

# Lesson Learned in Comparative Analysis of Global Business Strategy to Commercialize Wi-Fi Router Technology

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## Abstract

Wi-Fi router technology develops every year in line with people's need for internet and smartphone penetration. Wi-Fi has become the preferred means for connecting to the internet at home, in the office, in hotels, and at airports. Sales of Wi-Fi routers are increasing every year, so that research related to Wi-Fi routers is interesting for further research. This research will discuss the global business strategy of commercializing Wi-Fi router technology by looking at companies that have successfully compete globally. The companies studied were TP-Link router and Tenda router. In designing a global strategy, companies must decide how to change or adopt a core business model to achieve above-average returns. The analysis was conducted by referring to the strategic management approach to determine the design of global business strategies by the two companies to obtain above-average returns. The paper highlights the resources, capabilities, and competitive advantages of both companies. This study provides recommendations regarding what can be learned from both companies for companies in Indonesia that want to develop business in the area of Wi-Fi router technology.

## Keywords

A comparative study, Global business strategy, Lesson learned, and Wi-Fi router

## 1. Introduction

Wi-Fi has become the preferred means for connecting to the internet – at home, in the office, in hotels, and at airports. Increasingly, Wi-Fi also provides internet access for remote communities, where it is deployed by volunteers in community-based networks, by operators in 'hotspots', and by municipalities in 'hot zones' (Lemstra et al. 2010). Even the cheapest laptop no longer needs a cable to access the internet; we just walk into a place and, somehow, magically, the device we are carrying connects automatically with a Wi-Fi hot spot. This happens in cafes, at home, on a train, on a plane. Wi-Fi routers are everywhere, to the point where it feels odd when we find a spot where we actually cannot find a Wi-Fi hot spot to watch movies, stream music, search the internet, or do emails (Healy 2019). Consumer-grade broadband routers are integral to accessing the internet and are primarily responsible for the reliable routing of data between networks (Szewczyk and Macdonald 2017). A router is a hardware device that connects several computers and other devices to a single Internet connection known as a home network. Many routers are wireless, allowing the creation of a home wireless network,

commonly known as a Wi-Fi network (Gcfglobal 2018). A wireless router is a device that performs the functions of a router and also includes the functions of a wireless access point. It is used to provide access to the internet or a private computer network. Depending on the manufacturer and model, it can function in a wired local area network, a wireless-only LAN, or a mixed wired and wireless network (Wikipedia 2021).

Worldwide revenue for the combined consumer and enterprise wireless local area network (WLAN) market segments increased 17.9% year over year in the fourth quarter of 2020 (4Q20). It grew 10.3% for the entire year, according to results published in the International Data Corporation (IDC) Worldwide Quarterly WLAN Tracker. The enterprise segment grew revenues an impressive 10.3% year over year in 4Q20 to reach \$1.86 billion and 1.9% for the full year 2020, reaching \$6.35 billion. Overall unit shipments in the enterprise WLAN market grew 14.0% in 4Q20 compared to a year earlier (IDC 2020).

At the moment, TP-Link owns about 40 percent of the global market share for home Wi-Fi routers, according to IDC, with 30 percent of its total in Europe. With about 10 percent of its business in North America, TP-Link sees the United States, Canada, and Mexico as its biggest sales challenges in 2016 and beyond (Eweek, 2016). TP-Link has been redefining the way we think about wireless networks for over 20 years. By focusing on reliability and performance, the manufacturer can boast a product portfolio where everyone can find something for themselves, at any requirements and budget. By placing the customer first, products with this brand have gained the trust of hundreds of millions of people in more than 120 countries, making the company the global leader in the WLAN market (Dipolnet 2021).

TP-Link competitor Tenda, founded in 1999, Tenda technology is the recognized leading supplier of networking devices and equipment. Tenda has committed to delivering easy-to-install and affordable networking solutions, offering innovative, cutting-edge products to realize people's intelligent life. Combined R&D, manufacturing & sales together, Tenda adopts the latest technology and professional service system to establish a reliable network to be a professional high-tech company in the world. Tenda products include home networking, business networking, switch, broadband CPE, gateway, powerlines, mobile broadband, and IP camera. Excellent performance, steady signal, easy use and installation, top quality with competitive price are the common features of all Tenda products. Tenda attracts a lot of excellent talents by its cooperate culture. Nearly 120 graduates from key universities join Tenda each year. They contribute a lot to Tenda's development. Since 2007, Tenda has started launching its global branding strategy. Through worldwide distribution channels, Tenda distributes products to more than 100 countries around the world. Up to the third quarter of 2014, the total sales amount of Tenda is over 500 million (Tenda 2021).

Table 1. Market Capacity and target sales TP-Link vs Tenda (Jimmy 2015)

Area	TP-Link/ Per Month (pcs)	Tenda/ Per Month (pcs)
Middle East & Africa	32.000	10.000
Asia	20.000	5.000
Latin Amerika	21.000	2.000
North Amerika	8.000	500
Europe	31.000	2.000

Table 1 shows the comparison in market capacity and target sales TP-Link vs. Tenda. Based on some data above, the Wi-Fi router market is enormous and growing. So this research studies how to develop and implement a global business strategy for technology commercialization, based on a case study comparison of the two companies. This study aims to provide insights to companies in Indonesia that want to start a Wi-Fi router business and recommendations that can be learned from the two companies.

There are several previous studies on comparative analysis of global business strategy. Aqidawati et al. (2020) examine lessons learned in developing and implementing a global business strategy to commercialize battery swap technology. This study provides recommendations regarding what can be learned by companies that want to develop business in the area of battery swap technology for electric vehicle applications. Istiqomah et al. (2020) researched lessons learned of business strategy for commercializing an e-motor cycle technology. This research provides priorities that can be used for start-up-based technology to commercializing an e-motor cycle. This research explores a successful company's innovation system and technopreneurship as a lesson learned of business strategy. This study produces a proposed model for manufacturing the e-motor cycle for successfully commercializing technological innovations. Khofiyah et al. (2020) researched the global business strategy for commercializing a technology of drones. This research discusses the global business strategy of commercializing drone technology by looking at companies that have successfully competed globally. Based on

previous research, neither has been studied on global strategy for commercializing Wi-Fi router technology. Thus, this paper provides a study on developing and implementing a global business strategy for commercializing Wi-Fi router technology, based on a comparative study between two companies. This study aims to provide recommendations regarding what can be learned by companies in Indonesia to achieve success in commercializing Wi-Fi router technology.

## **2. Literature Review**

### **2.1. Global business strategy concept**

In a global business environment, companies or firms have to identify, formulate, and execute business strategies under the geographical, political, and related environments they operate. Therefore, the Global Business Expansion strategy should always initially focus more on Organic growth within the home country and later with emphasis on in-depth research on supply chain management, distribution challenges, and novel retail strategies on countries in which it wants to expand. However, the increasing competition and rising pressure of globalization have triggered the Corporate and Academics to rethink the formulation of global business strategy (Kasanagottu and Bhattacharya 2018).

Ghoshal (1987) says that global strategy involves thinking in an integrated way about all aspects of a business, its suppliers, production sites, markets, and competition. It means meeting world standards even before seeking world markets and being world-class even in local markets. It implies deepening the company's understanding of local and cultural differences in order to become truly global.

The field of global strategy has advanced to the stage where textbooks have been published to encompass the whole field. However, some of the foundational ideas remain an essential part of the field's intellectual building blocks, particularly the strong firm perspective and emphasis on the firm agency as well as addressing cultural, political, and social differences across borders as the vital contextual factors (Pananond et al. 2020).

### **2.2. Strategic management concept**

Tallman (1991) explains that global strategy has centered on managing the interaction between internal firm capabilities and the external contextual factors from the very outset. The internal focus encompasses studies on ownership advantages, control mechanisms, human resource management, and knowledge management, while the external aspects include entry modes, local adaptation, and legitimacy, among others. Global strategy comprehends this duality of internally building capabilities and firm-specific advantages to deliver excellent value while sourcing externally from the most productive locations, and selling to customers in the most rewarding markets, wherever they might be.

The strategic management process is the complete set of commitments, decisions, and actions required for a firm to achieve strategic competitiveness and earn above-average returns. The process involves analysis, strategy, and performance. The firm's first step is to analyze its external environment and internal organization to determine its resources, capabilities, and core competencies. The strategy portion of the model entails strategy formulation and strategy implementation. With the information gained from external and internal analyses, the firm develops its vision and mission and formulates one or more strategies. To implement its strategies, the firm takes actions to enact each strategy to achieve strategic competitiveness and above-average returns (Hitt et al. 2016). The strategic management concept is generally has divided into two models, namely the Industrial/organization (I / O) model, by looking at the external environment, and the resource-based model that looks at the internal environment. The following is an explanation of each model:

#### **2.2.1. The Industrial Organization (I/O)**

The industrial organization (I/O) model of above-average returns explains the external environment's dominant influence on a firm's strategic actions. The model specifies that the industry or segment of an industry in which a company chooses to compete has a more substantial influence on performance than the choices managers make inside their organizations. The firm's performance is believed to be determined primarily by a range of industrial properties, including economies of scale, barriers to market entry, diversification, product differentiation, the degree of concentration of firms in the industry, and market frictions. The I/O model challenges firms to find the most attractive industry in which to compete. The I/O model suggests that above-average returns are earned when firms can effectively study the external environment as the foundation for identifying an attractive industry and implementing the appropriate strategy (Hitt et al. 2016).

Companies must analyze the general environment in the form of demographic, political, economic, socio-cultural, technological, and global focus on the company's future. Then the company analyzes the industrial

environment, which focuses on factors and conditions that affect the company's profitability in an industry. Finally, the company analyzes the competitor's environment, which focuses on predicting the dynamics of competitors' actions, responses, and intentions. By studying the external environment, companies can identify what they will choose to do. In addition, companies can find out the opportunities and threats from competitors by analyzing the external environment (Hitt et al. 2016).

### 2.2.2. The Resource-Based Model

The resource-based model of above-average returns assumes that each organization is a collection of unique resources and capabilities. The uniqueness of its resources and capabilities is the basis of a firm's strategy and its ability to earn above-average returns. According to the resource-based model, differences in firms' performances across time are due primarily to their unique resources and capabilities rather than the industry's structural characteristics. This model also assumes that firms acquire different resources and develop unique capabilities based on how they combine and use the resources, that resources and certainly capabilities are not highly mobile across firms, and that the differences in resources and capabilities are the basis of competitive advantage. The strategy the firm chooses should allow it to use its competitive advantages in an attractive industry (Hitt et al. 2016).

The final result of the internal factor analysis is that the company knows the company's unique resources, capabilities, and competencies. By studying the internal environment, companies must identify what they can (and should) do. Steps that can be taken care to look at the company's resources and see the company's capabilities then analyzed to find the company's core competencies. With this competence, the company will have a competitive advantage over competitors, which can then be developed competitive strategies (Hitt et al. 2016).

### 3. Methods

This study uses a comparative study of lesson learning from two companies in commercializing Wi-Fi router technology, with TP-Link and Tenda as the case study. This study uses the concept of the Resources-Based Model of Above-Average Returns in strategic management as a framework for analyzing the formulation of global business strategies. Seven stages are used to analyze the two companies that can be seen in Figure 1 below.

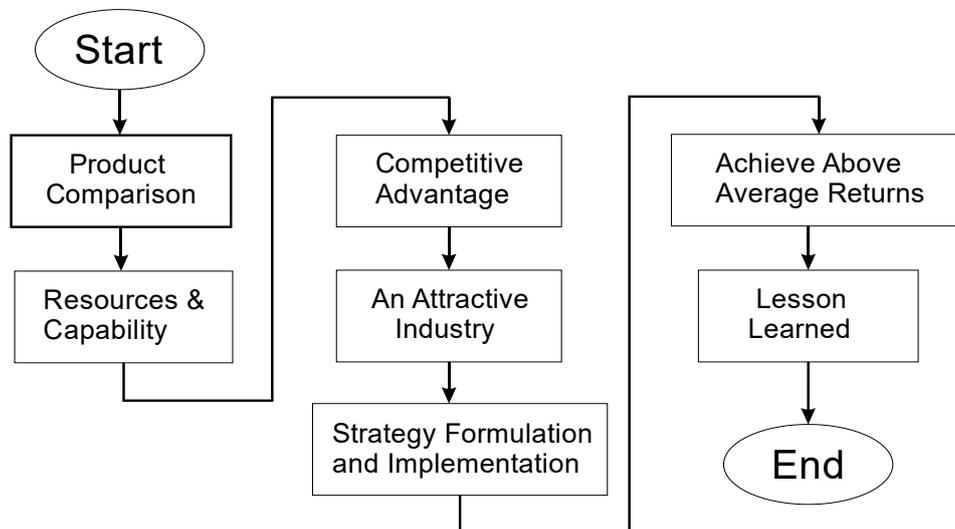


Figure 1. Comparative study framework

Hitt et al. (2016) explain that resources, capabilities, and core competencies provide the foundation of competitive advantage. Resources are the source of a firm's capabilities. Resources are bundled to create organizational capabilities. In turn, capabilities are the source of a firm's core competencies, which are the basis of competitive advantages. Resources are a company asset, including people, brand value/brand. Capabilities are a collection, and a series of resources will shape the company's capabilities. Reflects the ability to use resources in an integrated manner to achieve specific goals. Interaction between tangible and intangible resources. Development through the process of exchanging information and human capital knowledge. The capability source is unique skills and knowledge from company employees and employee functional expertise. Capabilities are often developed in certain useful or certain parts of an organization. Resources and capabilities are sources

of a company's competitive advantage that differentiate a company's competitive level and reflect its personality.

Data collection was done using Google's search engine by typing the keywords "TP-Link Router" and "Tenda Router". Based on each search result, more than 45 million results related to TP-Link and more than 10 million results related to Tenda were identified. Based on the search results, we chose the relevant literature to be used as a discussion in this case study.

## 4. Result and Analysis

### 4.1. Product Comparison

Figure 2 show the picture product TP-Link Archer A6 and Tenda AC10U. Table 2 explains the of Comparison TP-Link routers and Tenda routers in Indonesia. Table 3 explains the comparison of one of the products, TP-Link wireless router and Tenda wireless router, which has almost similar specifications.

Table 2. Comparison TP-Link and Tenda in Indonesia (Selera 2018)

Aspect	TP-Link	Tenda
Signal quality	Tend to be stable	Strong signal
Market share	Reach a wider market	It tends to be easy to find in online markets
Product	Providing network products and accessories	More focus on providing network products only

Table 3. Specification TP-Link Archer A6 and Tenda AC10U (Herwinlab 2020)

Parameter	TP-Link Archer A6	Tenda AC10U
Standard & Protocol	IEEE 802.11ac/n/a 5 GHz	IEEE 802.11ac/n/a 5GHz
	IEEE 802.11n/b/g 2.4 GHz	IEEE 802.11n/g/b 2.4GHz
Wi-Fi Speeds	5 GHz: 867 Mbps (802.11ac)	5GHz: Up to 867Mbps
	2.4 GHz: 300 Mbps (802.11n)	2.4GHz: Up to 300Mbps
Antenna	4× Fixed High-Performance Antennas	4*5dBi External Dual-Band Antennas
	Beamforming	Beamforming
Wi-Fi Capacity	Dual-Band	Dual-Band
	MU-MIMO	MU-MIMO
	802.11ac Wave 2	802.11ac Wave 2
Working Mode	Router Mode/Access Point Mode	Router/AP/Universal Repeater/WISP
Ethernet Ports	1× Gigabit WAN Port	1x <i>USB 2.0</i>
	4× Gigabit LAN Ports	3x GE LAN Ports
		1x GE WAN Port
Tombol	WPS/Wi-Fi Button	1* Wi-Fi On/Off button
	Power On/Off Button	1*Reset/WPS button
	Reset Button	
Listrik	12 V = 1 A	Power Input: 100-240V—50/60Hz
		Power Output: DC 12V==2A
Dimensi	230 × 144 × 35 mm	220 x 141.5 x 49 mm
Garansi	1 tahun	2 tahun
Processor	750MHz SoC / 775MHz	1GHz
RAM	128MB	128MB DDR3
Harga	Rp. 490.000	Rp. 465.000



Figure 2. TP-Link Archer A6 and Tenda AC10U (Herwinlab 2020)

The advantage of TP-Link compared to Tenda is that TP-Link has a larger market share, so that the products are easy to find and the product range is more comprehensive. Therefore, the prospective buyers of TP-Link easily find TP-Link products anywhere. Another plus is that the TP-link provides many accessories. TP-Link company not only provides Wi-Fi routers, but there are also other products such as many complete accessories for cellphones, lights, Bluetooth, power banks, cloud cameras, and cellphone accessories. In comparison, Tenda is more focused on providing network products only, such as Wi-Fi routers, mesh, power cables, adapters, extenders, and IP cameras. The disadvantage of TP-Link compared to Tenda is that the price tends to be more expensive than Tenda. (Selera 2018).

#### 4.2. Resources and Capability

Resources are the source of the company's capabilities. Then, capabilities are collections and a series of resources that will shape the company's capabilities. Table 4 is a comparison of the resources and capabilities of TP-Link and Tenda Router:

Table 4. Resources and Capability of TP-Link and Tenda

Aspect	TP-Link	Tenda
Resources	<ul style="list-style-type: none"> <li>• Factory Location: Shenzhen, China</li> <li>• Area: 71000 M<sup>2</sup></li> <li>• Production Employees: 6000</li> <li>• 1 SMT lines with 193 automatic SMT machines</li> <li>• Annual production capacity: 66 million units (Yulius 2014)</li> </ul>	<ul style="list-style-type: none"> <li>• Tenda has two R&amp;D centers, Shenzhen and Chengdu, with about 1000 employees</li> <li>• One Manufacture center, with about 3000 members</li> <li>• A new 120000 m<sup>2</sup> manufacture base under construction (Tenda 2021)</li> </ul>
Capabilities	<ul style="list-style-type: none"> <li>• Maintain customer trust by ensuring product quality is maintained during production, packaging, shipping. Carrying out legal procedures and trials set by the destination country (sindonews 2020)</li> <li>• Reliably Smart With a proven heritage of stability, performance and value, we have provided the latest networking technologies for homes to enjoy smart living and provide tools and solutions to keep businesses connected and productive. TP-Link wants to create a simple, smart, and connected lifestyle for everyone. TP-Link aspires to provide reliability in everything we do. We dream, and we will do it. (TP-Link 2021)</li> </ul>	<ul style="list-style-type: none"> <li>• Tenda Channel program includes training, certification, and marketing support on a complete range of Tenda products. Tenda Partner Training workshop helped resellers to up-skill in Tenda's product range and open up new revenue streams. It is allowing them to sell a much more comprehensive product portfolio (Tenda 2019)\</li> <li>• Mission &amp; Vision: Speed, secure, and intelligent network solutions, anywhere and anytime.</li> <li>• Core Values: Succeed - Help Customers Win Execution - Effort &amp; Push Teamwork - Honesty &amp; Achievement Service: Best, Brilliant &amp; Professional Spirit: Motivated, Innovative &amp; Faith (Tenda 2019)</li> </ul>

#### 4.3. Competitive Advantage

TP-Link's Competitive Advantage is committed to improving performance, innovating with new products, and prioritizing services for customers so that TP-Link will continue to be the best. The company will prepare a series of well-planned strategies to face stiff competition. The company will also release several cutting-edge products that are full of innovation and provide many benefits to society. TP-Link plan this year is to introduce our innovative products that are created to make people's lives easier. In the midst of advances in information technology, people want sophisticated products that provide comfort in life. Today we will pay attention to online sales by increasing brand visibility and product availability in modern markets. Online sales are essential considering that this type of business has become a trend in 2017 and has a significant growth rate that cannot be separated from economic developments and intense competition (Wilson 2018).

The Competitive Advantage of Tenda is that Tenda offers products in more than 100 countries. Tenda offers powerful products, steady signal, easy development. Tenda in the destination market always cooperates with local companies to market their products. Tenda, in general, selling products at a lower price than competitors and in destination markets always cooperate with local companies to market their products.

#### **4.4. An Attractive Industry**

Worldwide revenue for the combined consumer and enterprise wireless local area network (WLAN) market segments increased 17.9% year over year in the fourth quarter of 2020 (4Q20) and grew 10.3% for the entire year (IDC 2020)

The router industry is attractive because getting into this industry is not easy because the technology used in this industry is continuously developing every year. Then suppliers and buyers have a weak position because of the technology that develops in this industry. The high technology makes the supplier of raw materials in this industry vulnerable, depending on the demand for the technology needed by companies and buyers. The industry must also understand this technology in advance and adapt it to the needs of business buyers. Hence, the position of buyers is also weak.

#### **4.5. Strategy Formulation and Implementation**

From the data above regarding resources, capabilities, competitive advantage, and attractive industry, it can be concluded that the strategies used by router companies to penetrate the global market are:

1. Bringing out new innovations by releasing router products with new technology every year
2. Divide the product into several different market segments, namely for personal needs or business needs.
3. TP-Link sells its own products while Tenda works closely with local companies in the destination countries.
4. Building communication with consumers by making products according to consumer needs makes it easier for consumers to find information by having a website in a language tailored for each market destination country and a forum to discuss how to use router products and problems that arise.
5. Ensure product quality is maintained during production, packaging, and delivery, provide product guarantees and provide service centers in market destination countries.

#### **4.6. Achieve Above Average Returns**

TP-Link's above-average return is that TP-Link is one of the largest providers of consumer Wi-Fi network devices in the world. TP-Link delivers products to more than 170 countries and hundreds of millions of subscribers.

Tenda's above-average return is through worldwide distribution channels. Tenda distributes products to more than 100 countries around the world. Until the third quarter of 2014, the number of sales of Tenda is more than 500 million.

#### **4.7. Lesson Learned**

To achieve an above-average return, TP-Link sells its own products by prioritizing brand visibility and product availability in the market. In addition, TP-Link maintains customer trust by ensuring product quality is maintained during production, packaging, and delivery. In comparison, Tenda collaborates with local companies to market products in their destination countries. Tenda also holds training for resellers so that resellers can improve their skills and knowledge about Tenda products to sell a much more comprehensive portfolio of Tenda products.

Lessons that can be learned from the comparison of the two router manufacturing companies, TP-Link and Tenda, can be seen from the strategy and implementation implemented by the company, namely about

innovation, product marketing, communication with consumers, and quality. Router manufacturers must continue to innovate so that they are not less competitive with their competitors. Product marketing is tailored to the company's strategy and market conditions in the destination country. Communication with consumers is vital so that products are known, needed, and purchased by consumers. Meanwhile, quality builds is a brand image in the eyes of consumers so that consumers recommend router products to friends or family. This can be used as a lesson for Indonesian companies that want to start a router production business in Indonesia.

## 5. Conclusions

A comparative analysis of two Wi-Fi router companies has been carried out. This analysis is carried out by looking at the various circumstances of the two companies and taking a management strategy approach. The results of this study can be used as a basis for developing global business strategies for companies to get better developments and as lessons for companies in Indonesia who want to do Wi-Fi router business. Comparison of companies carried out includes two companies engaged in the same business line, which results in two databases that can complement each other's shortcomings. This information is obtained from their respective websites and from various sources that can later be adopted by the company. From the results of the analysis that has been carried out, the commercialization of technology has been successfully carried out for several reasons, namely the company's resources, capabilities, and competitive advantages, as well as the formulation and implementation of the company's strategy.

The limitation in this study is that the data used in this study are only based on literature, so that it is not too detailed. In addition, there are difficulties in analyzing the actual internal conditions of the company, so that internal analysis can only be carried out based on the existing literature. Future research is expected to be more specific in analyzing the company's internal environment, including its resources and capabilities.

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