Analysis of Structure, Behavior and Performance of Communications Technology Industry Companies

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Abstract: The communications technology industry is a dynamic industry and is always changing along with developments in the business environment. Technology companies often learn new individual needs as quickly as possible which forces companies to innovate business models, and this industry has promising prospects because the market is getting bigger. The aim of this research is to analyze the structure, behavior and performance of companies that dominate the communications technology industry. This research uses secondary data with qualitative and quantitative approaches obtained directly through intermediary media. The sample collection method used was the non-participant observation method. Data analysis techniques use concentration ratio analysis, HHI index test, descriptive analysis. The results of this research show 1) The market structure of the communications technology industry is proven to be an oligopoly. 2) The market structure in the communications technology industry is influenced by company behavior. 3) Market structure and company behavior influence company performance. The implications of this research are that structure, behavior and performance influence each other in the communications technology industry.

Keywords: Technology Companies; SCP Theory; Concentration Ratio; IHL

INTRODUCTION

Technological developments are increasingly rapid along with the times that increasingly demand ease in carrying out various activities, giving rise to various new technologies to meet human needs. In the past, people still relied on conventional media to communicate, such as using letters and landlines. Meanwhile, to get information via television, radio or print media. So with the development of increasingly sophisticated and complex technology, new technology has emerged to meet human needs. This technology is the internet. Through the internet someone can send *e-mail* , search for information, play, buy goods and much more (Dewi & Suprapti, 2014) .

People's lifestyles have developed to become more modern, practical and want convenience in all their activities (Parastanti et al., 2014) . Community activities can now be made easier just by using a device connected to the internet. One of these devices is a smartphone. Smartphones which were originally only used for communicating and sending messages have developed rapidly with all their features. When running a smartphone, there must be an application, because the application itself is an important feature in a smartphone. The large number of smartphone users makes Indonesia a large market share for applications to gain users.

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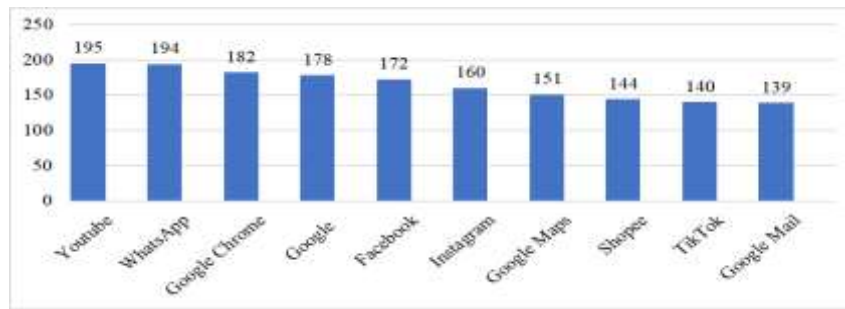
Source: AI Data, 2023

Figure 1.

Number of applications with active users above 100 million in Indonesia for the period August

2022 - September 2023

Through the application, users can access a number of important information using a smartphone connected to internet services. The main advantage of the application is that it makes it easy for users to obtain information *portablely* without using a computer device and its use in obtaining up-to-date and fulfilled information without being hindered by the time and place of the smartphone device user and the area that can be reached by the internet communication network (Wardana, 2016) . The technology sector has very good prospects because it will continue to have the potential to develop with the times. However, it also really depends on a technology company in developing the application. Figure 1.4 shows that currently applications in Indonesia with 100 million active users are owned by 4 technology companies.

Source: AI Data, 2023

Figure 2.

Market share of communications technology companies that control applications with 100

million active users in Indonesia for the period August 2022 – September 2023

The digital era offers both opportunities and challenges for companies in the technology industry, the increasing number of platform businesses being accelerated by the digitalization trend. There is intense pressure on technology companies to stay at the top. New technological innovations such as cognitive computing and digital reality are causing changes in the business world.

Table 1 Total revenue of technology companies (worldwide)

Year	Company							
	Alphabet	%	Meta	%	Sea Limited	%	Byte Dance	%
2013	$55,519	-	$7,872	-	-	-	-	-
2014	$66,001	17	$12,466	37	-	-	-	-
2015	$74,989	12	$17,928	30	$0.292	-	-	-
2016	$90,272	17	$27,638	35	$0.346	16	-	-
2017	$110,855	19	$40,653	32	$0.414	16	-	-
2018	$136,819	19	$55,838	27	$0.827	50	$7,000	-
2019	$161,857	15	$70,697	21	$2,175	62	$17,000	59
2020	$182,527	11	$85,965	18	$4,376	50	$34,000	50
2021	$257,637	29	$117,929	27	$9,955	56	$62,000	45
2022	$282,836	9	$116,609	-1	$12,450	20	$98,000	37

Source: Macrotrends & Sacra, 2023

The communications technology industry is a dynamic industry and is always changing along with developments in the business environment, and this industry has promising prospects because the market is getting bigger (Sugama, 2016) . Technology companies have many opportunities that can increase the company's ability to innovate existing business models or create new business models. Information technology's reliance on systems causes companies to have to focus not only on their competitors but also on their collaborators. Thus, companies form alliances, cultivate partners, and ensure compatibility (Shapiro & Varian, 1999) . As well as, carrying out several market changes such as re-platforming, digital talent acquisition, and cyber resilience which greatly influence the future of the organization (Stoian & Tohanean, 2020) . Based on the background of the problem and the problem formulation, the objectives to be achieved from this research include 1) To determine the structure of companies in the communications technology industry in Indonesia. 2) To determine the behavior of companies in the communications technology industry. 3). To determine company performance in the communications technology industry.

RESEARCH METHODS

This research is causal associative research using a quantitative approach, namely research that aims to determine the influence between two or more variables using quantitative techniques. This research will use a case study that will describe the structure, behavior and performance of companies in the communications technology industry using the SCP (Structure-Behavior-Performance) theory. Researchers chose to use trusted online data site sources, namely Data AI, Macrotrends, Sacra and adapt. The object of this research is the

communications technology industry to analyze the structure, behavior and performance of communications technology companies. In this research, the variables used to support this research are market share, mergers and acquisitions, profits.

This research uses a descriptive analysis method that explains the structure, behavior, performance, communication technology industry and quantitative data using several methods, including: using the SCP approach. The stage in testing the industrial structure is to use the concentration ratio (CR), HHI index test.

To calculate CR, use the formula:

$$CR = \Sigma^N i = 1\ Si \ldots\ldots\ldots (2)$$

Information:

N   = Number of companies

Si   = Market *Share*

To calculate *the Herfindahl Hirschman Index,* it is formulated as follows:

$$HHI = \sum_{1}^{n} = 1\ Si^2 \ldots\ldots\ldots (3)$$

Information:

Si   = 1,2,3,….n (Market share of each company)

n   = Number of companies observed

Linking the results of previous industrial structure identification, this research identifies industrial behavior in accordance with SCP theory which includes qualitative data that explains the time sequence of company behavior events. In identifying industry performance, sources of income will be used using available data.

RESULTS AND DISCUSSION

Table 2 Market Share of 8 Communication Technology Companies for the period September 2022-August 2023

No.	Company	Market Share (%)
1	Google Inc.	45
2	Meta Platforms	25
3	ByteDance	9
4	Sea Limited	6
5	GoTo Group	6
6	Telegram	4
7	Telkomsel	3
8	Kingsoft Office Software	2

Source: AI data, 2023 (processed data)

In Table 4.3, one of the market share calculation results for that period is presented for 8 companies whose applications are included in the top 20 applications with the highest number of active users in Indonesia. Data was obtained through AI data sources and has been processed by researchers. The concentration ratio (CR) variable calculation uses market share variable

calculations *from* data from 8 companies for the research time period September 2022-August 2023 with the basic formula being:

$$CR4 = 45\% + 25\% + 9\% + 6\% = 85\%$$

Based on these results, the CR4 value was 85%. According to Joe S. Bain in (Meideline & Sukadana, 2023) . The results of calculating the concentration ratio of four companies in the communications technology industry during the period September 2022 - August 2023 amounted to 85%, which is classified as having a full Oligopoly type IB oligopoly market structure where the companies have a market share of up to 90 percent. The CR8 value reaches 95 percent, this shows that the eight companies are classified as type IB oligopolies.

Calculation of the Herfindahl-Hirschman Index (HHI) using the overall market share which has been squared from data from 8 companies for the research time period September 2022 – August 2023 with the basic formula being:

$$\mathbf{HHI} = 2{,}025 + 625 + 81 + 36 + 36 + 16 + 9 + 4 = \mathbf{2{,}832}$$

Based on the table above, by calculating the HHI value, it is found that the HHI value for the container industry is 2,832 percent. In general, according to the Business Competition Supervisory Commission (KPPU), in its merger guidelines, it divides the level of market concentration into two spectrums based on the HHI value. Spectrum I (low concentration) with an HHI value below 1,800 and spectrum II (high concentration) with an HHI value above 1,800 (KPPU, 2020) . Calculation results in Table 4.10. it can be concluded that Spectrum level I is with low concentration. Likewise, according to the US Department of Justice & FTC, HHI values between 1,500-2,500 are moderately concentrated, and HHI values of more than 2,500 are highly concentrated (Justice, 2018) . So from the results of the HHI calculation for this technology industry, it is 2,832 percent, which is the size of the companies in the relatively highly concentrated market.

To identify the behavior of the communications technology sector industry, this research uses a qualitative approach by looking at the time sequence of events in company behavior in carrying out mergers or acquisitions through websites or news. Alphabet Inc. via Google Inc. itself in the 2013-2022 period has invested, acquired 297 companies, followed by Meta Platforms with a total investment, acquiring 56 companies, ByteDance with a total investment, acquiring 58 companies, and Sea Limited has invested, acquiring a total of 16 companies.

Meanwhile, in supporting overall product differentiation, technology companies also often develop other products that do not only focus on their core business. The diversification strategy is designed to maintain its dominant position in the technology industry so that it can

maximize profits, and can also encourage innovation by running stable and established new businesses and high-risk innovative ventures simultaneously.

Alphabet Inc. via Google has made more acquisitions than any other technology company for several reasons. Google has a culture of experimentation and is willing to invest in new technologies and businesses. This acquisition was instrumental in enhancing Alphabet's offerings and services, allowing the company to expand its ecosystem and business. Google's acquisition of Waze in 2013 provided an opportunity for an application made by Google that focuses on navigation services, namely Google Maps. This acquisition allows Google to enhance its mapping services with a wealth of *real-time data* regarding the best driving routes to avoid traffic jams, which is a strategic advantage offered by Waze (Kela-Madar, 2021) . This is in accordance with Figure 1 which shows that the Google Maps application is ranked 7th as the application with the highest number of active users in Indonesia with 151 million users.

Facebook's acquisition of WhatsApp in 2013 had an impact on Facebook's market share in the social media and messaging space. This acquisition also allowed Facebook to enhance its mobile messaging capabilities, as WhatsApp is known for its user-friendly interface and commitment to encryption (Glick & Ruetschlin, 2019) . Facebook's acquisition of WhatsApp and Instagram, which have a large number of active users, led to Meta Platform Inc. can control 25% market share.

ByteDance acquired Musical.ly and merged with TikTok in 2018, resulting in ByteDance gaining access from Musical.ly to overseas youth markets which played an important role in its rapid growth and global expansion (Zeng *et al.* , 2021) . The acquisition of Musical.ly caused TikTok to grow which affected ByteDance's market share. It can be seen that the number of active TikTok users combined with CapCut caused ByteDance to control 9% of the market share

The acquisition by Sea Limited aims to diversify its offerings and services, thereby enabling the company to compete with other technology giants in the industry. This acquisition has also become a competitive tool for Sea Limited as it has helped the company enter new markets and expand its ecosystem. The acquisition of Bank BKE had a significant impact on Sea's market share in the financial technology sector (Iwamoto, 2021) .

Google expands and diversifies to acquire or develop new products or services that are unrelated to existing products but remain within the scope of the company's financial, technological and marketing experience (ŞEKERLİ & AKÇETİN, 2018) . In 2015, Google formed a company called Alphabet Inc. as a holding company that collects various subsidiaries that offer products outside Google's main business lines.

Meta Platforms differentiates its products from competitors through its diverse product portfolio, which includes several well-known social media applications and initiatives aimed at building the metaverse. Meta's focus on community building and its innovative technologies, such as virtual reality and *augmented reality* , set it apart from other tech giants like Google. Meta owns and operates Facebook, Instagram, WhatsApp, Messenger, Oculus, and other products, each serving different purposes in social media and communications. Meta is also investing heavily in virtual reality and augmented reality technology, seeking to develop immersive experiences and advance the *metaverse concept* . Meta's strategy includes making strategic acquisitions to diversify products, investing in research and development to stay ahead of emerging trends and technologies, and developing strong partnerships with complementary businesses to expand its services (Alonso, 2022) .

ByteDance differentiates its products by looking for new product opportunities widely and not hesitating to send many teams to the same segment. The company famously launched 12 entertainment content apps in its first few months as a company, and 20 apps to test overseas market opportunities in 2015. ByteDance allocates key resources to a few select priorities for several years at a time. (Lyu *et al* ., 2023) .

Sea Limited's business diversification was carried out by acquiring Bank BKE and changing the bank's name to SeaBank. This step is part of Sea's strategy to expand its financial service offerings and strengthen its position in the digital banking landscape in the Southeast Asia region. In addition, Sea will also make new investments in technology companies over the next few years. With Sea Capital investing in the growth of the broader ecosystem, it is hoped that it can help accelerate the growth of the digital economy as a whole and create real and lasting value for users, business partners , and the Sea Limited community. Sea will also build an artificial intelligence laboratory under the leadership of a newly assigned scientist. The laboratory intends to develop insights and technology related to existing businesses and new opportunities outside them (Tani & Iwamoto, 2021) .

Table 3 Technology Company Income Sources

Sources of Company Income in 2022 (U$)				
	Alphabet	Meta	Sea Limited	ByteDance
Advertising	224,473	113,642	N/A	N/A
Digital Entertainment	N/A	N/A	3,877	N/A
Ecommerce	N/A	N/A	7,463	N/A
Other services	58,363	2,967	1,109	N/A
Total	282,836	116,609	12,449	N/A

Source: Company Financial Report, 2024

Alphabet Inc., Google's parent company, generates revenue primarily through advertising and cloud services. Meta Platforms generates revenue primarily through advertising on its social media platforms. Meanwhile, currently ByteDance, the author has not

received the company's official financial report, because the company is not currently a public company. But sources from Sacra, a research site for private companies, say TikTok's parent company generates revenue primarily through advertising and *e-commerce* . In contrast to the other 3 companies, most of Sea Limited's revenue comes from its digital entertainment business, Garena. followed by e-commerce and other services (including SeaMoney), and sales of goods (mainly from Shopee).

Based on table 1, it can also be seen that technology company revenue growth will decline in 2022 due to several factors such as economic uncertainty. Companies cut their advertising budgets which negatively impacted the revenues of technology companies that rely heavily on advertising, such as Google, Meta (Barnett, 2024) .

By showing that the communications technology industry has high concentration. The results of this research are in accordance with the results of research conducted by Abdul Azizi, Abas Hidayat, Ellinoleh with the title " *Oligopoly Market and Monopolistic Competition in the Digital Era: Shariah Economic Perspective* " (2023) which explains that innovation in technology gives rise to oligopoly markets. Meanwhile, according to (Saptono, 2017) shows that the size of the share can be determined by merger and acquisition behavior. Oligopoly is formed due to mergers and acquisitions due to market concentration controlled by a few companies.

Based on research on this matter, it can be assessed that technology companies carry out merger and acquisition behavior to expand and diversify their products so that they can increase their market share which provides more income for the company. Currently, the most frequently used and considered effective marketing method is through digital marketing. Companies consider digital advertising to be more effective than traditional advertising because it is easier to track, making it possible for companies to know which digital advertising medium is successful for them and provides the expected results (Tyas & Aryani, 2017) .

So, Alphabet Inc.'s revenue the highest is a result of the company's market share structure being the largest, where the company can have a large market share due to large investment behavior, mergers and acquisitions, so that Alphabet Inc has many products on offer with a large number of active users , thus increasingly attracting advertisers to advertise through Alphabet Inc. products. Likewise, Sea Limited has the lowest revenue compared to the other 3 companies, this is because the company's market share is still low, and the investment behavior, mergers, acquisitions and product services carried out are still small.

CONCLUSIONS AND SUGGESTIONS

Based on the results of the analysis and discussion previously published, several conclusions can be concluded, namely as follows: The market structure of the communications technology industry is proven to be an oligopoly. The results of this study are in accordance with the calculation of the concentration ratio (CR), Herfindahl-Hirschman Index (HHI). The industrial market structure is influenced by the behavior of companies in the communications technology industry. Using the SCP paradigm, the results show that investment behavior, mergers, acquisitions and product differentiation influence the market structure of the communications technology industry. Market structure and company behavior influence the revenue performance of companies in the communications technology industry. The calculation results show that the revenues of the 4 companies with the largest market share in the technology industry are influenced by the number of product services offered. By considering the results of the study in this research, there are several suggestions put forward, namely evaluating regulations as a whole in this industry in the next research in order to obtain proposals for adjusting regulations and policies that can truly support optimal growth of the communications technology industry because this industry will continues to develop, there is a need to improve regulatory arrangements regarding mergers, acquisitions and consolidation which result in monopolistic practices and fair business competition.

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