

Digital Product Valuation

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ABSTRACT

Why Digital Product Valuation, Important? These are trends indicate a positive outlook for the digital product industry and highlight the importance of digital product valuation in determining the value of these products. So, Digital product valuation is essential for businesses and entrepreneurs who are involved in the development and distribution of digital products. Some reasons why digital product valuation is important that is strategic planning, pricing strategy, investment decisions, intellectual property protection, competitive analysis, financial reporting, and etc. digital product refers to any product or service that is delivered electronically through digital channels, such as the internet or mobile devices. This article will discuss why digital product valuation is important. differences between digital and non-digital products, the differences in their valuation methods, and a simulation using CAGR of digital product valuation in Python.

Keywords: Digital Product; Digital Product Valuation; Python; Industry

INTRODUCTION

A digital product refers to any product or service that is delivered electronically through digital channels, such as the internet or mobile devices. This can include software, applications, online courses, e-books, digital music, videos, and games, among others. Digital products are becoming increasingly popular due to their convenience, accessibility, and cost-effectiveness.

According to several market research reports, the global digital products market is expected to grow significantly several years end. The growth is attributed to various factors such as the increasing adoption of smartphones and internet connectivity, rising demand for digital content, and growing e-commerce industry.

For instance, a report by ResearchAndMarkets.com forecasts the global digital content market to grow at a CAGR of 10.9% during 2020-2025. The report states that the growing demand for online streaming services, digital music, and e-books is driving the growth of the digital content market.

Similarly, a report by Grand View Research predicts the global e-commerce market to reach USD 24.3 trillion by 2025, growing at a CAGR of 11.7% during the forecast period. The report attributes the growth to the increasing penetration of internet and smartphones, rising

consumer preference for online shopping, and growing investments in e-commerce platforms. (Duggan, M. (2021).

According to a report by Google, Temasek, and Bain & Company (2021), the Indonesian digital economy is expected to grow at a compound annual growth rate (CAGR) of 13% from 2020 to 2025, reaching a value of US\$124 billion by 2025. The report also highlights that the e-commerce sector is expected to remain the largest segment of the digital economy, followed by online travel and ride-hailing services. In addition, the report notes that the COVID-19 pandemic has accelerated the adoption of digital products and services in Indonesia.

These are trends indicate a positive outlook for the digital product industry and highlight the importance of digital product valuation in determining the value of these products. So, Digital product valuation is essential for businesses and entrepreneurs who are involved in the development and distribution of digital products. Some reasons why digital product valuation is important that is strategic planning, pricing strategy, investment decisions, intellectual property protection, competitive analysis, financial reporting, and etc.

This article will discuss why digital product valuation is important. It will cover the differences between digital and non-digital products, the differences in their valuation methods, and a simulation of digital product valuation using Python.

Digital Product

Digital products are products that are stored, delivered, and consumed in electronic format, such as software, e-books, digital music, or online courses (Taylor et al.2017). A digital product is a product that is delivered and consumed primarily through electronic channels, such as websites, mobile apps, and other digital platforms (Evans et al., 2019). Digital products are goods or services that are produced, distributed, and consumed in a digital format. They can include software, media, online courses, and e-books, among others (Thies et al. 2016). A digital product is a product or service that is created, delivered, and consumed through digital channels, such as the internet, mobile devices, and social media (Wirtz et al., 2018).

All of the definitions of digital products provided that the commonality that they are products that are created, delivered, and consumed in a digital format. They also all identify examples of digital products, such as software, e-books, digital music, and online courses. Additionally, they all emphasize that digital products are typically accessed and consumed through electronic channels, such as websites, mobile apps, and social media.

Specificly, some definitions focus on the delivery and consumption of digital products through electronic channels, such as websites and mobile apps (Evans et al., 2019; Wirtz et al., 2018), while others emphasize that digital products are stored, delivered, and consumed in electronic format (Taylor et al., 2017; Thies et al., 2016).

Additionally, the types of digital products included in the definitions vary slightly. For instance, some definitions specifically mention software, digital music, and e-books (Taylor et al., 2017), while others mention online courses and media more broadly (Thies et al., 2016).

Overall, while the definitions share many similarities, the slight differences in wording reflect variations in how scholars and practitioners conceptualize and categorize digital products.

A digital product is any product that is primarily comprised of digital content and delivered electronically, either over the internet or through mobile apps. (Investopedia). Digital products are intangible assets or goods that can be sold or distributed online or digitally,

including software, e-books, digital music, streaming videos, and online courses (Shopify). Digital products are products that exist in a digital format, such as a software application, an e-book, a digital image, or an online course. These products are usually sold online and delivered electronically (BigCommerce). Digital products are electronic goods that are created, delivered, and consumed in digital form, such as software, e-books, digital music, streaming videos, and online courses (HubSpot).

There are three different definitions for digital products. Digital products are products that are created, distributed, and consumed in digital form, such as software, e-books, music, videos, and online courses (Source: BigCommerce). Digital products are intangible assets or goods that can be sold or distributed online or digitally, including software, e-books, digital music, streaming videos, and online courses, (Source: Shopify), and Digital products are any products that are delivered digitally and accessed via electronic devices, such as computers, smartphones, and tablets. Examples include software, games, mobile applications, and digital media such as music, movies, and eBooks. (Source: Techopedia)

Digital Product Valuation

Digital product valuation is the process of determining the economic value of a digital product or service (Kulkarni, R.,2016).. Valuation can be based on a variety of factors, including market demand, revenue potential, intellectual property, competition, and user engagement (Kamath, M. V., & Kamath, R ,2017). Proper valuation of digital products is critical for businesses to make informed decisions regarding pricing, investment, and strategic planning (Kumar, P., & Singh, A. K. (2020).

According to Damodaran, A. (2012). The valuation of digital products and non-digital products can differ significantly due to their unique characteristics and the way they generate value. That is: Revenue streams, Intellectual property, Scalability, Network effects, Market competition, different with non digital product characteristic.

Revenue streams refer to digital products often have different revenue streams than non-digital products. For example, digital products may rely on subscription-based models or advertising revenue, whereas non-digital products may rely on sales or licensing fees. Intellectual property, Digital products often rely heavily on intellectual property, such as copyrights, patents, or trademarks. Non-digital products may also have intellectual property, but it may not be as central to the value of the product. Scalability, digital products can often be scaled more easily than non-digital products, allowing for rapid growth and potentially higher valuations. Non-digital products may have more physical constraints that limit scalability. Network effects, Digital products can often benefit from network effects, where the value of the product increases as more users join the network. Non-digital products may not have this same benefit. Market competition: Digital products may face greater competition due to the ease of replication and low barriers to entry in the digital space. Non-digital products may have more traditional barriers to entry, such as high capital requirements or regulatory hurdles.

Valuation digital products and non-digital products requires a careful consideration of these and other factors. Traditional valuation methods, such as discounted cash flow analysis and market-based approaches, may need to be adjusted or supplemented with alternative methods to account for the unique characteristics of each type of product.

WHY DIGITAL PRODUCT VALUATION IMPORTANT

Digital product valuation is essential for businesses and entrepreneurs who are involved in the development and distribution of digital products. Some reasons why digital product valuation is important that is strategic planning, pricing strategy, investment decisions, intellectual property protection, competitive analysis, financial reporting, and etc.

Digital product valuation is essential for businesses and entrepreneurs who are involved in the development and distribution of digital products. Here are some reasons why digital product valuation is important:

- **Pricing strategy:** Valuation helps determine the appropriate price for a digital product. This is critical to ensure that the product is profitable and remains competitive in the market.
- **Investment decisions:** Valuation helps businesses make informed investment decisions about digital products. This can include decisions about product development, marketing, and distribution. Digital product valuation helps investors and entrepreneurs make informed decisions about investing in or acquiring digital products. It provides them with a clear understanding of the value of a product, which can help them determine whether it's worth investing in or not.
- **Intellectual property protection:** Valuation can help determine the value of a digital product's intellectual property, such as patents, trademarks, and copyrights. This information is useful for protecting the product's intellectual property rights. Valuation of digital products is also important for intellectual property protection. A clear understanding of the value of a product can help companies protect their intellectual property rights and prevent infringement
- **Strategic planning:** Valuation can provide insights into a digital product's revenue potential, growth prospects, and market share. This information is essential for strategic planning and decision-making. Digital product valuation can also inform strategic planning. By understanding the value of their digital products, companies can make informed decisions about product development, marketing, and pricing strategies
- **Competitive analysis:** Valuation can provide insights into the value of a digital product compared to its competitors. This information is useful for identifying competitive advantages and disadvantages.
- **Financial reporting:** Digital product valuation is also important for financial reporting purposes. Companies need to accurately value their digital products in order to report their financial statements correctly and comply with accounting standards
- **Negotiation:** Digital product valuation is useful in negotiation processes. For example, in the case of mergers and acquisitions, the valuation of digital products can help to determine a fair price for the products being acquired

Comparison Digital Product and Non-Digital Product

Digital product valuation and non-digital product valuation differ in several ways. First, the valuation of digital products is often based on different metrics compared to non-digital products. For example, the value of a software product may be determined by factors such as the

number of active users, the rate of user growth, and the recurring revenue generated by the product. In contrast, the value of a physical product may be determined by factors such as production costs, inventory levels, and sales volume.

Second, the valuation of digital products often involves a higher level of uncertainty and risk compared to non-digital products. Digital products may be subject to rapidly changing market conditions, evolving technology, and changing consumer preferences. This can make it difficult to accurately forecast the future revenue and growth potential of digital products, and can increase the level of risk associated with these valuations.

Third, the valuation of digital products may involve different valuation methods and approaches compared to non-digital products. For example, the income approach may be more commonly used in valuing software products, while the market approach may be more commonly used in valuing physical products.

Overall, while the fundamental principles of valuation apply to both digital and non-digital products, there are significant differences in the metrics, risk factors, and valuation methods used for these types of products.

There are some examples of digital and non-digital products and how their valuation might differ:

Digital Product Valuation:

- Software-as-a-Service (SaaS) company: A SaaS company's valuation may be based on factors such as monthly recurring revenue (MRR), customer acquisition costs, and churn rate.
- Social media platform: A social media platform's valuation may be based on factors such as the number of active users, engagement rate, and advertising revenue.

Non-Digital Product Valuation:

- Automotive manufacturer: An automotive manufacturer's valuation may be based on factors such as production costs, inventory levels, and sales volume.
- Consumer goods company: A consumer goods company's valuation may be based on factors such as brand recognition, market share, and distribution channels.

While the fundamental principles of valuation apply to both digital and non-digital products, the metrics, risk factors, and valuation methods used for these types of products can differ significantly.

Let's consider the valuation of a SaaS (Software as a Service) company that provides a project management tool for small businesses. The valuation may be based on factors such as the number of active users, monthly recurring revenue, growth rate, and customer acquisition costs. The income approach may be used to value the company, by projecting future cash flows and discounting them to their present value using an appropriate discount rate. The valuation may also take into account the competitive landscape, technology trends, and the potential for future product development.

Table 1

example table comparing the valuation factors for a digital product (a SaaS company) and a non-digital product (a manufacturing company):

Valuation Factor	Digital Product (SaaS)	Non-Digital Product (Manufacturing)
Revenue	Monthly recurring revenue, revenue growth rate	Total revenue, gross profit margin
Customer Base	Number of active users, churn rate	Number of customers, customer retention rate
Market Competition	Number of competitors, market share	Number of competitors, market share
Technology Trends	Emerging technology, potential for future development	Emerging technology, potential for future development
Risk Factors	Rapidly changing market conditions, evolving technology, changing consumer preferences	Supply chain risks, production capacity, regulatory compliance
Valuation Methods	Income approach, market approach	Market approach, cost approach

Simulation

There are several methods that can be used for the valuation of digital products, depending on the nature of the product and the specific circumstances of the company. Some commonly used methods for digital product valuation include:

- **Income Approach:** This method is based on the future cash flows generated by the digital product. It involves projecting the future revenue streams and discounting them to their present value using an appropriate discount rate. This method is often used for digital products that generate recurring revenue streams, such as SaaS companies or subscription-based businesses.
- **Market Approach:** This method involves comparing the company's financial metrics to those of similar companies in the industry. For digital products, this may involve analyzing metrics such as user engagement, conversion rates, and customer acquisition costs. This method is useful for valuing digital products that operate in a competitive market.
- **Cost Approach:** This method involves estimating the cost of developing or reproducing the digital product. For digital products, this may include the cost of software development, hosting, and maintenance. This method is useful for valuing digital products that have a significant asset base or require significant investment in technology.
- **Real Options Approach:** This method involves valuing the flexibility or optionality associated with a digital product. For example, a digital product may have the option to expand into new markets or add new features in the future. This method is useful for valuing digital products that have significant potential for future growth or expansion.

It's important to note that the choice of valuation method will depend on the specific circumstances of the digital product being valued and the preferences of the valuator.

There are some examples of how different methods might be used to value digital products. That is. Income Approach. An online software-as-a-service (SaaS) company that charges a monthly subscription fee might be valued based on the present value of its expected future cash flows. Market Approach. A digital marketplace company that connects buyers and sellers might be valued based on the valuation of similar publicly-traded companies in the same market. Cost Approach. A company that has developed proprietary software might be valued based on the cost of developing the software, adjusted for any necessary updates or maintenance.

For Example Case study Income Approach. The income approach is a common method for valuing digital products, particularly those with a recurring revenue model such as SaaS (Software as a Service) companies. This approach calculates the value of the company based on its future cash flows, discounted to their present value using an appropriate discount rate.

We're valuing a SaaS company that provides a project management tool for small businesses. The company has 10,000 active users, with a monthly subscription fee of \$50 per user. Based on historical data and future projections, the company is expected to have a revenue growth rate of 20% per year for the next five years, with a 70% gross profit margin and a 30% operating expense ratio.

To value the company using the income approach, we would project the company's future cash flows over the next five years, and discount them back to their present value using a discount rate that reflects the risk associated with investing in the company. The resulting discounted cash flow (DCF) value would provide an estimate of the company's total enterprise value.

Simulasi With Coding Python

This simulation using CAGR Model. CAGR stands for Compound Annual Growth Rate, which is a measure of the annual growth rate of an investment over a specified period of time. It is often used to compare the performance of different investments or to forecast the future performance of an investment.

The CAGR formula takes into account the effects of compounding, which means that the returns earned on an investment in each year are reinvested and added to the principal for the following year. This allows for exponential growth over time, which can be useful in understanding the long-term potential of an investment.

The CAGR formula is:

$$\text{CAGR} = (\text{End Value} / \text{Start Value})^{(1/n)} - 1$$

Example of how to predict the valuation of a digital product using the compound annual growth rate (CAGR) in Python

```
=====Begin
coding=====

import pandas as pd
import numpy as np

# Define a dataframe with the historical revenue data for the digital product
revenue_data = {'Year': [2016, 2017, 2018, 2019, 2020],
                 'Revenue': [100000, 120000, 150000, 180000, 220000]}

df = pd.DataFrame(revenue_data)

# Calculate the CAGR for the past five years
start_value = df.iloc[0]['Revenue']
end_value = df.iloc[-1]['Revenue']
years = len(df)
CAGR = ((end_value/start_value)**(1/years))-1

# Predict the revenue for the next five years using the CAGR
next_years = 5
forecast_values = [end_value*(1+CAGR)**i for i in range(1,next_years+1)]

# Add the forecast values to the dataframe
for i in range(next_years):
    year = df.iloc[-1]['Year'] + i + 1
    value = forecast_values[i]
    df = df.append({'Year': year, 'Revenue': value}, ignore_index=True)

print(df)
=====end
coding=====
```

The above Python code calculates the future valuation of a digital product based on its current valuation and the expected CAGR (Compound Annual Growth Rate). The user inputs the current valuation and the expected CAGR, and the code calculates the future valuation for a 5-year period.

The calculation is done using the formula: $\text{future_valuation} = \text{current_valuation} * (1 + \text{CAGR})^n$, where n is the number of years (in this case, 5).

For example, if the current valuation of a digital product is \$100,000 and the expected CAGR is 15%, the code will output the future valuation for each year in the 5-year period:

Year 1: \$115,000
Year 2: \$132,225
Year 3: \$152,084
Year 4: \$174,897
Year 5: \$201,043

The current value of a digital product is \$100,000 and we want to predict its value in 5 years using a CAGR of 10%. We would calculate the future value as:

$$\text{Future Value} = \$100,000 * (1 + 0.1)^5 = \$161,051$$

This means that we predict the digital product to be worth \$161,051 in 5 years if it maintains a CAGR of 10%.

This calculation can be useful for predicting the future growth and valuation of a digital product, which can inform business decisions and investment strategies.

Digital product valuation can involve many complex factors, especially when it comes to digital products. Here are some references that discuss the factors that can affect digital product valuation:

Some of the factors that can affect digital product valuation include:

- Market size and competition
- User base and engagement
- Growth potential and scalability
- Intellectual property protection and licensing
- Revenue streams and pricing models
- Technology and development costs
- Regulatory and legal environment
- Risk and uncertainty

Valuation models and methods can also vary depending on the type of digital product being valued, such as mobile apps, software as a service (SaaS), or e-commerce platforms. Therefore, it is important to consider multiple factors and use a combination of valuation approaches to arrive at a more accurate valuation for a digital product.

There is an example of how multiple factors can affect the valuation of a digital product:

we are valuing a mobile app that provides a subscription-based service for online fitness training. Here are some of the factors that could affect its valuation:

- Market size and competition: The app operates in the online fitness training market, which is estimated to be worth \$15 billion globally. However, there are several established players in the market, such as Fitbit, Nike Training Club, and Peloton, which could affect the app's ability to gain market share.
- User base and engagement: The app has 100,000 registered users, with an average engagement rate of 3 sessions per week and an average session length of 30 minutes. However, there is a high churn rate of 30% due to competition and user preferences for in-person training.
- Growth potential and scalability: The app has recently expanded its services to include personalized nutrition plans and has plans to integrate wearable technology for tracking progress. However, it may face scalability issues with maintaining personalized training plans for a growing user base.
- Intellectual property protection and licensing: The app has patented its proprietary algorithms for personalized training plans and has secured exclusive licensing agreements with fitness equipment manufacturers for integrating their products into the app. However, there is a risk of patent infringement from competitors.

- Revenue streams and pricing models: The app generates revenue through monthly subscription fees of \$20 per user. However, it faces pricing pressure from low-cost or free alternatives and may need to offer additional premium features to maintain revenue growth.
- Technology and development costs: The app requires continuous investment in development and maintenance of its technology infrastructure and updates to its training content and algorithms. This incurs significant costs that may affect profitability.
- Regulatory and legal environment: The app may need to comply with privacy laws and data protection regulations, especially in handling sensitive user health data.
- Risk and uncertainty: The app's valuation may be affected by macroeconomic factors, such as changes in consumer behavior or disruptions to the fitness industry due to pandemics or other unforeseen events.

All of these factors, and more, need to be considered when valuing a digital product. The valuation model and method should also reflect the unique characteristics and risks of the digital product and its industry.

DISCUSSION

The challenges and risks associated with valuing certain types of businesses that are, distressed, or complex. Valuing these types of businesses can be particularly difficult because there is often limited or incomplete information available, and the risks associated with the business may be difficult to quantify.

Distressed businesses may have significant financial or operational issues that need to be addressed, and valuing such businesses requires a careful assessment of the potential costs and risks involved in turning the business around. Finally, complex businesses may have multiple business lines or subsidiaries, making it difficult to assess the overall value of the business.

Complex businesses requires a thorough understanding of the business and its industry, as well as an appreciation of the risks involved. It often involves a combination of quantitative and qualitative analysis, and may require the use of alternative valuation methods or adjustments to traditional valuation models. Aswath Damodaran. (2012) said in valuation digital product is "The dark side of valuation. In addition to the above valuation methods, there is a method commonly used in service products, which is Willingness to Pay. This method may also be used to assess the valuation of digital products.

It's important to note that predicting future values using CAGR is just one method of valuation and should be used in combination with other methods to get a comprehensive understanding of a digital product's worth. Additionally, predicting future values is inherently uncertain and subject to various market and economic factors, so it's important to approach predictions with caution and regularly update them as new information becomes available.

CONCLUSION

This research highlights the importance of digital product valuation in the context of the digital product industry. The positive trends observed in the industry emphasize the need for businesses and entrepreneurs to accurately determine the value of their digital products. Digital product valuation plays a crucial role in strategic planning, pricing strategy, investment

decisions, intellectual property protection, competitive analysis, and financial reporting. It enables businesses to make informed decisions and maximize the value of their digital products. Additionally, the research discusses the differences between digital and non-digital products in terms of valuation methods and provides a simulation using the Compound Annual Growth Rate (CAGR) in Python to showcase the application of digital product valuation. Overall, this study emphasizes the significance of digital product valuation for individuals and organizations involved in the development and distribution of digital products.

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