

Engineering an Investment; A Financial Approach to Engineering Businesses

Ezurike Benjamin. O, Department of Mechanical Engineering, Federal University of Technology
P.M.B 1526, Owerri, Imo State
E-mail: ben4oke2000@yahoo.com

Okoronkwo Chukwunenye . A, Department of Mechanical Engineering, Federal University of Technology
P.M.B 1526, Owerri, Imo State
E-mail: orujeks1@gmail.com

Okwu Modestus. O, Department of Mechanical Engineering, Federal University of Technology
P.M.B 1526, Owerri, Imo State

Abstract - In a bid to make a difference in the service industry, XRIKE decided to embark on an innovative approach that would satisfy and add value to the customers. This project was done to ascertain the profitability of a business venture and things to be considered before going into the food business. Some of the factors include; rates of returns, investment appraisals, payback periods, cash flows to mention but a few. The purpose of the proposed business is to provide food services to customers, create employments, and provide an innovative approach to meeting customer's food demands, making profits while satisfying them optimally without quality being compromised. This paper dealt with so many questions an investor should ask before embarking on any investment, provided some examples and some calculations for investment analysis and conclusions.

Keywords: *Engineering business, Investment appraisal, Payback period, Rate of return.*

1. Introduction

How do I outperform rivals and add value to customers?,

As he watched closely, the service method in a good cafeteria in an old city of Owerri, Nigeria, XRIKE saw hunger in the eyes of the customers who were in a queue, waiting to be attended to. The waiters operated in a manner that people were served one after the other, dishes washed, while the other people in the queue, waited to be served with the same dishes. Could there be another innovation, instead of queuing endlessly, make it a *takeaway* service? This was the question that struck on the mind of XRIKE before considering going into a new business which its sole aim is to make up for the deficiencies and inability of the food service industries in delivering on time and satisfying its customers. They had made several inquiries on how this business would run and the cost of setting-up this busi-

ness. Firstly, there's need for XRIKE to be registered with the government and the food and beverage manufacturing organizations, with whom he would operate under their Umbrellas. It was important for him to make a very good first impression, which made him consider first the marketability of the business and the **investment returns**. He had to monitor the business processes of others that began first, then devise means on how to start and become competitive. He started by making investment appraisals. So many questions were to be answered by XRIKE, the initiator of the business venture. Some of the questions include; How marketable is this business?, how much does it cost to go into this business? Would they make a profit at the end of the day?, how do they make it right the first time, then remain competitive? In a bid to answer these questions, a list of food items that are always wanted by customers were outlined.

In order to have a competitive advantage over rivals, XRIKE (The proposed business name) decided to concentrate on one special food item that the Company would go into. He finally resolved to go into the special sealed meal (packaged rice) service known as *takeaway* meals. This packaged food item is prepared and packaged in an attractive way to entice customers. The former system was for to be in a queue, collect their food, sit down and eat. But this innovative idea of presenting the same food, improved service quality, but

Corresponding Author

Ezurike Benjamin. O, Department of Mechanical Engineering, Federal University of Technology
P.M.B 1526, Owerri, Imo State
E-mail: ben4oke2000@yahoo.com

different packaging and services, would give XRIKE a core competence that would make their business, the talk of the town. XRIKE has estimated the total cost of setting up this business and has seen that the business would require certain costs like; **variable cost, overhead / fixed costs.**

Variable costs are costs that could change with time, depending on the changes in the market and varying output level. Examples of this cost are; raw material costs, costs of fuelling the power generating set. Fixed costs remain unchanged. Example are loans, salaries. Overhead costs include the general cost of running the entire business including transportation and logistics. XRIKE hopes to add value to customers by constantly meeting their needs and maintaining quality. The company hopes to generate revenue from the food business and with respect to this, would do its best to retain customers by constantly meeting their food needs and providing adequate and affordable services. The company hopes to remain competitive and have a long term goal of becoming a leader in the food service industry. It also hopes to create employments by extending to other places while aiming at reach an uncompromised customer satisfaction.

2. Literature Review

2.1. Purpose of Investment:

The major purpose of this proposed investment is to reach out and satisfy customers' food demands. Investment appraisal is an important tool when trying to go into any business. If you don't appraise and know the valuability of the business, the costs required and other logistics, you'll definitely end up not meeting the aim of the business. In business appraisal, so many factors are considered like; the payback period, return of investment, funding, and so on. Investment purpose is mainly for job creations (November 4, 2008. Economic Policy online). In payback period, certain factors should be considered to know if the investment would yield enough returns as to be able to pay back the money borrowed as at when due. The length and period of time that are needed to pay back or cover the cost that was used for an investment is highly important in any investment undertakings (Brigham and Houston 10th edition page 395). Return on investment has to do with the expected returns on the investment.

Did I meet my target? Having a projection on how the business should run, goes a long way in determining if the business would thrive or not. In this business proposal, XRIKE intends having a monthly performance review (MPR) in which at the end of the month, sits with the management of the business to know the areas the business didn't measure up, and to project future performance in the subsequent months (Thomas F. Patterson, 1987) This monthly review would also enable this business owner calculate how much was invested and how much it yielded. For example, XRIKE targets 50 new customers every month and one of the strategies would be to discuss with highway bus drivers to make XRIKE their eating point, which would automatically make hungry passengers become XRIKE's customers.

Would this return, enable me go further in investing? The targeted customers if met, would enable the Company know if it should further strengthen this investment by having branches in other strategic places of the Country. Fifty (50) new customers every month means that the Company would need new and competent employees, which was one of the major aims of XRIKE (to create jobs). From the already made forecasts, and if all things work as planned, this business would be highly profitable and also requires a lot of commitments by the management and staff. These questions were addressed by XRIKE and he was convinced that if properly followed, would outperform rivals and in return, add value to customers. Another important factor to consider, apart from payback period and the investment appraisal is the funding of the business (Modigliani, F., Miller, M. (1958) this requires the investor, knowing how much he/ she can contribute to the business (Equity) and how much he intends borrowing from the Bank or any other funder (Debt).

Examples of costs and revenues	Total costs in million (Naira)	Total revenue in Million (Naira)
Variable		
Labor	2	
Raw materials	1.5	
Energy	0.5	
Total	4	
Fixed		
Administration	1	
Marketing	0.5	
Total	1.5	
	5.5	7

Table 1: Break Down of the investment appraisal and costs that are likely to be incurred. (Estimated figures. Interpretation

and Application of International Financial Reporting Standards. John Wiley & Sons. Page. 91–97)

The analysis of the required revenue was ascertained from the estimated total costs of going into this business. A total of N5.5 for both variable and fixed costs would be incurred, and since every business is subject to uncertainties and unforeseen circumstances, a further N1.5 should be Banked to meet whatever need that arises, bringing the total revenue to be N7(all in million Naira).

Note: *labor costs* include, cost of constructing the building where the food cafeteria would take place, paying of subcontracted laborers, etc. Raw material costs include; cost of ingredients like vegetable oil, tomatoes, bags of rice. While energy costs involves, the generating set in case of power failures, electric bills, cost of maintenance of the sets.

Fixed costs are broken down as follows;

Administration: Day to day running of the business, including logistics, cost of photocopying of business materials, phone calls.

Marketing: costs incurred in sourcing for new customers.

Revenues (N7) : 40% equity and 60% debt. Which means that XRIKE would contribute an equity financing of 2.8 million, while the remaining 4.2 million, would be borrowed from the Bank to be paid over time.

Should I invest?

Having seen that customer satisfaction was lacking in the competitor's method of food services, XRIKE found a reason for this investment which was deemed necessary if it must meet customers' food demands. It was found that the demand for such kind of packaged foods would be very high due to the fact that there won't be any need for hungry customers to queue up for services, and this method is very hygienic. All these, made XRIKE decide it was time to make an innovative approach towards meeting these demands which would definitely yield returns while satisfying and retaining its customers. For XRIKE to remain competitive in its dealings, the Company must be very **sensitive** to price without compromising quality, this could be done by ensuring that its packaged food are

prepared in a clean and well serviced environment and would also be affordable to the common man. For this quality to be achieved, the Company intends to register with the International Standard Organization (ISO), which would from time to time, monitor the activities of the Company to ensure that the goods and services are of standard.

There's also plans for sending its chef in training to ensure no stone is left unturned in making its services the best. The XRIKE's profit would be measured by the difference between its sales revenue and its direct costs of production. Deducting fixed costs from the gross profits, gives the other common measure of the net-profit. The time duration is of the essence in investment and its appraisal. (Brigham and Houston 10th edition, page 285). Is it the ripe time to invest? What about our competitors, have we benchmarked them to know if we could actually compete? In order to be successful in this undertaking, these factors must be adequately considered.

Let us look at some important calculations of the expected revenue and costs. Note: forecast cost = N5.5, and expected Revenue = N7. Remember that the revenue is gotten from 40% equity, and 60% debt as stated earlier. We shall now look at the gross profit, gross profit margin, net profit, net profit margin.

Gross Profit = Total Revenue – Total variable costs

i.e. $N7 - N3 = N4$. From table above

Gross profit Margin = gross profit / revenue x 100

$= 4 / 7 \times 100 = 57\%$

Net Profit = Total Revenue – Total costs (variable and fixed costs)

i.e. $N7 - N5.5 = N1.5$

Net Profit margin = Net Profit / Revenue x 100

i.e. $N1.5 / 7 \times 100 = 21.4\%$

2.2. Projected Cash Flow Analysis :

In order for the company to remain profitable in this proposed business, there's a need to evaluate the expected financial benefits of this investment and decide if the business is worth going into. Statement of Cash flows is very important in ensuring that the investment is worth going into. It operates on the basis of knowing the firm's financial standings and then making investment decisions. (Scoth Besley, Eugene Brigham, page 91). Cash flows, help in answering questions, how much debt financing do we need for this project? How

and when do we intend to pay back? Consider the table below of XRIKE's predicted cash flow.

The table shows the expected cash inflow and outflow of the two major machineries (Water treatment plant and power generating machine), that XRIKE would constantly maintain if the business must adequately run. This projection would be for a period of 3 years and thus cumulative cash flows would be calculated to determine if there could be reduced in maintenance and service costs.

Table 2: Estimated figures. The Cash Flow Statement". *Financial Analysis - Tools and Techniques*

Year	Cash outflow		Cash inflow		Net cash flow		Cumulative cash flow	
	Generators	Water treatment plant	Generators	Water treatment plant	Generators	Water treatment plant	Generators	Water treatment plant
0	0.5	0.25	0	0	0.5	0.25	0.5	0.25
1	0.1	0.03	0.32	0.20	0.22	0.17	0.28	0.08
2	0.1	0.03	0.35	0.07	0.25	0.04	0.03	0.04
3	0.1	0.04	0.11	0.07	0.01	0.03	0.02	0.01

The calculations are as follows; **(Estimated figures.** The Cash Flow Statement". *Financial Analysis - Tools and Techniques - A Guide for Managers.* McGraw-Hill. p. 42

Net Cash Flow of Generator = Cash Inflow of Generator – Cash Outflow of generator

For the year 1, we have that $0.32 - 0.1 = 0.22$ (all cash flows in million Naira)

Also, for water treatment plant, the same calculation goes

i.e. Net cash flow of water treatment plant = cash inflow – cash outflow

$$= 0.20 - 0.03 = 0.17.$$

To calculate the cumulative cash flow, we have

For generator, net flow of year 0 – net flow of year 1 = $0.5 - 0.22 = 0.28$

$$\text{Year 2: } 0.28 - 0.25 = 0.03$$

$$\text{Year 3: } 0.03 - 0.01 = 0.02.$$

For water treatment plant,

$$\text{Year 0: } 0.25 - 0.17 = 0.08 \text{ (year 0 – year 1)}$$

$$\text{Year 2: } 0.08 - 0.04 = 0.04$$

$$\text{Year 3: } 0.04 - 0.03 = 0.01$$

The calculations above, would enable the intending investor to know how the budget for the investment should look like. It also helps to analyze the expected cash that would enable the business run efficiently without interruption.

Why should I appraise?

Business appraisal is very important in a bid to starting a new business. Why should I go into this business? What is my expected return rate? Would there be profits at the end of the day? What about the payback period? These questions are what we call a business appraisal. They help an investor to know how valuable the business would be, the costs of venturing into it, the expected profit and loss, and most importantly, the economic value it would add (Philip McArthur online)

2.3. Net Present Value: This is known as the difference of the present values (PVs) of the individual cash flows. Similarly, we define the net present value of a project or investment as the difference between the present value of its benefits and the present value of its cost. The NPV analysis should be done accurately (Lawrence D. Schall, Charles W. Haley) in another to be certain of the worth of each investment, both in the present, and in the future.

Net present value (NPV) = PV (Benefits) – PV (Costs).

For example, assuming XRIKE had an investment opportunity in which the Company will receive N10,000 today in exchange for paying N10,500 in one year. If the risk-free interest rate is 9% per year, we shall consider if this investment is a good idea.

Solution:

The benefit of N10,000 is already in PV terms. The cost, however, is in terms of Naira (Nigerian currency) in one year. We, therefore, convert it at a risk-free interest rate:

$$PV(\text{Cost}) = (\text{N}10,500 \text{ in one year}) / (1.09 \text{N in one year} / \text{N today}) = \text{N}9633.02$$

$NPV = N10,000 - 9633.02 = N366.98$
today. The NPV is positive, so the investment is a good idea. Undertaking this investment is like gaining an extra N366.98 at hand today

2.4. The rate of Return: How much am I expecting at the end of the day and how do I achieve this? XRIKE's business model is to minimize the costs of operating the business and maximize profits, while ensuring that the customers are satisfied. In a bid to achieve this, XRIKE has a plan to run this business on a 24 hour, 7 days a week, which means that the business intends to run continuously, since it is located in a day and night business environment. The business also intends making a net profit of 55% on a monthly investment.

2.5. An Investment that Lasts

For any Business to thrive, it needs a long term plan. The Management of the Business, the customers, the shareholders, all play very important roles in ensuring that every necessary tool; human, technological, financial and material resources are put in place. Furthermore, environmental factors must be accounted for and all resulting risk, visualized to ensure that appropriate forecasts and control measures are made.

It is not enough to have an investment, but how to invest, add value and make it last is an important issue. The investment appraisal as we said earlier, must be appropriately done. Furthermore, return rates, risks involved in doing the business, projection of future performance of the business must be considered, and benchmarking competitors to know and improve the process are factors that cannot be over emphasized.

3. Conclusion

In conclusion, following the analysis made in undertaking this business, one could say that the reward in venturing into this business, is worth the risk. Since XRIKE's business approach or system is to make profit with minimum cost, while satisfying the customers optimally and maintaining quality, it must take into consideration certain factors that would inhibit the business performance.

Certain forecast both in material, demand, supply, environmental, government and all other risks and uncertainties should be made to ensure the business runs smoothly. Furthermore, various costs such as set-up and maintenance should be calculated to ensure

the organization does not end up at a loss.

Meaning of terms:

XRIKE: Proposed business name

NPV: Net Present Value

RT: Rate of Returns

PV: Present Value

CF: Cash Flow

FV: Future Value

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