	2091620614	Decrease 14%
2023	Q2	Digital Marketing - Retention	0	285912	Increase 100%	2023	Q3	Digital Marketing - Retention	0	309738	Increase 100%	2023	Q4	Digital Marketing - Retention	0	309738	Increase 100%
2023	Q2	Influencer	27007036	934846996	Increase 3361%	2023	Q3	Influencer	149660591	1050648053	Increase 602%	2023	Q4	Influencer	1757666030	1652786133	Decrease 6%
2023	Q2	Out of Home (OOH)	0	350929740	Increase 100%	2023	Q3	Out of Home (OOH)	0	380173685	Increase 100%	2023	Q4	Out of Home (OOH)	54000000	423569733	Increase 684%
2023	Q2	Referral	3785726	803294467	Increase 21119%	2023	Q3	Referral	32044463	869013266	Increase 2612%	2023	Q4	Referral	4085184698	3673800682	Decrease 10%
2023	Q2	SEO & ASO	0	23664096	Increase 100%	2023	Q3	SEO & ASO	0	25636104	Increase 100%	2023	Q4	SEO & ASO	70682630	82564318	Increase 17%
2023	Q2	Social Media	0	112679796	Increase 100%	2023	Q3	Social Media	37990132	126980862	Increase 234%	2023	Q4	Social Media	179118734	141684429	Decrease 21%
2023	Q2	Sponsorship and Events	0	256389696	Increase 100%	2023	Q3	Sponsorship and Events	0	277755504	Increase 100%	2023	Q4	Sponsorship and Events	0	277755504	Increase 100%
2023	Q2	TV	3180063735	4117473784	Increase 29%	2023	Q3	TV	9003108739	7897434629	Decrease 12%	2023	Q4	TV	6352063064	6446796556	Increase 1%

ROI and EVAM Contribution for Revenue of 2023

Year	Quarter	Marketing Channel	ROI	EVAM	Year	Quarter	Marketing Channel	ROI	EVAM	Year	Quarter	Marketing Channel	ROI	EVAM
2023	Q2	ATL Promotion & Cashback	12386%	Rp 6.365.492.545	2023	Q3	ATL Promotion & Cashback	7168%	Rp 6.291.883.735	2023	Q4	ATL Promotion & Cashback	3090%	Rp 6.066.588.959
2023	Q2	Channel Exploration	1581351%	Rp 6.270.273.750	2023	Q3	Channel Exploration	1463082%	Rp 6.284.730.093	2023	Q4	Channel Exploration	1463082%	Rp 6.284.730.093
2023	Q2	CRM (Email, PN, In-app, BTL Promotion etc)	9233%	Rp 5.468.153.907	2023	Q3	CRM (Email, PN, In-app, BTL Promotion etc)	8576%	Rp 5.497.640.832	2023	Q4	CRM (Email, PN, In-app, BTL Promotion etc)	7700%	Rp 5.545.565.451
2023	Q2	Digital Marketing - Awareness	4350%	Rp 6.136.949.667	2023	Q3	Digital Marketing - Awareness	2394%	Rp 6.039.255.151	2023	Q4	Digital Marketing - Awareness	1787%	Rp 5.964.900.743
2023	Q2	Digital Marketing - Performance - (BAU and Retargeting Comb.)	926%	Rp 5.690.335.164	2023	Q3	Digital Marketing - Performance - (BAU and Retargeting Comb.)	518%	Rp 5.126.437.276	2023	Q4	Digital Marketing - Performance - (BAU and Retargeting Comb.)	171%	Rp 2.591.975.222
2023	Q2	Digital Marketing - Performance - BAU	3506%	Rp 4.568.091.754	2023	Q3	Digital Marketing - Performance - BAU	342%	Rp 4.390.457.883	2023	Q4	Digital Marketing - Performance - BAU	470%	Rp 4.454.965.824
2023	Q2	Digital Marketing - Performance - Retargeting	84740%	Rp 6.462.973.303	2023	Q3	Digital Marketing - Performance - Retargeting	78210%	Rp 6.461.338.874	2023	Q4	Digital Marketing - Performance - Retargeting	2942%	Rp 5.945.339.706
2023	Q2	Digital Marketing - Retention	21820936%	Rp 6.238.841.488	2023	Q3	Digital Marketing - Retention	20146223%	Rp 6.240.022.495	2023	Q4	Digital Marketing - Retention	20146223%	Rp 6.240.022.495
2023	Q2	Influencer	5710%	Rp 5.244.263.331	2023	Q3	Influencer	5239%	Rp 5.398.906.668	2023	Q4	Influencer	3853%	Rp 6.203.015.411
2023	Q2	Out of Home (OOH)	17180%	Rp 5.994.049.394	2023	Q3	Out of Home (OOH)	15874%	Rp 5.996.995.973	2023	Q4	Out of Home (OOH)	14269%	Rp 6.001.368.448
2023	Q2	Referral	6367%	Rp 5.034.472.562	2023	Q3	Referral	5913%	Rp 5.051.516.098	2023	Q4	Referral	1673%	Rp 5.778.910.658
2023	Q2	SEO & ASO	219663%	Rp 5.195.771.451	2023	Q3	SEO & ASO	203428%	Rp 5.212.548.883	2023	Q4	SEO & ASO	69099%	Rp 5.696.882.246
2023	Q2	Social Media	53749%	Rp 6.045.202.539	2023	Q3	Social Media	48889%	Rp 6.195.231.205	2023	Q4	Social Media	44914%	Rp 6.349.482.401
2023	Q2	Sponsorship and Events	22900%	Rp 5.845.575.677	2023	Q3	Sponsorship and Events	21213%	Rp 5.864.218.518	2023	Q4	Sponsorship and Events	21213%	Rp 5.864.218.518
2023	Q2	TV	1574%	Rp 6.069.470.800	2023	Q3	TV	792%	Rp 5.461.366.672	2023	Q4	TV	983%	Rp 5.694.739.195

iv) Forecasted Revenue of 2023 (after MMM)

If PT ABC is taking all the recommendation above as it is, below is the calculation of annual revenue the company will receive by the endof each quarter

The %ROI after MMM method increase from **0,1** to **19,57** after budget recommendation by MMM

Year	2023	2023	2023	TOTAL
Quarter	Q2	Q3	Q4	
Total Spend	17474289527	45307572116	69571766605	132.353.628.248
Base Revenue	7295555556	7295555556	7295555556	21.886.666.667
Incremental Revenue	883773462821	900433075670	916398820299	2.700.605.358.791
Total Revenue	891069018377	907728631226	923694375855	2.722.492.025.458
ROI	49,58	18,87	12,17	19,57

II. AARRR Framework

Below is the business solutions for increasing the AARRR conversation rate based on Customer Journey Map

Acquisition

1) Gain deeper understanding of who is the target market

   Conduct a deeper research on the consumer behaviour and lifestyle of PT ABC's current target market. Focus to build the specific user personas to help communicate more efficient and effectively. Also, gain insight of where the users are coming from and how is their digital usage patterns.

2) Increasing app visibility through marketing activities

   • SEO and SEM is an important channel as it allows companies become more visible, particularly on Google. When a user finds the service (from website or app) through Google, it is a great first touchpoint to move a user toward the activation stage. To optimize SEO and SEM, ensure that the title is eye-catching to attract visits

   • Organic and paid direct marketing through social media to gain visibility and traction for the brand.

   • Organize social events or sponsorships to increase brand awareness and popularity

   • Contextual and targeted advertising aimed to increase app downloads or drive traffic to the app.

   • Integrated advertising with the platform of influential figures or key opinion leader (KOL)

3) Reduce the complexity of registration and onboarding process

   • Build a simple efficient flow of registration and data verification process

   • Build a complete thorough FAQ page in Bahasa and English for users to access guidance on how to use the app at any time. Utilize tutorial videos as it is easier for new users to onboard

   • Provides 24 hours consumer support for any issue in transaction

   • Identify when users gave up on during the onboarding process as it indicates the areas where they experiencing confusion or problems

4) Utilize push notifications for users who download the app and register but never transact

Activation

Find out where and when is the product's "aha" moment

   • The goal of Activation is to deliver an exceptional customer experience. Therefore, it is essential to understand when and where users realize the product value for the first time, and build the strategy from there. The longer the "aha moment" is found, the more likely the user is going to churn. The "aha" moment can be pushed through the Onboarding Process, by reducing the complexity and emphasizing on business solutions PT ABC tries to deliver

Retention

1) Maintain the product stability

   • Ensure the UI/UX flow to be easy-to-understand, simple, and well organized even with every ongoing product development in the app

   • Frequent system maintenance to unsure product remain stable and consistent, therefore users will understand the value of integrity PT ABC tries to deliver. This will increase customer trust and favourability.

2) Hearing feedback for further improvements

• Taking frequent satisfaction surveys is a useful way not only to evaluate the current product delivery, but also gaining insights of what to improve next based on users' needs.

3) CRM for retention strategy

To keep the retention rate high, Author recommends to focus on CRM activities. Sending valuable emails with personal touch on a regular basis. This activity aims to help users grasp the advantages of using the, minimizing churn, and moving users closer to becoming paying customers.

4) Emphasise the uniqueness or product value that PT ABC delivers

• Discover and continuously evaluate the key feature – the feature that attracts users to keep returning to the app. It might be a core feature or the "wow" or "satisfier" feature. These feature is expected to have a high level of both activation and retention.

• CRM (email newsletter, push notifications) showcasing the new app improvements along with its practical benefits

5) Offer price promotions from time to time to increase the usage

6) Digital marketing and social media contents, announcing upcoming events and promos

Referral

1) Email marketing with referral promo embedded

2) Find out users' product favourite feature, and emphasize it in marketing contents that is strategized for increasing Referral rate

3) Developing referral program from the Membership Club

4) Giving referral bonus program for the Referrer. The more frequent a referral code is used, the more bonus a Referrer deserves

Revenue

1) Build a good membership package and promotion programs to attract free users to upgrade

2) Emphasize the solutions and advance functionary of the paid package

3) Developing a PT ABC Membership Club, a membership for the paid package users to gain partnerships towards other microentrepreneur for knowledge sharing and business networking

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