THE OUTLOOK DIGITAL INDOOR ADVERTISING IN MINI-MARKET USING TECHNO ECONOMY ANALYSIS: IMPLEMENTATION IN INDONESIA

Tommy Hendrix  
*Research Center for Science, Technology and Innovation Policy and Management, Indonesian Institute of Sciences*, tomm001@lipi.go.id

Firman Tri Ajie  
*Research Center for Chemistry, Indonesian Institute of Sciences*, firm001@lipi.go.id

Mahardhika Berliandaldo  
*General Bureau, Indonesian Institute of Sciences*, aldo.vega17@gmail.com

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THE OUTLOOK DIGITAL INDOOR ADVERTISING IN MINI-MARKET USING TECHNO ECONOMY ANALYSIS: IMPLEMENTATION IN INDONESIA

Tommy Hendrix¹
¹Research Center for Science, Technology and Innovation Policy and Management, Indonesian Institute of Sciences
Jakarta, Indonesia
tomm001@lipi.go.id

Firman Tri Ajie²
²Research Center for Chemistry, Indonesian Institute of Sciences
Jakarta, Indonesia
firm001@lipi.go.id

Mahardhika Berliandaldo³
³General Bureau, Indonesian Institute of Sciences
Cibinong, Indonesia
aldo.vega17@gmail.com

ABSTRACT

Research Aims: This paper wants to confirm the process feasibility study and advantage application when technology in social media enters goods’ commercialisation.

Design/methodology/approach: The methodology used in this research qualitative research methodologies, with an approach to data analysis using techno-economic and collective data on digital indoor advertising.

Research Findings: The results of techno-economic analysis and feasibility analysis explaining digital indoor advertising business in Indonesia mini market is declared worthy of running, with description NPV on cash flows Rp. 3,664,679,991 and NPV sensitivity analysis of Rp. 3,554,930,887, IRR of 14.09%, and 13.96% (sensitivity analysis).

Theoretical Contribution/Originality: This research contributes to the growth rate of digital advertising usage in Indonesia by viewing and measuring the business feasibility relating to the products used and looking at the profit and loss projects for the company when willing to run the business based on the techno-economic analysis.

Practitioner/Policy Implications: This study intended as a reference and recommendation for promoting a product through a feasibility study, which tailors to the advantages implementation of digital indoor advertising mini-market in Indonesia. Especially for management/managers, product promotion becomes a strategy that has to play to catch up and develop market segmentation of a product.

Research limitation & implications: The implementation needs business feasibility in determining effective or not promoting a product through techno-economic analysis. Digital advertising, which placed in a mini-market, can potentially lift the branding of a product in the marketing function.

Keywords: Outlook, Digital Indoor Advertising, Mini Market, Techno-Economy Analysis
INTRODUCTION

The current development of the advertising industry has experienced rapid progress and the development of information technology. The contribution of the advertising sector has proven capable of providing significant growth for Indonesian engineers in recent years. Although the contribution to the economic sector is still low, namely 0.58%, the growth rate is relatively higher than the average creative economy. Mapping the economic contributions of advertising as part of the creative economy emphasises measurements based on the gross domestic product (GDP), employment, corporate activity, household consumption, and national exports.

Currently, most manufacturers realize the importance of advertising strategy may be implicated products change consumers’ perception in purchasing a product. Advertising has always known to be one of the critical factors that affect the consumer’s decision-making process (Haider & Shakib, 2018). Conscious advertising tries to change consumer opinion on a product by changing the perception of the product through information on the features and advantages of the product displayed. Its advertising was regarded as a form of personal communication used for commercial purposes. However, times and technology led the expansion of the meaning and scope of advertising and followed the changing lifestyles around the world. Technological developments that change the way human communication has shifted to the digital era, forcing the advertising industry to shift in the same direction (Taneja & Vij, 2019). Advertising’s success to influence consumer attitudes and behaviours is attracting governments, non-profit organisations, political parties, and individuals. The advertising industry is leveraging the presence of the internet to diversify the media in digital advertising and allow interactive advertising to be created as non-personal communication.

In this era of globalization, technology cannot be separated from all aspects of life, including advertising. The role of technology dramatically affects the value of product creation in the advertising industry. Indonesia’s Digital Media Advertising is proliferating and contributing to the Indonesian economy, as it has in other Southeast Asian countries and will grow every year. The analysis states that digital media advertising is much more helpful than traditional media because people are used to the internet-connected to their cellphones. The development of information technology and electronic media has provided various facilities in disseminating information and improving the players’ quality and quantity. There are various ways to provide product information to consumers by utilizing the current digital era, and one of them is Digital Indoor Advertising/Digital Signage.

Advertising is product information or services from producers to consumers and delivering messages from sponsors through media. “Advertising is an advanced communication process that brings audiences to the most important information they do need to know” (Jefkins, 1997).

Frank Jefkins’ statement explains that advertising is a message from producers to potential consumers to get as much information as possible from the advertised product or service. It can be said that advertising influences consumer attitudes and experiences, affecting the product life cycle and leading to the desired target market (Vakratsas & Ambler, 1999). Advertisements are made to convince consumers about the products offered. Apart from an attractive design, the ad placement must be in a place or medium that is easy to see and remember.

New media using new digital technology have been continually developed and launched onto the marketplace, and the importance of these digital media has increased in the advertising industry. Specifically, digital signage as a new digital medium is becoming more and more critical in the industry (Ko et al., 2005) motivations for using the Internet, given its interactive features and dynamic multimedia presentations. Digital signage usage varies by consumers depending on their demographics, such as gender and age. Digital indoor advertising/digital signage networks are relatively new retail atmospheric stimuli (Hough et al., 2016). While prior research has demonstrated that shoppers welcome digital signage information and find it aesthetically pleasing, its actual influence is unknown and requires further research (Dennis et al., 2014, Newman et al., 2006). Digital signage delivers content for four primary and often overlapping purposes: commercial, informational, experiential, and behavioural. Of these, commercial applica-
tions are overwhelmingly the most common (Schaffler, 2013). DS is especially effective in reaching out to consumers regardless of time and place (Bauer et al., 2012). It influences the atmospheres of commercial spaces, better enabling market segmentation and enhancing purchase decisions (Dennis et al., 2014).

Hough (2016) has identified three motivational factors for digital signage: timely information, entertainment, and profit. Based on Hough’s study, timely information and benefit features of Digital Signage because these two factors positively lead to consumer’s intention to use indoor digital advertising/digital signage. Among these two motivational factors, timely information is a stronger motivator than benefit, and the entertainment features do not seem to influence consumers’ indoor digital advertising/digital signage use.

Denis (2014) has investigated that digital signage content high on sensory cues evokes affective experience and strengthens customers’ experiential processing route. In contrast, digital signage messages high on “features and benefits” information evoke the intellectual experience and strengthen customers’ deliberative processing route.

Digital Indoor Advertising is a way that allows manufacturers to reach their customers while travelling or shopping in a mini-market/supermarket/shopping centre. Today’s digital media system allows for quick ad changes. By creating a preset playlist, media content broadcast via LED/LCD screens can target the producer's demographic. Using these ads will be faster if they are related to the market, especially in commercial uses. Those signs will lead to digital information technology where everyone interests to seek something different as usual. This stage of the commercial need confirmed to measure the advantage of using ads to disseminate products or places that can be found.

Through techno-economic analysis, give something to remind, such as the business process’s activity and results from both investment and performance analysis, to select the most cost-efficient solution for a specific scenario and performance requirements. The network architectures in the calculation, including investment analysis, will combine all cash flows (costs and revenues in time) and decide on the investment project’s profitabil-

ity. Key performance indicators techno-economic consist of Cash Balance, eNet Present Value (NPV), Internal Rate of Return (IRR). Furthermore, measure performance parameters are the cost per capacity unit for each user. It can be a more indicative measure than the cost per user as it would allow for a fair comparison of different access technologies. The relation between cost and reliability also should be evaluated. A large variety of reliable network architectures has been developed in recent years to offer high service availability in NG access networks (Chen & Wosinska, 2007).

The placement of advertising media within a mini market can provide important information to consumers. The producers put consumption goods in a place of shopping (mini-market) that the consumers visit every day. With thousands of mini-markets scattered throughout the country, it can increase the selling value of a product that will sell in the current market. With consumers’ intelligence in choosing, enabling their products to be installed, ads can positively value their own. When consumers spend more time outside their homes to shop and travel, the opportunity to advertise through the media also increases. With this digital media indoor advertising, it can make an ideal target audience where consumers can spend time with the ads that information can ensure through advertising can be direct to consumers. That way, advertising through indoor digital media can positively value producers and consumers in the day.

Business units of advertising fields that move on digital indoor to date are still few. Therefore, the information needed through business feasibility analysis/technical analysis before investing in the field. With large numbers of mini-markets throughout the country, it is necessary to calculate how feasible it is in this way. So in the implementation of this advertising business, it can be known a decent financial level. All of those, especially in Indonesia, are still moving fast based on consumer’s requirements and become a strategy to lift some branding products in market penetration.

Many positive sides of digital indoor advertising have been reviewed from various studies. We consider it necessary to reveal the business feasibility of digital indoor advertising
as a non-traditional business that can provide advertising services as a product offered to manufacturers consumer awareness.

In this paper, Outlook Digital Indoor Advertising aims to see and measure the feasibility of a business related to the products used and to see the company’s profit and loss project when it wants to run a business based on techno-economic analysis. Meanwhile, criticism of the outlook for digital indoor advertising must be clarified through several innovative steps that increase the ability to produce useful information for corporate decision-makers. Apart from the same view, this feasibility study is one of the most critical economic development factors. There are many difficulties encountered in measuring and calculating technological knowledge. Data sources capable of being the basis for studying technological knowledge have limitations stemming from the inherent difficulties in measuring knowledge.

LITERATURE REVIEW

The concept of Digital Ecosystems proposed as a new way to perceive the increasingly complex and interdependent systems created (Fiorina, 2000). The Digital Ecosystem is a new, multidisciplinary concept that is difficult to define, resulting in many definitions depending upon the perspective from which it defined (e.g., ecology, economics, and technology), making the concept difficult to understand. From an economic perspective, the Digital Ecosystem is “a useful metaphor for understanding the dynamics of business networks at the regional and sectoral levels and their interaction with and through ICTs” (Dini et al., 2005). In the ecosystem that has evolved in literature, we find a set of intermediaries taking part in an auction, which connects buyers and sellers of a unique, indivisible good (Feldman et al., 2010) we study a setting where potential buyers of a unique, indivisible good attempt to purchase from a central seller via a set of intermediaries. Each intermediary has captive buyers, and runs an auction for a ‘contingent’ good. Based on the outcome, the intermediary bids in a subsequent upstream auction run by the seller. In this paper, we study the equilibria and incentives of intermediaries and the central seller. We find that combining the notion of optimal auction design with the double-marginalization arising from the presence of intermediaries yields new strategic elements not present in either setting individually: we show that in equilibrium, revenue-maximizing intermediaries will use an auction with a randomized reserve price chosen from an interval. We characterize the interval and the probability distribution from which this reserve price is chosen as a function of the distribution of buyers’ types. Furthermore, we characterize the revenue maximizing auction for the central seller by taking into account the effect of his choice of mechanism on the mechanisms offered by the intermediaries. We find that the optimal reserve price offered by the seller decreases with the number of buyers (but remains strictly positive).

Digital Ecosystems are commonly described as open, loosely coupled, self-organising digital environments in which the constituent agents or species are proactive and responsive for their benefit. Digital ecosystems show exciting research and applications in the economic, social, and political sectors and deal with the complex dynamic problems in complicated digital environments. The digital ecosystem era mainly impacts how the advertising landscape requires an ability to see the layers of challenges and the opportunities for solutions that can lead to a new value.

Digital communication is specific and increases perception and remembering of the received information. Companies can quickly get instant feedback from customers and respond to it. Companies use different tools in their digital marketing communication process (Slijepčević & Radojević, 2018).

Hargude et al., (2016) mentions that there are at least six types of marketing techniques that are currently widely used:

1. Modern techniques for market research:- In the past, market surveys were conducted using questionnaires, personal interviews. Now they can be conducted through online surveys using various websites or social media like Facebook.
2. Digital marketing:- The concept is developed in the timeframe of 1990-2000. At first, various Automobile firms started it by providing floppy or CD-ROM (containing the information of their product) and the magazine or newspapers. It can be done through online demonstrations, online videos, Virtual reality.
3. Direct marketing:- Almost all information about the product and organization is now available with their web portals. Companies are preferring direct reach to the customers instead of any other channel.

4. Mobile marketing:- Mobile became an essential part of our life. Companies are now doing advertising through mobile messages.

5. Marketing automation:- This is an exciting thing and technology developed for the marketing department to carry out its function effectively. It helps the tasks of E-commerce, online, and web portal issues. The advantage is that it is not required for the customer to install any software, but it is a web-based solution.

6. Marketing through CSR:- Corporate Social Responsibility is indirectly a tool for marketing. Organization can find a new set of customers times while performing CSR projects.

Yang et al. (2020) have a study exploring consumer adoption of Online to Offline (O2O) commerce based on Perceived value theory and the technology acceptance model and examines the role of the unique features of O2O commerce in consumer adoption behaviour. They investigate the two unique constructs of Online to Offline commerce, physical experience and the integration of online and offline information, which are confirmed as two antecedents of perceived value, perceived benefit, and perceived usefulness based on Technology Acceptance Model (TAM) and Perceived Value Theory (PVT). In addition, physical experience is shown to be an alleviator of perceived risk in an O2O context. There is still a debate about consumer behaviour that has shifted back to a classic approach that focuses on physical experience in making product selection. One of the bases for this research because digital signage is still an effective tool for attracting and transforming consumer perceptions of products.

Digital Signage, an interactive advertising medium, emerged in the 1970s with the advent of indoor advertising utilising television screens paired with video cassette recorders. Digital signage allows for the display of more compelling advertising. Instead of a single static image, digital signage supports dynamic multimedia presentations that better attract and retain the viewer’s attention.

Digital advertising can contain video, animation and audio and is at least as compelling as television advertisements (Lee et al., 2011). Digital signage, in its simplest form, is a “remotely managed digital display, typically tied in with sales, marketing and advertising” (Schaffler, 2013). It is most commonly considered an advertising-oriented concept (Burke & Stets, 2009).

Developing a strategic, risk-based approach to digital advertising activities can make the difference between an organisation that rides trends and gets ahead of them and even shapes them. Developing digital advertising strategises to know how effectively leverage traditional and digital advertising and convergence within the total marketing.

![Figure 1. Show Digital Ad. Worldwide Spending 2018 – 2023 (Enberg, 2019)](image)

Figure 1 shows that in 2019, worldwide digital ad spending will rise by 17.6% to $333.25 billion. That means that, for the first time, digital will account for roughly half of the global ad market. Includes advertising that appears on desktop and laptop computers and mobile phones, tablets, and other internet-connected devices. Includes all the various advertising formats on those platforms; excludes SMS, MMS, and P2P messaging-based advertising. (Enberg, 2019).

Advertising nowadays was an essential tool to provide much information related to market products. This scheme very popular to grab and deliver specifications of the product to customers while the process was disseminating new products introduced. The development of the retail industry was instrumental in market achievement through commercial-
ising kind of goods for customers. In retail, distributing goods was the last link in the distribution process. Through retail, a product can meet its users directly. The retail industry defined as an industry that sells products and services that have added value to meet personal, family, group, or end-users needs. The products mainly sold fulfil household needs, including nine essential ingredients. The retail business also experiences the same thing in common due to the emergence of various businesses that will eventually compete to get consumers. Retail business is the sale of goods in various types of outlets such as kiosks, markets, department stores, boutiques, and others (including sales with delivery service systems), which are generally used directly by the buyer in question. The various types of retail formats and their type continue to develop, starting from hypermarket, supermarket, and mini-market to the grocery store that belongs to the traditional market. All types of retail do their business market opportunities and government efforts to encourage retail business development.

Online digital media is a real-time medium of communication that is a strategic tool for building brands through marketing and advertising campaigns. Companies now more tilted towards the different channels of digital media. The interactive online digital media is an active channel for interacting with the consumers in real-time and getting instantaneous feedback regarding the products and services (Ahmed et al., 2019). We investigate the impact of different channels of online media, such as email marketing, mobile phone marketing, search engine optimization and companies’ websites, and social media marketing for the effectiveness of online digital media advertising. Moreover, the researchers have introduced eight mediating variables and six moderating variables to examine the impact between exogenous variables and online digital media advertising (endogenous).

The consumer habit of buying is a way to conduct various situations and reactions. The purchasing of goods, services, or receiving consumers will be an idea. A valid retailer should reward this consumer’s habit in a more understanding of the customers so that the two parties can complement each other needs. The information needed by retailers to understand consumers’ habits in buying are things related to what and how many consumers buy, who make purchases, and how and where consumers buy (Vinci, 2009). The retail industry in Indonesia contributes significantly to the Gross Domestic Product (GDP) and also absorb the workforce in a large amount. As a developed country, industrial growth figures Indonesia’s retail strength is influenced by purchasing power, increasing the number of people, and the community’s needs will fulfill consumption products. The modern retail industry’s presence uses community spending patterns, mainly middle and upper classes, who do not want to jostle in traditional markets that are usually checked or not neatly arranged. Although this new retail presence highlighted can turn off the traditional market because it has an edge on many factors, its development can be unstoppable. In other words, we can say that retail was an essential part of the product distribution process chain from producers to consumers. Thus, it can say that the retail industry has a significant role to fulfill individual, family, and other end-user needs.

For some cases in food and beverage, at the moment, traditional grocery retailers are still the dominant sellers. Even so, they have been losing market shares to modern retailers, such as convenience stores, supermarkets, and hypermarkets, in recent years. In 2010, traditional grocery retailers still had a retail sales value share of 87.8%, and until 2015, that share decreased to 83.2%. In the same period, the share of mini-markets, such as convenience stores, increased from 3.8% to 8.2% in retail sales. Fluctuating between around 7.9% and 8.7%, the share of super- and hypermarkets in retail sales did not change significantly in this period. These dynamics also found in the change in the number of grocery retail outlets. Between 2010 - 2015, the number of convenience stores increased annually,
on average 17% to 26,700, and the number of hypermarkets grew annually, on average 11.8% to 300. The number of supermarkets increased less quickly but still experienced an annual average growth rate of 4%. In 2015, there were 1,400 supermarkets in Indonesia. While the number of modern grocery retail outlets increased, the number of traditional grocery retailers decreased by 0.1% annually. However, in 2015 there were still 4.5 million traditional grocery sellers, as illustrated in figure 2. (eibn.org, 2017).

Figure 2. Shares of Retail Outlets in Total Retail Sales Value
Source: (eibn.org, 2017)

The positioning of mini-markets become one of the modern markets with a vast number and its spread in almost the entire city, mostly see many advantages in commercial usage. In Indonesia, mini-market development looks like a huge trend, especially in business activities. The growth of mini-market that scattered throughout the districts and cities in Indonesia. One type of retail business that is still very prospective is a mini-market. Modern lifestyle change encourages consumers would instead shop retail needs in nearby places. As a one’s modern retail industry, mini-market plays a vital role in the country’s economy, given its significant market penetration and reaching the corners of the country and being one of the main channels in distributing goods. There are some of a franchised mini-market compared to the small shops in commercial usages, such as (1) strategic location on the edge of the highway, the place is more spacious, clean, comfortable for the buyer and the parking area is spacious (2) The price is relatively lower for some items, especially they have some promo offered, (3) The goods are complete because the capital is significant, and (4) friendly staff. Those advantages can significantly impact when mini-market runs their business to customers. Nevertheless, if we can see the spreading growth of mini-markets, market target expands must be located from metro areas into suburbs, villages, or even neighbourhood.

One of the most important things is how the mini-market can sustain itself in the modern era. Regardless of many commercialisation activities in selling all of their goods into the market, especially to customer needs, the digital era shows how mini-market should sustain their business by effectively and efficiently selling their products. Furthermore, to show how to advertise their product to the public, it needs a tool to see how feasible it to disseminate the kind of product through digital indoor advertising. Disseminating to the public a mini-market can be done if we can calculate economic impact with techno-economic analysis. That delivers all components of investment of equipment, estimated cost and incomes, and investment analysis calculation in a mini-market using digital technology, including the ability to complete into account legal, economic, technological, scheduling, and other factors. The feasibility of techno-economic analysis allows investigating the possible negative and positive outcomes of a project before investing too much time and money. Identifying significant barriers, invest in a specific technology unfeasible in a particular environment, even though it would seem financially attractive. The economic validity of introducing new technology has mainly focused on financial analysis based on market feasibility, such as expected sales and technology feasibility, such as expected saving cost by the technology. However, firms must carry out strategic behaviour using technology for their current and future competitiveness (Kim, 2016). Techno-economic modelling is a method used for evaluating the economic feasibility of complex technical systems. The nature of the modelling and analysis is future-oriented, utilising several methods from the broad field of future-oriented technology analysis (FTA) (Keenan et al., 2008). Including cost-benefit analysis, scenarios, trend analysis, expert opinion, and quantitative modelling for an extensive list of other FTA methods families and methods see (Scapolo & Porter, 2008). Typically, techno-economic models combine high-level market and service-related parameters and forecasts with relevant cost and performance-related parameters of the technologies required to deliver the customers’ services (Markku et al., 1998). Based on the estimated costs and revenues, several indicators used to determine the scenarios’ profitability, including, e.g., payback period, net present value (NPV), and internal rate of return (IRR). Based on forecasts and assumptions regarding these as well as a few generic economic inputs such as the discount factor, period of study, and rest value of investments at the end of the period, the models calculate revenues, operational costs, and in-
vestments, as well as cumulative cash flows and decision-making criteria such as net present value (NPV), internal rate of return (IRR), and payback period. (Olsen, 1999). The main objectives of techno-economic modelling as:

1. to compare different technical options in order to find the most cost-effective solutions,
2. to look at the feasibility of different evolution scenarios,
3. to find what parts of the network contribute most to the overall cost, and
4. to identify strategies that are robust to different patterns of demand (Graff et al., 1990).

Forecasting in techno-economic analysis performs prediction related to product launch decisions, capacity planning, manufacturing decisions on raw materials procurement, manufacturing schedules, and finished goods inventory levels, logistics decisions on network design and physical distribution planning, marketing decisions on marketing budgets and promotion schedules, sales decisions on support materials and salespeople training and finance decisions on corporate budgets and financial expectations for the new product. Figure 3, Show the Total growth rate of media ad spending is double-digit with a % change during 2019. It means that emerging new technology is very influential in the commercial process in social media (Enberg, 2019).

![Figure 3. Total Media Ad Spending Growth in Indonesia](Source: (Enberg, 2019))

**RESEARCH METHOD**

Our study of indoor digital advertising is focused on building complementary businesses for mini-markets. Mini markets can play a role as the owner of a digital indoor advertising business or as a partner of an advertising company. Digital indoor advertising increases revenue for mini-markets by exploiting loopholes to increase awareness of certain products.

This paper used qualitative research methodologies, with an approach to data analysis using techno-economic. This analysis focused on finances connected to market penetration in sales with the cost of the technology. New technology defines in strategy competitiveness model with commonly used essential identification of requirement calculation from material until the end product goes to the market.

With gathering current collective data on digital indoor advertising such as investment equipment, the variable cost, fixed costs, estimated acceptance, conditional acceptance & expenditure, profit/loss after tax & profit on sales to understand the feasibility and business value. According to the taxonomy of techno-economic modelling, it can create a category as research stressing innovation’s utility, the primary focus being on innovation-evaluating research approach (Järvinen, 2004). While the data analysis method used is the investment feasibility analysis based on the criteria of investment feasibility, namely Net Present Value (NPV), Internal rate of return (IRR), Payback Period, and Benefit-Cost Ratio (B/C Ratio).

The techno-economic framework on digital indoor advertising in mini-market confirms the description related to the process feasibility study and advantage application when technology in social media enters the commercialisation of goods. This calculation brings much information on prospective e-commerce, fulfilling the customer’s needs. Figure 4 shows the calculating step when digital indoor advertising enters to mini-market.

![Figure 4. A framework of Feasibility Techno-economic on Digital Indoor Advertising in Mini-market](Source: (Enberg, 2019))
4 words were identical to one another and the fifth word was either the same or different. In the other condition, the first 4 words were different from one another but were drawn from the same semantic category. The fifth word was either from the category or from a different category. Matches occurred in 15% of the trials and mismatches in 85%. The ERP to the fifth word was analyzed. All ERPs evidenced a late positive component (LPC. The project is accepted if NPV marked as positive (> 0), and the project rejected if NPV marked as negative (< 0). Systematically, NPV formulated as follows:

\[
NPV(i\%) = \sum_{K=0}^{N} F_k (1 + i)^{-k}
\]

Description:
- \(i\) = interest rate
- \(K\) = to-\(K\) period index (0 \(\leq\) \(K\) \(\leq\) \(N\))
- \(F_k\) = cash flows at the end of the \(K\) period
- \(N\) = number of periods on the planning horizon

The Internal rate of return (IRR) is the interest rate that will equate the current amount of value from the receipt expected to be received (present value of future proceed) with the present value of expenditure on investment (Sullivan et al., 2015). The acceptance or rejection of an investment proposal is to compare IRR with the required rate of return. If IRR > The required interest rates, then the project is accepted.

The payback period is the time required to restore an investment’s capital, calculated from net cash flows (Sullivan et al., 2015) the first 4 words were identical to one another and the fifth word was either the same or different. In the other condition, the first 4 words were different from one another but were drawn from the same semantic category. The fifth word was either from the category or from a different category. Matches occurred in 15% of the trials and mismatches in 85%. The ERP to the fifth word was analyzed. All ERPs evidenced a late positive component (LPC. The project accepted if the investment capital’s recovery time is shorter than the economic age, and the project rejected if the investment capital is longer than the industrial age (Subagyo, 2007). The formula used to calculate the payback period is as follows.

\[
\text{B/C ratio} = \frac{\text{Present value of cash flows}}{\text{Present value of cash flows expenditure}}
\]

The benefit-Cost Ratio is the ratio between the present value acceptance of cash flows and the present value of cash flow expenditure (Atmaja, 2008). The B/C ratio measures the present value for each invested rupiah. During the B/C ratio \(\geq 1\), then the project’s proposal is acceptable, but the proposal of the project should be rejected if otherwise.

RESULTS AND DISCUSSIONS

Initial Investment

The initial investment is a type of capital that must be issued at the start of the business and usually used for the long term. Based on the observation results, the need to implement the Digital Indoor Advertising project in Mini Market in table 1, as follows.
Based on the tables above, the total investment cost is Rp. 27,513,000,000. The initial investment divided into 3 (three) parts, namely investment in hardware equipment, investment in Software, and investment in work equipment and utilities. From these three, the most significant investment in Hardware equipment is Rp. 24,450,000, and it can explain that this project advertising main element is screen and Wi-Fi modem that will be placed in mini-markets each location. Every one mini-market location takes three-screen units with one Wi-Fi Modem. It used to be controlled remotely via the Internet network to update the system related to advertising remotely in one part of the project work system.

To support the implementation of the project needed a reliable software system. This Software used to upload the previous employment contract’s ad content. All advertising content created by the agreement is uploaded in the system’s playlist as the agreement appears. Therefore, to not be interrupted by connection, it requires a reliable server/cloud in the way of the system to be well protected. The need for this software equipment is required. Investments are not a little (as stated in Table 1) because they need a super-advanced and good connection.
Estimated Cost and Income

A business or operating company will bear a cost, so no wonder that there are various types of costs in a business. As an entrepreneur, it is necessary to know the various types of costs that managed. Knowing the classification of costs will manage the cost well so that business operations will be more efficient.

Variable costs are costs that amount to grow as production volumes increase. Meanwhile, fixed costs are the operating costs of companies whose numbers are unchanged under stable business conditions. In other words, variable costs will change in line with the activity change, but this fixed cost is constant, unchanged.

Table 2. Variable Cost

| No | Cost Structure       | Unit   | Number of Physical | Cost per unit (Rp.) | Total cost one month (Rp.) | Total cost one year (Rp.) |
|----|----------------------|--------|--------------------|---------------------|---------------------------|--------------------------|
| A  | Installation Fee     |        |                    |                     |                           |                          |
| 1  | Fuel Vehicles        | Litre  | 600                | 8,500               | 5,100,000                 | 61,200,000               |
| 2  | Installation Fee     | Screen | 250                | 250,000             | 62,500,000                | 750,000,000              |
| 3  | Unexpected Charges   | Month  | 1                  | 12,000,000          | 12,000,000                | 144,000,000              |
| 4  | Installation Equipment| Box   | 5                  | 1,000,000           | 5,000,000                 | 60,000,000               |
| 5  | Cable NYM 2x1,5      | Roll   | 25                 | 750,000             | 18,750,000                | 225,000,000              |
| 6  | Stop Contact 3 Holes | Pieces | 100                | 75,000              | 7,500,000                 | 90,000,000               |
| 7  | Steaker              | Pieces | 100                | 25,000              | 2,500,000                 | 30,000,000               |
| B  | Controlling Cost     |        |                    |                     |                           |                          |
| 1  | Fuel Vehicles        | Litre  | 200                | 8,500               | 1,700,000                 | 20,400,000               |
| 2  | Environment Permits  | Location| 20          | 1,000,000          | 20,000,000                | 240,000,000              |
| 3  | Unexpected Charges   | Location| 20           | 3,000,000          | 60,000,000                | 720,000,000              |
| C  | Maintenance Cost     |        |                    |                     |                           |                          |
| 1  | Fee Maintenance      | Outlet | 60                 | 250,000             | 15,000,000                | 180,000,000              |
| 2  | Fuel Vehicles        | Litre  | 300                | 8,500               | 2,550,000                 | 30,600,000               |
| D  | Direct Employment    |        |                    |                     |                           |                          |
| 1  | Field Technician     | Person | 6                  | 3,000,000           | 18,000,000                | 216,000,000              |

Total Variable Cost

230,600,000 2,767,200,000
To implement the initial working capital required for the first three months of the work operation. In this case, the source of capital funds divided into two parts, derived from the credit of 75% and own capital of 25%. The amount of capital required is Rp. 2,491,800,000 with details of Rp. 1,868,850,000 (source of credit) and Rp. 622,950,000 (own capital).

While advertising revenue derived from the number of advertisements registered in the company under its work agreement. Generally, the ad period in digital advertising given 15 seconds/serving. The viewing time in mini-markets for 12 hours per day with varying price conditions is calculated based on the time type of peak time (16.00 – 20.00) and leisure time (08.00 – 16.00). Total spot per day several 2,880 spots by being divided into two spot section is 80% for commercial spot and 20% for non-commercial spot.

Table 3. Fixed Costs

| No | Description                      | Amount | Unit       | Cost Per Unit | Total Cost 1 Month | Total Cost 1 Year |
|----|----------------------------------|--------|------------|---------------|-------------------|------------------|
| 1  | Labour                           |        |            |               |                   |                  |
|    | - Project Manager                | 1      | Person     | 6,000,000     | 6,000,000         | 72,000,000       |
|    | - Supervisor                     | 1      | Person     | 5,000,000     | 5,000,000         | 60,000,000       |
|    | - IT Technician                  | 3      | Person     | 4,000,000     | 12,000,000        | 144,000,000      |
|    | - Administration                 | 1      | Person     | 3,500,000     | 3,500,000         | 42,000,000       |
| 2  | Modem Pulse                      | 1000   | Unit       | 250,000       | 250,000,000       | 3,000,000,000    |
| 3  | Mini Market Electricity          | 1000   | Location   | 250,000       | 250,000,000       | 3,000,000,000    |
| 4  | Office Internet                  | 1      | Month      | 1,000,000     | 1,000,000         | 12,000,000       |
| 5  | Warehouse Electricity            | 1      | Location   | 2,000,000     | 2,000,000         | 24,000,000       |
| 6  | Office Stationery                | 1      | Month      | 1,000,000     | 1,000,000         | 12,000,000       |
| 7  | Miscellaneous Charges            | 1      | Month      | 20,000,000    | 20,000,000        | 240,000,000      |
| 8  | Tuition                          | 1      | Month      | 1,000,000     | 1,000,000         | 12,000,000       |
| 9  | Permits                          | 1      | Month      | 25,000,000    | 25,000,000        | 300,000,000      |
| 10 | Warehouse Rent                   | 1      | Location   | 10,000,000    | 10,000,000        | 120,000,000      |
| 11 | Car Rent                         | 3      | Car        | 6,000,000     | 18,000,000        | 216,000,000      |
| 12 | Vehicle Maintenance              | 1      | Month      | 1,500,000     | 1,500,000         | 18,000,000       |
|    | TOTAL                            |        |            | 600,000,000   | 7,200,000,000     |                  |
|    | Fixed Costs                      |        |            | 600,000,000   | 7,200,000,000     |                  |
|    | Total Cost                       |        |            | 830,600,000   | 9,967,200,000     |                  |
|    | 3-month Working Capital          |        |            | 2,491,800,000 |                   |                  |

Figure 5. Estimated Acceptance

Figure 5 explains that the projection of acceptance from the first year to the fifth year increases annually. In calculating the acceptance projection, in the first year calculated, the achievement rate of AD acceptance is only 50% of the maximum quota. The second year amounted to 65%, the third year of 75%, the
fourth year at 80%, and the fifth year of its optimisation rate was 95%. Digital Indoor Advertising is new to the mini-market so that in the first year, the optimal level of advertising sales is only 50%.

As the era progresses, ad acceptance is increased each year by strengthening the excellent marketing system. Producers (mini-market goods providers) can be entirely interested in marketing their products through Digital Indoor Advertising.

Figure 6 delivers the number of costs and the receipt, then the projected loss/profit of a project over the next five years. In this report, brief information on the costs incurred a company’s operation as profit gained during the company’s operation. Income Statement: A business entity must know the company’s condition and development, whether to obtain a profit while running the business or instead lose.

![Figure 6. Comparative Acceptance & Expenditure](image)

Figure 7 shows that the amount of admission annually is higher than the amount spent. With more acceptance, the company will earn profit annually. So this project has an optimistic number to be executed. The following is the result of the calculation of profit after tax and Profit on Sales.

Investment feasibility analysis used to predict the success rate of business activity. The analysis can decide to execute the project, suspend or not even run it (Prasetya et al., 2014). The techno-economic calculation is used as the basis for determining the cost of investment and operational cost so it can be known the business feasibility required in calculating financial aspects.

**Cash flow analysis**

Determine the outcome of financial feasibility analysis, and it is necessary to pre-compile the cash flow projection until the fifth year. The counting process is necessary to know what cash flows in and how cash flows out. Furthermore, by using a discount factor of 10%, we can know the value of the present value from a project. Table 4 shows the present value used to determine the value of the feasibility analysis compiled earlier.

**Table 4. Present Value of Cash Flow Projection**

| No. | Description | Present Value | Cumulative Present Value |
|-----|-------------|---------------|-------------------------|
| 1   | Year 0      | (27,513,000,000) | (27,513,000,000)         |
| 2   | Year 1      | 3,149,949,845  | (24,363,050,155)         |
| 3   | Year 2      | 5,402,971,086  | (18,960,079,069)         |
| 4   | Year 3      | 6,361,866,920  | (12,598,212,149)         |
| 5   | Year 4      | 6,419,585,000  | (6,178,627,149)          |
| 6   | Year 5      | 9,843,307,140  | 3,664,679,991            |

Table 5 share cumulative information based on the results of the analysis above, can be calculated as financial analysis related to the project, where the results obtained adjusted to the current criteria.
Table 5. Results of Cash Flow Projection Feasibility Analysis

| No. | Feasibility Analysis | Result Description |
|-----|----------------------|--------------------|
| 1.  | NPV                  | 3,664,679,991 (+), Feasible |
| 2.  | IRR                  | 14.09% > Interest; Feasible |
| 3.  | Net B/C Ratio        | 1.13 > 1; Feasible |
| 4.  | PBP (Year)           | 4.96 - |

From the above analysis is known that NPV value Rp. 3,664,679,991, which means positive (+) it can be concluded that the project can run well. The results obtained in the IRR analysis of 14.09%, which means more than the calculated interest rate. The Net B/C Ratio analysis results also obtained > 1, which means that the project deserves to execute following the calculations mentioned. Moreover, the payback period is obtained 4.96 years or still far from the number of year requirements. In general, it can insert from the outcome of a feasibility analysis. The project is feasible.

**Cash Flow Sensitivity Analysis**

Sensitivity analysis is an analysis to see the influences of changing circumstances (Gittinger, 1986). Sensitivity analysis is also an analysis conducted to determine the consequences of changes in production parameters to change production system performance in generating profits. By conducting a sensitivity analysis, the resulting consequences of these changes can know and anticipated beforehand. This sensitivity analysis anticipates the changes in variable cost increase and decrease in revenue. Table 6, assuming the others are the same, the results are obtained against the PV.

Table 6. The present value of the Projected Cash Flow Sensitivity Analysis 2% (Assumption)

| No. | Description | Present Value | Cumulative Present Value |
|-----|-------------|---------------|--------------------------|
| 1   | Year 0      | (27,513,000,000) | (27,513,000,000) |
| 2   | Year 1      | 3,121,291,664 | (24,391,708,336) |
| 3   | Year 2      | 5,379,714,888 | (19,011,993,449) |
| 4   | Year 3      | 6,340,724,921 | (12,671,268,528) |
| 5   | Year 4      | 6,400,365,001 | (6,270,903,527) |
| 6   | Year 5      | 9,825,834,414 | 3,554,930,887 |

Based on table 7, the analysis results above can calculate financial analysis against the anticipation of the changes that will occur, which results obtained adjusted to the current criteria.

Table 7. Result of Feasibility Analysis of Cash Flow Sensitivity Analysis 2% (Assumption)

| No. | Feasibility Analysis | Result Description |
|-----|----------------------|--------------------|
| 1.  | NPV                  | 3,554,930,887 (+), Feasible |
| 2.  | IRR                  | 13.96% > Interest; Feasible |
| 3.  | Net B/C Ratio        | 1.13 > 1; Feasible |
| 4.  | PBP (Year)           | 4.98 - |

Based on the results above, obtained NPV, IRR, Net B/C Ratio, and PBP is not much different from the projection of cash flows. NPV is still quite positive with the value of Rp. 3,554,930,887. While IRR obtained 13.96% and the market interest that this investment’s conclusion has determined is feasible. It shows on the Net B/C Ratio of 1.65, which is still above the value 1 (>). For the return on investment, still under four years, with the results obtained by 4.98 years. In general, it can deduce from the results of this sensitivity analysis and the project to execute still categorised worthy of running.

Suppose we look at the current offline store concept, which always displays stagnant or monotonous product promotions, which only displays one product. In the mini-market concept with a non-traditional concept, it is required to increase revenue where there is only one way, namely increasing sales turnover. The mini-market should take advantage of all the space as a promotional medium as an offline shop.

Indoor digital advertising, which was initially intended to display product promotions to influence consumers, can unwittingly be used as an additional source of income for mini market managers. Potential income is obtained from the number of products displayed as advertisements on digital indoor advertising/digital signage.

Potential income is obtained by selling ad spots based on the duration and selection of broadcast times related to the habit of the
number of visitors. Why is the mini-market the object of this research? This offline shop-house does not have specific market segmentation because the existence of this shop is based more on the number of residents.

Indirectly, product advertisements through the media will benefit producers to become top of mind for product consumers and become a symbiotic mutualism between mini markets and producers.

The implication of this study the outlook digital indoor advertising in mini-market using techno economy analysis: implementation in Indonesia, gives us many perspectives in business development. Measurement of potential product in the market should be calculated with various aspects until commercialization. Positioning this study can be seen from;

Management implications we can see how the product’s competitiveness will increase influential market segmentation if we know the mechanism of development product. Such as stages, we try to look at market gaps by tapping into what factors are the problem in consumer tastes. From that, we can see the needs of consumers in terms of excellence, price and ease in obtaining the product. In this study, we tried to look at promotion by using techno-economic analysis as a tool to see the feasibility of developing a product.

Academic implications will encourage the user, especially the players of digital indoor advertising and policymakers, to develop their product from competition among similar products. This study becomes a starting tool for management/managers in the industry to know the advantages and disadvantages of measuring a product development before entering a market that has a very competitive competition.

CONCLUSION

Digital advertising is believed to be an effective way to increase potential customers globally. Evidence shows that businesses have increasingly switched their advertising focus from traditional to digital media (Fuxman et al., 2014).

The retail business in Indonesia is a profitable business with good prospects for the future. Even though it was hit by a crisis that resulted in almost all economic sectors sluggish, the retail industry could still survive in the future. The growth of Indonesia’s mini-market shows a positive trend of national economic development and shows a high level of competition in the service sector.

The techno-economic approach mainly analyses new technologies for established actors, assuming the traditional industry architectures to be preserved in the future. In summary, techno-economic modelling refers to a set of methods used for evaluating the economic feasibility of complex technical systems. The core of these methods constituted by forecasts for future demand of services provided by a technical system, detailed modelling of the system itself as well as the costs required to set up and maintain it, and discounted cash flow analysis methods combining all the related revenues and costs and calculating NPVs and other financial outputs.

The techno-economic analysis and feasibility analysis results explaining digital indoor advertising business in the mini-market are declared worthy of running. The results obtained to meet the required criteria based on the analysis of cash flows and sensitivity analysis on cash flows deduced. NPV on cash flows amounting to Rp. 3,664,679,991 and NPV sensitivity analysis of Rp. 3,554,930,887 with criteria obtained positive result means worthy of continuing. The results obtained in the IRR of 14.09% (cash flow analysis) and 13.96% (sensitivity analysis), with the criteria obtained more significant than the calculated interest rate, conclude the project is worthy of running. The calculation of the Net B/C ratio obtained more significantly than 1 (> 1), and the payback period is still under the credit application level. It can conclude that the investment condition for this project is worthy of running.
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