The 2nd International Conference on Education Innovation and Social Science, July 2023
ISSN (Online): 2961-9602

FINANCIAL FEASIBILITY OF BUSINESS ON TOY STARTUP: A CASE STUDY OF CODY KIT

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Keyword

Financial Feasibility, Coding, Coding-Based Learning Toy

Abstract

Coding and computer science has been a hot topic lately, and according to OECD estimates, approximately 10 billion jobs around the world are likely to be transformed by technology in the next decade. Coding and computer science are nominated as the essence of our future, as we are slowly arriving to an era where technology is a daily part of most of our lives. In spite of that, 825 million children worldwide are still not learning the skill they essentially need, including computer science. Cody Kit is a startup company who will become the answer to the problems. Cody Kit is a startup company which innovates a coding-based learning toy that integrates physical products with programming systems based on visual block games. The kit is concepted as an educational product that applied a step-by-step and coding-based learning method. However, Cody Kit hasn't done a financial feasibility study. The purpose of this research is to conduct a financial feasibility study for the development of Cody Kit where it uses a quantitative approach with company data as primary data and similar company data as secondary data. The financial feasibility will be analyzed by calculating the payback period, net present value (NPV), and the internal rate of return (IRR) then the risk will be assessed using scenario analysis. The results show that Cody Kit is financially feasible with a payback period of 2.821 years, with NPV of Rp21,175,355, and an IRR of 16.05% which is far greater than the WACC, which is 9.29%.

INTRODUCTION

According to OECD estimates, more than one billion of all jobs worldwide are likely to be transformed by technology in the next decade (World Economic Forum, 2022). As we are slowly arriving in the future we see how much of technology is already applied in our daily lives and makes computer science nominated as the essence of the future world. Meanwhile, 825 M children worldwide are not learning the skills they essentially need, including computer science (World Economic Forum, 2021). This is the fastest growing segment of jobs in the world, including in Indonesia. There is a growing focus on the generation of new sources of employment (World Bank, 2017), where that focus lies on those who are adaptable with technologies.

Cody Kit is a startup company which innovates a coding-based learning toy that integrates physical products with programming systems based on visual block games. The kit is concepted as an educational product that applied a step-by-step and coding-based learning method. Its complexity has been adapted to the age level and stages of children's growth. Children will also be guided coherently with guide books and tutorial videos. Cody Kit also has an activity book called Cody Play to instill computational thinking for earlier ages, that aren't compatible with screen time yet, but want to be given challenges to finish in order to stimulate their brain to be able to problem solve and think critically to solve a problem.

Based on the issue, market potential and emerging industries, Cody Kit exists as a step to reach a solution. Cody Kit provides a coding based learning toy that teaches children the essence

ISSN (Online): 2961-9602

of coding and computational thinking, in a fun way. Cody Kit's main product, which are the robots, are made out of arduino, a programmable component that determines the movement of the robot. Children who use the product from a young age are targeted to have the essential 21st century skills, such as critical thinking, problem solving, and digital literacy by clearing obstacles with the given tools. Cody Kit's programming app is similar to the application "Scratch," making the visual block style very simple to understand. Cody Kit's second line of product, Cody Play, is an activity book that teaches toddlers the roots and concept of computational thinking. The difference between the end result between the two products lies in the level of complex understanding and level of application of computational thinking in their education or daily lives.

1) Theoretical Foundation

a) Financial Statements

A financial statement is a written report that summarizes a company's financial performance and activities over a specific period. The three primary financial statements are income statement, balance sheet, and statement of cash flows (Gibson, 2009). Income statements is the financial statement that summarizes the company's operational performance over a certain time period that consists of revenues and expenses (Gibson,2009). Balance sheet provides information on the firm's productive resources and the financing used to pay for these resources (Clyde P. Stickney, 2019). Assets are the probable future economic gains that an entity will acquire or control as a result of previous transactions or occurrences. Tangible assets include property, plant, equipment, while patents and trademarks are examples of intangible assets, lacking physical substance but are extremely important to the company (Kimmel, 2008). While statement of cash flow reports information regarding cash gained or spent by different activities which are operating cash flows, investing cash flows, and financing cash flows (Gibson, 2009).

b) Financial Feasibility

Three most commonly used models to evaluate financial feasibility options include (1) the net present value method, (2) the internal rate of return methods, and (3) the payback (or breakeven) period methods. As NPV and IRR put time value of money, they provide the most realistic results which leads to better decision-making information (Miller, et al., 2017).

Payback Period

Payback period is the number of years needed to recover the initial investment of a project, as it measures how fast the project will return the original investment. However, it does not put time value of money nor does it discount the free cash flows back to the present. The decision criteria centers on whether the payback period is less or equal or bigger to the firm's maximum desired payback period (Keown, et al., 2005).

Net Present Value

The Net Present Value (NPV) is the result by subtracting a project's initial investment from the present value of its cash inflows discounted at a rate equal to the firm's cost of capital (Gitman & Zutter, 2015, p.449).

Internal Rate of Return

The internal rate of return is how much the firm will earn if the project's investment obtains the specified cash inflows (Gitman & Zutter, 2015, p.453). A single value is assigned to the IRR fundamental reason, which highlights the project's merits.

c) Cost of Capital

Cost of capital is the minimum rate of return required for the project to improve the firm's It is used to grade investment possibilities to identify the ones who will bring the most value. A rate of return above the cost of capital will raise the company's value, and vice versa. (Gitman & Zutter, 2015, p.410).

Cost of Equity

The return demanded by investors' equity on their investment in the firm is referred to as the cost of equity (Jordan, et al., 2019). The Capital Asset Pricing Model (CAPM) is a more objective method of estimating the cost of equity. CAPM does not rely on dividends and growth

ISSN (Online): 2961-9602

rate in dividends, thus can be applied to companies that do not pay dividends (Keown, et al., 2005).

Weighted Average Cost of Capital

The weighted average cost of capital (WACC) reflects the expected average future cost of capital over the long run. It is found by weighting the cost of each specific type of capital by its proportion in the firm's capital structure (Gitman & Zutter, 2015).

d) Internal Analysis

In the Internal Analysis section, the researcher will analyze the internal aspects of the Cody Kit company. Researcher will use Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis to be able to assess the strengths, weaknesses, opportunities, and threats that the company currently faces or might face in the future. The analysis of a case should not be overemphasized relative to the synthesis of results gained from the analytical efforts from a company (Hitt, et al., 2011). Researcher will use Technology Readiness Level (TRL) analysis to assess its technology capability to be presented to the customers. The TRL Scale uses a set of questions designed to measure progress of a technology toward maturity (U.S. Department of Transportation, 2021).

e) External Analysis

In the External Analysis section, the researcher will analyze the external aspects of the Coy Kit company by using Porter's Five Forces to analyze aspects of the macro and microenvironment in Cody Kit. Competitive positions could be thought of in terms of cost, differentiation, and scope (Porter, 2008)

f) Capital Budgeting Risk

Risk in capital budgeting is the degree of variability of cash flows, which for conventional capital budgeting projects stems almost entirely from net cash flows. Finding the breakeven cash inflow and the probability of realizing it is a necessity in assessing capital budgeting risk. Scenario analysis is an option for approaching for capturing the variability of cash inflows and NPVs (Gitman & Zutter, 2015).

Scenario Analysis

Scenario analysis is conducted in order to analyze the impacts of possible future events that might affect the project, and thus presenting different options for future developments. The worst-case, base-case, and best-case scenarios were created using a variety of potential alternative outcomes. The project is riskier the wider the range (Balaman, 2018).

METHOD

a) Data Collection

This research collected data by two methods, primary data and secondary data. Both methods will be used to fulfill the required assumption before analyzing the data.

b) Primary Data

Researchers will collect data from the historical data owned by Cody Kit company from the previous year, and the authors will also use data from companies in the same industries, for examples Planet Sains and Osmo. Primary data are data obtained specifically for a research issue using methods related to the problem (Hox & Boeije, 2005).

c) Secondary Data

The researcher can use relevant books, literature reviews, journals, and papers to gather and back up informations given. Secondary data consists of information about things that have been seen and whose attributes have been coded into variables with multiple values (Hox & Boeije, 2005).

d) Data Analysis

Data analysis is a step after the necessary datas are acquired then the data that has been acquire will then be analyzed using 4 stages. (1) Construct pro forma financial statements, (2) Calculate the cost of capital using WACC, (3) Conduct feasibility analysis, and (4) Risk

ISSN (Online): 2961-9602

assessment. The results are used assess the answers and provide decisions that need to be taken.

RESULTS

a) Current Business Stage

Currently, Cody Kit is in process of developing the product of programming-based toy kit alongside developing Cody Play, a coding-based activity book for children under 7 years old to instill the basics of computational thinking. Using the 24 steps disciplined entrepreneurs, Cody Kit has reached the 24th stage, which is in development of a product plan and product development in order to be more suitable for customers. Cody Kit has released a number of products and services called Cody Play and Cody Camp featuring the Cody Kit.

b) External Analysis (Porter's 5 Forces)

1) Barriers to Entry

High competition in the toy and game industries and entrance barriers are very low, as everyone can create a "toy" without much capital. This attracts many new companies, and entrepreneurs. For consolidated brands, there is a high investment into research and development in order to introduce new products continuously and compete between them for licenses or specific products and new opportunities by investing into smaller producers

2) Threats of substitute products

Cody Kit competes with other toy companies and high-tech specialized companies that produce other types of products nowadays considered as "toys". Direct competition and high-technology companies are not the only threat for the traditional toys seller, as the increase of the counterfeiting of toys in China is everyday stronger.

3) Bargaining power of buyers

Consumers are the main engine in the Toy Industry. They decide the current trends which make Toy Companies introduce new products in order to satisfy the rising population needs. Another reason is that society states when is "the time" to buy toys. Seasonal sales are a big deal for toy manufacturers.

4) Bargaining power of suppliers

As Cody Kit acquires the exclusivity of the product (Packaging with the brand of Cody Kit), they cannot be sold in retail stores. High quantity of suppliers (70% fix suppliers, 20% occasional suppliers). Cody Kit has the stronger bargaining power in the product design, and with the enormous amount of suppliers that exist to supply our raw materials, it is safe to say that there are many choices.

5) Rivalry among competitors

The easy entrance of new competitors in the toy industry, and higher price of its products can position Cody Kit in a weaker position, however the image and value created by Cody Kit is unique as they focus on the parents point of view (by having educational products, traditional toys, not related to a specific trend as films or tv shows, trial of the toys in shop, specialized employees, etc.) but also on the children's point of view (the main and most important customer is the child, specific entrance door inside the shop, package with the name of the child and a candy attached, etc.).

c) Internal analysis

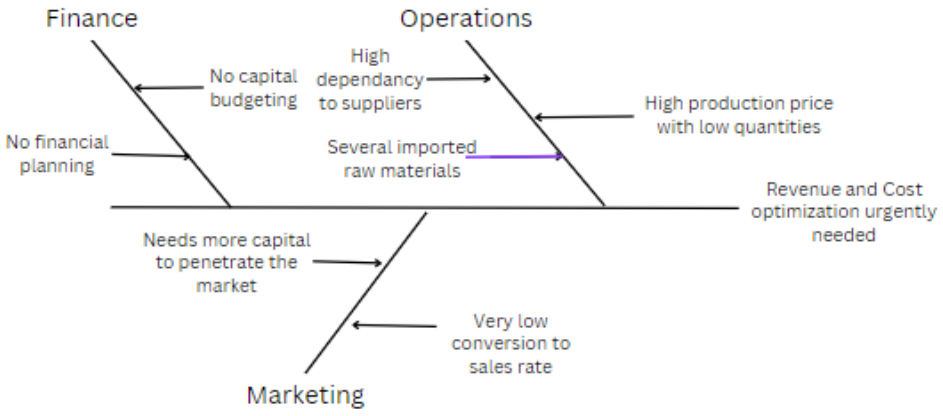
1) SWOT and TOWS Analysis

ISSN (Online): 2961-9602

STRENGTH + OPPORTUNITY	WEAKNESS + OPPORTUNITY
(SO1) – Brand Partnership With the already established brand, Cody Kit is able to fill the needs of computer science education that is required to be taught in schools and programs in this day and age **(SO2) – Fulfillment as a unique and innovative product for the growing demand of STEM Education** As the trend of STEM and coding education rises. Cody Kit has the opportunity to establish the presence as the go-to unique product to educate children.	**(WO1) – Partnership with established education brands** As Cody Kit currently has limited reach, we aim to partner with schools and other established educational institutions in order to reach and engage more children and parents, alongside using the word of mouth marketing strategy to save the marketing budget. **(WO2) – Partnership with suppliers** As Cody Kit's products are very vulnerable to changes from vendors and sensitive to policies from suppliers, we plan on partnering officially with trusted vendors and suppliers to supply us with the raw materials needed. This will help reduce costs and the uncertainty from third parties.
STRENGTH + THREAT	**WEAKNESS + THREAT**
(ST1) – Adaptive products for market's needs With the amount of competitions rising with the STEM trend, Cody Kit aims to be cemented as the go-to product by accommodating the market needs and keeping up with the trend in order to stay relevant among the competitions that are currently existing, or coming up in the near future. **(ST2) – Establishing the unique and innovative products** By establishing Cody Kit in the market with unique and innovative product, we aim to beat our competitors by having a unique product, which is our game, in order to get the market's attention.	**(WT1) – Third Party Dependancy** With a high dependence on vendors and suppliers, a disruption in supply chain could mean that Cody won't produce anything. To counteract this, we have to establish deals with better suppliers, and even outsource the raw materials if needed. **(WT2) – Better margin** With Cody Kit's relatively high price, any sort of economic downturns that impacts consumers' spending will have a massive impact. To counteract this, we have to fix an have a better margin by starting to mass produce a little, where we need more capital.

2) Technology Readiness Level
TRL shows the level of technology readiness in a scale from 1 – 9, where one level becomes the foundation of the next. Currently, Cody Kit is still an instrument for education that has been proven conceptually and functionally. After doing product testing and demonstrating the game, Cody Kit is currently on the TRL 8 where the company have undergone testing, but not ready to be mass produced.

d) Analysis of Root Cause



Cody Kit is having problems with high dependency from suppliers, making a supply chain disruption a big problem to face. On top of that, with high raw material costs unless purchased

ISSN (Online): 2961-9602

with high quantities which would harm the cash flow of the business, and some raw materials need to be imported, Cody Kit faces a financing problem to do these productions. From the marketing perspective, Cody Kit is having problems penetrating the market without well established products. Furthermore, with all the marketing efforts, the result shows that the company still has a very low conversion rate to sales.

DISCUSSION

a) Analysis of Alternatives

In this chapter the researcher will explain the analysis and scenarios that will be carried out. In the formation of a pro financial statement consisting of assumptions, income statement, balance sheet, and cash flow, the researcher will make monthly and yearly calculation. However, monthly calculations will only be carried out in the first year to minimize the risk of errors or miscalculations. After making the pro forma financial statement, the cost of capital will be calculated using the weighted average cost of capital (WACC). Afterwards, researchers will continue by calculating the feasibility of Cody Kit using payback period, NPV, and IRR. The scenarios that will be carried out by researchers to minimize the risks that may be encountered will use three scenarios, which are worst case, base case, and best case. At the beginning, the calculation will be using the base case scenario to become the benchmark of the other scenarios.

b) Initial Investment

Initial Investment	
Cash	Rp17,000,000
Inventory	Rp23,000,000
3D Printer	Rp5,000,000
Toy Kit	Rp10,000,000
Laptop	Rp40,000,000
Cloud Drive	Rp5,000,000

c) Pro Forma Financial Statement

The pro forma financial report is an initial step used to find out the cash flow generated by Cody Kit, where the cash flow itself can be obtained from the assumptions made by each account in the income statement and balance sheet. These assumptions are made quarterly in each year. These assumptions are very necessary to be able to make a pro forma financial report, these assumptions are made on the basis of primary data originating from current financial activities at Cody Kit and also supported by secondary data derived from benchmarking against other companies such as PT. Sunindo Adipersada Tbk. All of the financial statements can be seen at the appendices.

d) 5.4 Calculate WACC

Capital Asset Pricing Model	
Beta	1.03
Risk-Free Rate	7.25%
Market Return	9%
Cost of Equity	9.29%

The Capital Asset Pricing Model (CAPM) will be calculated using Beta, market return, and risk-free rate to generate the cost of equity value. The beta used is based on a similar business, which manufactures toys, named PT Sunindo Adipersada Tbk. The market return used is from the research from New York University by Aswath Damodaran, which indicates Indonesia's market risk premium is 9,23%, while the risk-free rate comes from the government obligation FR84 7.25% for 3 years tenor. Since Cody Kit does not use debt, the WACC is only calculated by cost of equity, which is 9,29%.

e) Feasibility Analysis

ISSN (Online): 2961-9602

In this final project, WACC is used to calculate the discount rate. The payback period of the project is 2.545 years with an NPV of IDR Rp21,175,355 and an IRR of 16.05%. The result shows that Cody Kit has a positive NPV, along with an IRR above the WACC which is 9.29%, and a payback period of less than 3 years, which was desired by the company, shows that the criteria has been met properly. Thus, it can be concluded that Cody Kit is feasible to carry out. In total Cody Kit will have a net profit of IDR 323,910,458 and a total asset of IDR 395,885,485.

f) Scenario Analysis

The analysis is done by changing the sales done each year and the growth per month. The worst-case scenario will produce a minimum value which can then be taken into account in the estimated risk level. The worst-case scenario gets a payback period of 2.556 years, with a total asset of IDR 310,590,532. The calculated NPV and IRR are IDR 10,252,502and 13.21% respectively. For the best case scenario, we have the payback period of 2.546 years, a NPV of IDR 32,199,866 and an IRR of 19.40%. From the figures, we can conclude that all 3 scenarios pass the feasibility tests.

Aspect	Scenarios		
	Worst case	Most likely	Best case
NPV	Rp10,252,502	Rp21,175,355	Rp32,199,866
Payback Period	2.855	2.821	2.763
IRR	13.21%	16.05%	19.40%

CONCLUSION

Cody Kit is a company engaged in the education industry with the products Cody Kit and Cody Play. Cody Kit itself is a coding based learning toy that uses visual block programming to eases children to learn coding, while Cody Play is an activity book that teaches the very basics of computational thinking. During the journey, Cody Kit encountered several obstacles including company's poor financial performance, a subpar financial recording system and no capital budgeting.

The company's initial investment is IDR 100,000,000 and is projected to have a payback period of 2,821 years, which is smaller than the projected 3 years. Cody Kit also generates a positive cash flow where it covers more than the initial investment, showing a NPV of IDR 21,175,335, with an IRR of 16,05%. The results shown answer the criteria needed so that it can be concluded that the project being implemented is now feasible to continue and is financially feasible. The researcher has made the worst case by reducing the sales growth, which resulted in a payback period of 2,556 years, a NPV of IDR 10,252,502, and an IRR of 13,21%. Meanwhile, the researcher also created a best case scenario, where the sales growth increased by a significant margin, where the result showed in a payback period of 2,546 years, a NPV of IDR 32,199,866, and an IRR of 19.4%.

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