

# IT Value Analysis by Resource-Based View Theory: The Case Study of PT. Telekomunikasi Indonesia, Tbk.

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## Abstract

It's believed that IT spending has influenced business performance. This departs from a theory, which stated that resources owned by business organizations have close relationship to levels of the business competitive advantage as Resource-Based View (RBV) theory proposes. To confirm this theory, a case study is performed for PT. Telekomunikasi Indonesia, Tbk., the largest telcos industry in Indonesia. Researched data refer to Telkom Annual Report published between 2005 and 2012. The study focuses on data reflecting the relationship between IT spending and business performance. Findings show that IT spending has had a positive correlation to Telkom IT revenue. Likewise, metric-based performances such as ROA, ROE, Tobin's  $q$ , and MVA have shown positive values, which strengthen the hypothesis above that the managed resources are in line with firm's profitability, effectiveness, and total-amount value created. Telkom IT resources referring to RBV are then analyzed in terms of IT capability, IT competence, and competitive advantage that lead to be the IT value model. To sum up, the case study result indicates that IT value has definitely affected Telkom business performance. However, it is necessary to enlarge the case study to the other similar industry or the different one.

**Keywords:** *Telkom; resource-based view; IT value; business performance; IT resource; capability; competence; competitive advantage.*

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## Introduction and Background

The case study will highlight PT. Telekomunikasi Indonesia, Tbk (Telkom) as the largest telecommunication company in Indonesia. Since 1995, Telkom has gone public; however, up until now 53.90 % of its stocks belongs to the Government of Indonesia and 46.10 % belongs to public, therefore its status still as a state-owned enterprise. Besides that, the Government owns Series A Dwiwarna share that gives it special voting and veto rights<sup>[4]</sup>. For that reason, the Government has an interest in Telkom performance, both in terms of the service its management provides to the nation and management ability to operate on a commercial basis.

Telkom common stock is listed and traded on the Indonesia's Stock Market (IDX). In addition, Telkom shares are listed and traded on the New York Stock Exchange (NYSE) and the London Stock Exchange (LSE) as ADSs (American Depositary Shares),

where one ADS represents 40 shares of common stock. Telkom shares are also Publicly Offered Without Listing (POWL) in Japan <sup>[4]</sup>.

Telkom business, in short, consists of two business activities: main and support businesses. Main business is to plan, build, deliver, develop, operate, sell, and maintain telecommunications and information networks in the broadest sense with respect to provisions of laws and regulations. Additionally, the main business also is to plan, develop, deliver, sell and improve telecommunications and information services in the broadest sense with respect to provisions of laws and regulations <sup>[4]</sup>.

On the other hand, supporting business is to provide payment transaction and remittance services via telecommunications and information networks. Also, it is to carry out activities and other undertakings in respect of optimizing the firm's resources, among others the utilization of the firm's property and equipment and movable assets, information system facilities, education and training facilities and maintenance and repair. In doing so, Telkom has worked by itself as a parent company or through its subsidiaries. The largest Telkom's subsidiary is Telkomsel serving cellular business <sup>[4]</sup>.

Furthermore, this paper will provide us with a case study conducted in Telkom in terms of the role Information Technology (IT) with regard to business performance. In general, we have already understood that IT possesses strategic function in business by means of cost reduction, business process effectiveness, time saving, etc. However, we have to also understand about how to relate IT to business performance using Resource-Based View theory approach. So far there has been no similar study conducted at Telkom, either to test the theory or to measure Telkom business performance related IT. This study tries to trace IT relationship to Telkom performance. As a result, it can be concluded that there is close relationship between IT resources role and Telkom business performance.

The remainder of this paper will be systematized as follows. In section "The Case Study of Telkom's IT Value", we work with the case study for Telkom to validate the RBV-based conceptual model, how far this model has contribution to the best practice. Section "Case Study Analysis of the Context of RBV" gives explanation IT values at Telkom based on the RBV model; in here, the RBV model is the basis for the explanation related to the results of the case study. Moreover, section "Research Methodology" explicates the methodology used in the case study hence it results in tables. Section "Discussion" reviews comparison between the case study and the proposed model including recommendations for Telkom and limitations on the study. Finally, section "Conclusion" reviews the substance of the case study and improvement for the future research.

### **The Case Study of Telkom's IT Value**

To analyze the relationship between Information Technology (IT) spending and business performance at Telkom will refer to Telkom Annual Reports (TAR) that publish regularly every year. The annual report, which this paper is based on, has been

published for 8 years back, i.e. from 2005 to 2012. All reports can be downloaded from public Telkom's site, i.e. www.telkom.co.id.

*IT Investment on IT Revenue*

Accordingly, to be familiar with IT value firstly it can be summarized IT spending compared with total spending as seen in table 1.

	CAPEX per year (Rp billion)								
	2004	2005	2006	2007	2008	2009	2010	2011	2012
<b>IT CAPEX</b>	3,716	3,368	2,204	3,508	6,087	5,652	3,623	4,202	4,040
<b>TOTAL CAPEX</b>	8,820	13,553	17,239	15,780	22,245	19,161	12,651	14,603	17,272
<b>% IT CAPEX</b>	42%	25%	13%	22%	27%	29%	29%	29%	23%
<b>% IT Cap Growth</b>	-	-9%	-35%	59%	74%	-7%	-36%	16%	-4%

**Table 1.** Telkom's IT Capital Expenditure (Adopted from TAR, 2005-2012)

It is necessary to note, that the conception of IT capex is referring to capital expenditures that has been spent for broadband services, network infrastructure, legacy optimization, and capex support <sup>[4]</sup>.

On the practice, this IT spending is what Telkom has spent as the parent company, while what subsidiaries has spent is not explained particularly on the report. That is, there are some assumptions referred to the Telkom's annual reports in terms of IT spending as follows:

- Principally telco's industries, including Telkom, are IT-based firm organizations; therefore, Telkom spending is IT spending as well. However, in order to strengthen IT value research on this paper, it is differed between IT and Telkom overall spending.
- Subsidiaries spending are assumed as non-IT spending in this context, although parts of them have done business on telco's industry such as Telkomsel. However, there is no detail on the report regarding this spending so it is hard to explore kinds of the spending.
- To analyze Telkom's business performance, it involves whether Telkom is as a consolidated enterprise or a parent one.

According to table 1, scale of IT spending is various; however, in average IT spending compared with total spending is 27 % per year. Similarly, although there are negative growths of IT spending; however, in average it is a positive increasing of spending being equal to 7 % per year. This means that Telkom IT spending always grows from year to year.

To view an effect of IT spending, it is plausible if the spending is compared with its productivity<sup>1</sup> approximately represented by its operating revenue. Additionally, business value of IT investments is derived by increasing revenues of existing products and by creating new products, which lead to revenue flows <sup>[2]</sup>. Accordingly, referring to TAR, the revenues can be summarized in table 2 as follows:

1 An economic measure of output per unit of input. Inputs include labor and capital, while output is typically measured in revenues and other GDP components such as business inventories [17].

	Operating Revenue per year (Rp billion)								
	2004	2005	2006	2007	2008	2009	2010	2011	2012
IT Revenue	22,296	26,044	29,445	38,812	36,919	37,883	37,534	40,353	43,767
Total Revenue	33,948	41,807	51,294	62,683	64,166	67,678	68,629	71,253	77,143
% IT Revenue	66%	62%	57%	62%	58%	56%	55%	57%	57%
% IT Rev Growth	-	17%	13%	32%	-5%	3%	-1%	8%	8%

**Table 2.** Telkom's IT Revenue (Adopted from TAR, 2005-2012)

As explained above, to summarize the IT revenues there also is an estimate approach. Here IT revenue contains data, internet, information technology services, interconnection services, network services, and fixed line services revenues <sup>[4]</sup>. This estimate is based on the previous IT spending above, meaning that IT spending and IT revenue have a close correlation in between. IT spending consisting of broadband services, network infrastructure, legacy optimization, and capex support is an engine to generate this revenue.

According to table 2, IT revenue always increases every year except in 2008 and 2010. This is caused by fixed line service revenues, which tend to decrease from year to year <sup>[4]</sup>. However, by improvement of other IT-based services, the whole revenue is going back to increase. In average IT revenue compared with total revenue is 59 % per year. Similarly, although there is negative growths of IT revenue; however, in average it has been a positive increment of the revenue being equal to 9 % per year. This means that Telkom IT revenue always increase from year to year pertaining to its business growth as well.

#### IT Investment on Business

In order to get more precisely result, Brynjolfsson and Hitt (1998) suggest that the value of IT should be determined by intangible measurements such as enhancements in quality, customer service, and new product development. In addition, to measure IT value creation there is three categories for measuring <sup>[33]</sup>:

1. *Profitability*: It can be measured by return on investment (ROI), return on equity (ROE), and return on assets (ROA).
2. *Effectiveness*: To measure it commonly used effectiveness measures are Tobin's Q and market-to-book value.
3. *Total-amount value created*: Examples are economic value added (EVA) and market value added (MVA).

Business Performance	Year								
	2004	2005	2006	2007	2008	2009	2010	2011	2012
ROE (%)	36.5	34.3	39.2	38.1	31.5	29.6	26	23.1	24.9
ROA (%)	11.8	12.9	14.6	15.7	11.7	11.6	11.5	10.6	11.5
Tobin's Q	1.65	1.91	2.71	2.49	1.49	1.90	1.56	1.33	1.56
MVA (Rp billion)	83,60	105,40	186,36	188,84	113,47	166,72	143,72	122,07	156,03

**Table 3.** IT and Business Performance (Adopted from TAR, 2005-2012)

Note:

- ROE is calculated as profit for the year attributable to owners of the parent company divided by total equity attributable to owners of the parent company at year ending December 31 [4].
- ROA is calculated as profit for the year attributable to owners of the parent company divided by total assets at year ending December 31 [4].
- The Q ratio is calculated as the market value of a company divided by the replacement value of the firm's assets or  $Q \text{ ratio} = \text{Total Market Value of Firm} / \text{Total Asset Value}$  [14].
- A calculation that shows the difference between the market value of a company and the capital contributed by investors (both bondholders and shareholders) or  $MVA = \text{Company's Market Value} - \text{Invested Capital}$  [15].

In table 3, there is part of metric business performances representing metrics proposed above; i.e. ROE and ROA represent profitability, Tobin's Q represents effectiveness, and MVA represents total-amount value created. The metrics are calculated derived from Telkom and its subsidiaries. This is caused by that Telkom is an IT-based enterprise, so Telkom's resources are identical to IT resources as well. Therefore, to view the business performance is suitably based on Telkom as whole. Additionally, the other reason is that IT spending has served to increase firm productivity and consumer value in one hand. In the other hand, IT spending has also lowered entry barriers, eliminated market inefficiencies, which enable a firm to maintain market leadership, and intensified market competition [18].

### Case Study Analysis of the Context of RBV

Resource-Based View (RBV) theory is a tool to find out the IT impact on business performance. RBV is the major theory that has been adopted to understand the relationship between IT and firm performance proposed by Wernerfelt (1984). The fundamental reason of RBV is that firm performance is determined by the resources it owns. The firm with more valuable scarce resources is more likely to generate sustainable competitive advantages. Based on this view, IT is considered as a valuable organizational resource that can enhance organizational capabilities and eventually lead to higher performance. In a recent study, in strategic management, Liang *at al.* (2010) stated that Crook *et al.* (2008) argued that RBV "has emerged as a key perspective guiding inquiry into the determinants of organizational performance" [33].

Powell (2007) describes that the RBV conceptualizes the firm as a bundle of resources. It is these resources, and the way that they are combined, that make firms different from one another and in turn allow a firm to deliver products and services in the market [36]. In addition, the RBV argues that is to achieve competitive advantage, a firm has to possess valuable and rare resources. Furthermore, the RBV will distinguish between information technology (IT) and information systems (IS). IT is asset-based, while IS is a combination of assets and capabilities resulted from a productive use of IT

[24]. Accordingly, it is reasonable to analyze Telkom performance from IT value point of view based on Resource-Based View theory.

### *IT Resources*

Telkom's resources assumed as IT resources are identical to broadband services, network infrastructure, legacy optimization, and capex support [4]. Previously in TAR 2011, 2010, etc., resources were grouped into optimizing legacy, new wave, infrastructure, and support, which are not too different with 2012. Here optimizing legacy involves fixed wire line and wireless optimization. New wave is broadband, soft switch, data communication, IT, and others. Infrastructure consists of backbone transmission network, satellite, and others. While support is research and development activities, maintenance activities, learning and supply activities, buildings (for operations and equipment), and power supply. The support also contains network measurement tools, office facilities standby/ contingency budget to support the dynamic high-end market and wholesale customers, and fixed wireless network and wireless broadband access [7].

According to Bharadwaj (2000) IT resources contains three categories: (1) IT infrastructure as tangible resources, (2) human IT resources representing technical and managerial IT skill, and (3) intangible IT-enabled resources such as knowledge assets, customer orientation, and synergy [3]. IT Telkom resources following Bharadwaj theory can be approximately described as follows:

#### 1. Tangible Resources

These resources address IT infrastructure. Here, strengthening fixed wire line and wireless, broadband, soft switch, data communication, other IT infrastructures, and power supply are IT infrastructures. Byrd (2008) mentioned that the IT infrastructures are "the shared IT resource consisting of a technical physical base of hardware, software, communication technologies, data, and core software applications, and a human component of skills, expertise, and knowledge that combine to create IT services that are typically unique, or at least distinctive, to an organization" [20].

According to RBV theory as stated by Barney (1991) that advantageous resources have to have 4 attributes; i.e. valuable, rare, imperfectly inimitable, and non-substitutable [33]. That is, in order to own these attributes Telkom IT infrastructures should also leverage each other and provide a superior foundation so it will be difficult to duplicate or imitate. In other words, although an individual asset of IT infrastructures may be easily duplicated; there is fact that when various IT assets and its capabilities are integrated appropriately, it will form an entity resulting in unique characteristics [20, p.164].

#### 2. IT Human Resources

According to Telkom IT capex, there is a capex support item. This item is consisting of research and development activities, maintenance activities, learning and supply activities, buildings (for operations and equipment) [7]. In addition, this item has close relationship to human building. Meaning that human IT resources at Telkom have been paid attention well. These resources, in turn, are those who have to control the IT infrastructures in order to have power over the infrastructures. In accordance

with Datta (2007), these managerial skills, which are obtained through long period and are tacit by nature, can become a source of sustained competitive advantage <sup>[24]</sup>. As a result, the valuable IT resources should be combined with the unique IT human resources to realize the most value. Therefore, this also imply that these IT managers should not just by design outsource for human IT skills and services because synergy between the technical resources and human resources are more possible to occur if the human IT expertise are inside the firm <sup>[20, p.179]</sup>.

### 3. Intangible IT-enabled Resources

These resources relate to improved customer service, enhanced product quality, increased market responsiveness, and better coordination of buyers and suppliers in evaluating IT systems. In short, IT's enabling role consists of three key organizational intangibles: customer orientation, knowledge assets, and synergy <sup>[3]</sup>.

In Telkom context, these resources have already been confirmed as follows, "Investing in information technology ("IT") services is a strategic initiative to enter the IT industry and enhance our ability to provide solutions and improve the performance of other industry segments. This strategic initiative also aims at reducing the capability gap as a provider of information and communication technology solutions to the consumer, enterprise and SME customers" <sup>[4, p. 44]</sup>. Additionally in audited "Consolidated financial statements" 2012 there is a statement, "Based on closing agreement dated November 30, 2012, the identifiable assets arising from the acquisition comprised of land, buildings, machine and equipment with total fair value amounting to Rp 150 billion and intangible assets included customer contracts and backlog with fair value amounting to Rp 3 billion. The acquisition result in goodwill amounting to Rp 77 billion" <sup>[4, p. 15]</sup>.

Although both statements are not promptly relating to IT resources, we can consider that they have link to IT resources, either directly or indirectly. Banker and Kauffman (1991) stated that the principal resources that management aims for operating cost decreases comprise labor, materials, capital, energy and IT. However, among this group of inputs IT is special because it gives management force to reduce other costs through substitution. For instance, financial services IT investments encourage reductions in labor and capital in one hand. In the other hand, manufacturing IT investments can cut waste in materials and energy, while getting better inventory management, quality and overall firm performance <sup>[2]</sup>.

#### IT Capabilities

The definition of IT capability is "the ability to mobilize and deploy IT-based resources in combination or co-present with other resources and capabilities" <sup>[3, p. 171]</sup>. Meanwhile IT capabilities are classified as follows <sup>[43, p.19]</sup>:

- IT infrastructure capability. It relates to the ability to share information across various functions, innovate, and develop business opportunities, and the elasticity to react to changes in business strategy. As a result, IT infrastructure capabilities are the ability of the IT division to supply extensive firm-wide IT infrastructure services

that serve the organization's business processes as the base foundation of other IT capabilities.

- Managerial IT skills. IT human capitals dedicate in technical and managerial IT skills. Managerial IT skills are often tacit by nature, dependent on other interpersonal relationships, which might take years to build up so they have a high inimitable, difficult to duplicate and substitute. In other words, it shows the ability of the IT division to formulate, develop, and make use of IT solutions to support and improve organizational business processes.
- Collaboration between IT and business, being composed of sharing risk and responsibility for IT application each other. This indicates the ability of the IT division to generate collaboration with business groups to work collectively to exploit new business prospects. In addition, both IT infrastructure capabilities and managerial IT skills will support the formation and consolidation of the collaborations between IT and business.

It appears that between IT resources and IT capability has a reciprocal relationship. IT resources consist of infrastructures, human resources, and intangible resources. The productive use of those IT resources will result in IT capability. Accordingly in light of this issue, Ravichandran and Lertwongsatien (2005) argued that between firm's IT resources and IS capabilities own constructive relationships [3, p. 171].

At Telkom, productivity of IT resources are described by the case study above which IT spending has had directly proportional to revenue, meaning that there is an increase in both the magnitude in line with the passage of time. Likewise, the other metrics have indicated convinced performances. Meaning that Telkom IT capability has been embodied in productivity of strengthening fixed wire line and wireless, broadband, soft switch, data communication, other IT infrastructures, and power supply are IT infrastructures.

#### *IT Core Competences*

IS infrastructure flexibility is studied in its relationships as an enabler of core competencies that have been closely linked to sustained competitive advantage in the management literature. The core competencies are mass customization and time-to-market [21]. Here in the context of IT, the concept of competency consisting of three components: IT knowledge, IT operations, and IT objects; and provide an operable measure for this construct. IT knowledge is the extent to which a firm possesses a body of technical knowledge about objects such as computer-based systems. While IT operations are the extent to which a firm utilizes IT to manage market and customer information. IT objects represents computer-based hardware, software, and support personnel [39].

Tippins and Sohi (2003) argue that business competences mediate the relationship between IT competence and business competences when understanding how IT influence business performance [14]. On the other side, Simerly (2002) affirmed, "[t]he core competence of any organization is the knowledge of its people." [27].

Telkom case study has not yet indicated this competence explicitly; however if



referring to Tippins & Sohi (2003) that in the context of IT, the concept of competency consisting of three components: IT knowledge, IT operations, and IT objects, some metrics in TAR have already shown them.

#### *Sustainable Competitive Advantage*

The definition of firm competitive advantage is to create more economic value than a marginal competitor (Peteraf and Barney, 2003) that achieves only break-even. A firm has competitive advantage if it systematically achieves net profits <sup>[23]</sup>.

Byrd, T.A (2001) mentioned that IS infrastructure flexibility has a relationship to sustained competitive advantage by acting as an enabler of both mass customization and speed-to-market. He defined the flexibility as the level in which a firm owns various real and potential methods, and the quickness by which it can execute these methods to enhance the control capability of the management and increase the controllability of the firm in excess of its environment. The IS infrastructure flexibility is more precisely described by the quality of connectivity, compatibility, and modularity. Connectivity refers to the ability of any of technology part to join any other parts inside and outside the firm environment. Compatibility is the ability to share kind of information across any technology parts. While modularity is the ability to put in, adjust, and take away any software or hardware parts of the infrastructure easily and no foremost overall effect <sup>[21]</sup>.

Furthermore, Byrd (2001) stated that mass customization relates to develop a product or produce a service on behalf of responding particular customer's needs in a cost effective way certainly. In other words, it is a customer-centered orientation in production and delivery processes in order for the firm to collaborate with individual customers. While speed-to-market, have two categories: time-to-market and delivery performance. Time-to-market relates to the elapsed time between product designation and its availability. Delivery performance refers to the ability to deliver a product within a shorter elapsed time than can competitors, measured in delivery lead-time <sup>[21]</sup>.

#### **Research Methodology**

This case study intends to validate the RBV-based model in terms of IT value; i.e. IT resources owned by Telkom have close relationship to its business performance, so they will help to increase the business accomplishment. Accordingly, to do the research, firstly it is to choose Telkom as a study object simply because Telkom is an IT-based industry and relatively easy to search out the data due to the published enterprise. Secondly, it is to collect the data, which refer to TAR published between 2005 and 2012. Thirdly, it is to select TAR's data reflecting the case study purpose, namely to search for relationships among IT spending and business performances such as revenue, return on asset, return on equity, Tobin's q, and market value added. These metrics are part of many metrics representing business performances. It is hard to measure whole metrics regarding the performance caused by their magnitudes have not been available in the TAR.

The next investigation is to relate the case study results to the RBV model in order

to examine Telkom's IT resources and its business performance. This technique enables to elaborate factors inside IT resources into many categories such as IT infrastructure, human IT resources, and IT-enabled intangible. Likewise, starting from IT resources it can trace IT capability regarding the resources and its capability can create unique competence. In turn, the competence leads to business competitive advantage.

## Discussion

This research let us prove that between IT value and business performance has significant correlation, especially for Telkom as an IT-based enterprise. It also supports some researches, which contend the same thing although they had been conducted outside Telkom. Findings regarding this paper consist of things as follows:

### *The Case Study*

Telkom's case study above works on two things: IT investment on IT revenue and IT investment on business. In terms of the first thing, we can view findings as follows. If composition of percentage of both IT capex and IT revenue is confronted, it will be seen as in table 4 below:

	Year of IT Capex to IT Revenue Comparison								
	2004	2005	2006	2007	2008	2009	2010	2011	2012
% IT CAPEX	42%	25%	13%	22%	27%	29%	29%	29%	23%
% IT Revenue	66%	62%	57%	62%	58%	56%	55%	57%	57%

**Table 4.** *IT Capex and IT Revenue Comparison*

The table tells us that the percentage of IT revenue always exceeds IT spending, even though that there is no an exact relationship between scale of percentage of IT spending and IT revenue. For example in 2004, the percentage of IT spending is 42 % correlated to 66 % of IT revenue, while in 2005, 25 % of IT spending associates with 62 % of IT revenue, etc. In average the percentage of IT spending is 27 % "resulting in" 59 % of IT revenue. Commonly the increase of IT revenues is due to contribution of the increase in revenues from data, internet, and information technology services, interconnection and other telecommunications services, partly offset by decreases in revenues from fixed lines telephone and network <sup>[4]</sup>.

It appears that investment of IT absolutely contributes to increase revenues. In other words, IT resources have positive relationships to improve business performance represented by financial performance. Actually, Telkom as a telecommunication and IT-based enterprise, if all capital expenditures assumed as IT expenditures are illustrated here, totally it will result in operating revenues that always exceed the expenditure as well <sup>[4]</sup>. This relates to "the reality is that payoffs from IT investments are not just the responsibility of the IT function. Each constituent who uses IT or is involved in the value generation shares responsibility for aligning IT with business functions" <sup>[31]</sup>.

This phenomenon also indicates, "IT plays an increasingly important role in

almost all aspects of the firm's operations and corporate strategies, and for almost all industries IT is considered a major if not the most important strategic asset" [34]. However, this analysis is a preliminary analysis because it is still conducted on simplified and global variables, i.e. capital expenditures and revenues.

Furthermore, in terms of the second thing, that we can see that previous table 3 above shows four metrics: ROE, ROA, Tobin's q, and MVA. ROE is between 23 % and 40 %. ROE is an important measure of the profitability of a firm. Therefore, higher values are generally favorable meaning that the firm is efficient in generating income on new investment [13].

Similarly, ROA is between 10 % and 16 %, meaning that the number of cents earned on each rupiah of assets is between 10 % and 16 %. That is, higher values of ROA show that business is more profitable. On the other hand, an increasing trend of ROA indicates that the profitability of the firm is improving. Conversely, a decreasing trend means that profitability is deteriorating [12]. For Telkom context, both ROA and ROE trend tend to decrease; however, both are still positive. Therefore, its business performance is still promising because ROA incorporates measures of both firm profitability and efficiency [20].

Moreover, table 3 above shows the Tobin's Q, which all ratios are larger than one. This Tobin's Q ratio indicates that the stock is overvalued because the stock is more expensive than the replacement cost of its assets ( $Q > 1$ ). Conversely, if Q between 0 and 1 means that the cost to replace a firm's assets is greater than the value of its stock. This implies that the stock is undervalued [14]. Additionally, Q ratio accurately captures two kinds of firm performance: first, IT contributes to long-term firm performance, and second IT contributes to firm intangible value [18].

Meanwhile, MVA has been positive for 9 years back as seen in table 3. The higher the MVA, the better. The high MVA indicates the company has created substantial prosperity for the shareholders. Otherwise, the negative MVA means that the value of management's actions and investments are less than the value of the capital contributed to the company by the capital market (or that prosperity and value have been destroyed) [15].

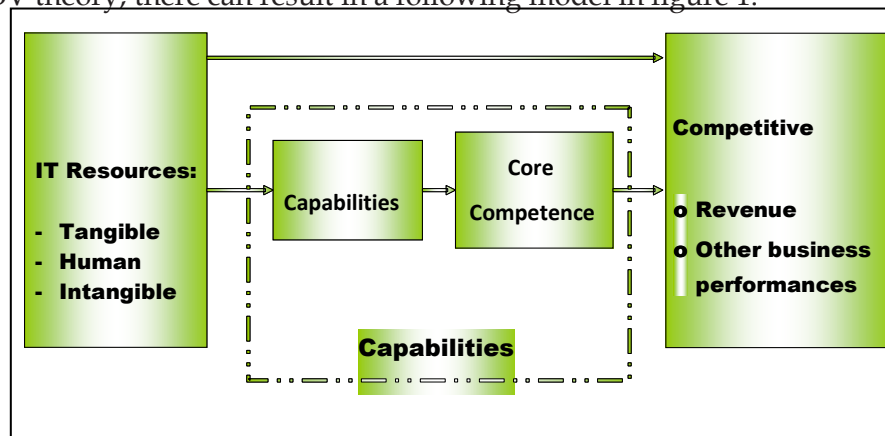
The MVA measures the performance of management in order to reflect the general market. Management has a part in it but not totally. In a bull stock market, the amount contributed by management may even be negative, but the overall market may be driving the MVA into positive territory. This calculation does not take into consideration any cash payments that have been paid out to stockholders in the interim nor does it measure the opportunity costs in relation to alternative investments [16].

According to the three categories [34] above in order to measure IT value creation, it appears here that IT value has been contributing to generate better performance of Telkom. In the other words, Telkom has owned a business value referring to those metrics. The business value relates to the economic contribution that IT can make to management's goal of profit maximization in the firm [2]. In addition, those metrics can represent intangible measurements such as enhancements in quality, customer service, and new product development [34] because they are reflected on profitability, effectiveness, and value created. From RBV point of view, Telkom resources represented by IT investment

have influenced IT revenue and business at once. It means IT that inherently possesses capabilities and emerged competences, if well-managed, in turn, will create better business performance, reflected in sustainable competitive advantage. Furthermore, the study results will embody in an IT value model as will be discussed below.

#### *IT Value Model*

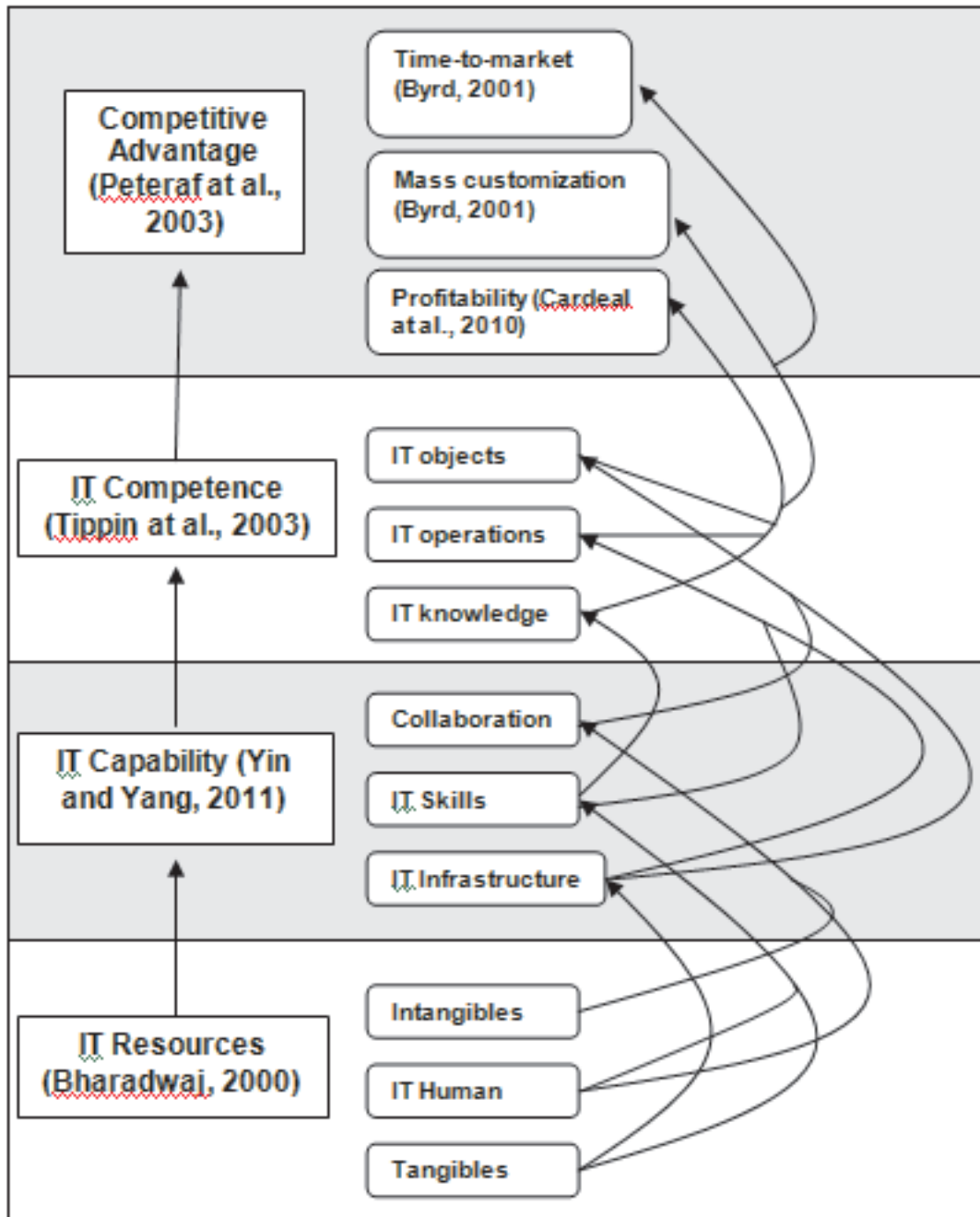
According to the previous researches, the case study, and its description related to the RBV theory, there can result in a following model in figure 1:



**Figure 1.** *IT Value Model*

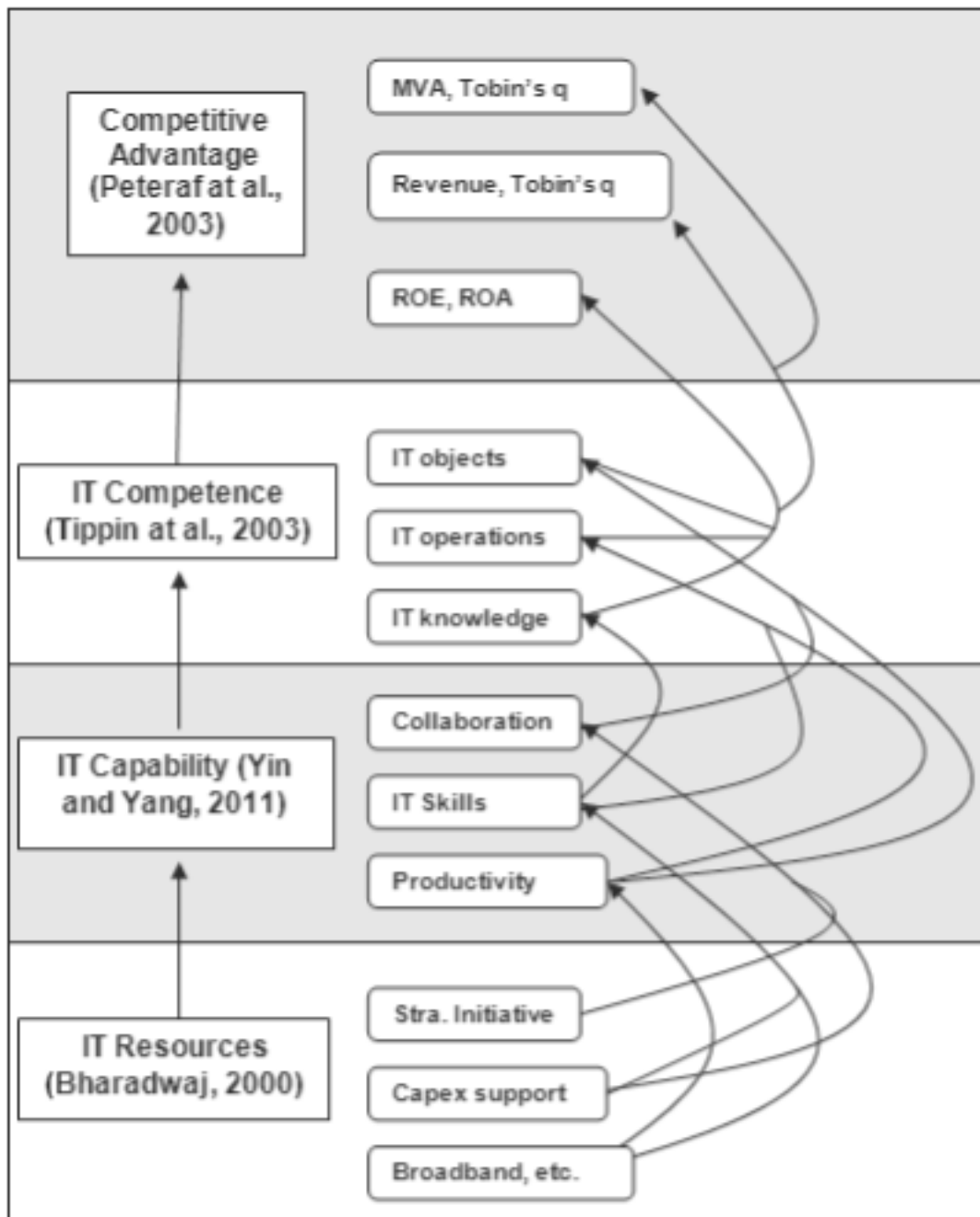
The figure 1 shows that there are two possibilities to view relationship between IT resource and business performance. The first IT resource directly links to business performance as researchers studied early. The second, between IT resources and business performance have bridges, which can be explored as far as possible to obtain explicit relationship. The bridges are IT capability and IT competence. Between IT resources and capability have been many researches addressing that recently; however, those who address IT competence are still minor. This paper tries to provide us with the second approach to study the relationship between IT value and business performance analyzed from IT resources through IT capability, IT competence, and then competitive advantage.

Accordingly, to obtain a clearer model, the figure 1 should be broken down to become the four components equipped by their metrics. The metrics are obtained by meta-analysis approach referred to some researched references. In addition, to do so is based on qualitative judgment in order to develop cause-and-effect relationship among component metrics, so it will be in figure 2.



**Figure 2.** IT Value Model with Causal Relationship

In Telkom context, the figure 2 will become as figure 3 below by substituting the metrics with Telkom case study metrics approximately.



**Figure 3.** Telkom IT Value Model

#### Recommendation

This paper recommends Telkom as an IT-based enterprises to do several things:

- To constantly become the largest telecommunication enterprise in Indonesia, it is better if Telkom uses RBV theory approach in designing its business plan. The fundamental reason of RBV is that firm performance is determined by the resources it owns. The firm with more valuable scarce resources is more likely to generate sustainable competitive advantages. Additionally, RBV has appeared as a key perspective leading to inquiry into the establishments of organizational performance <sup>[32]</sup>.

- The Telkom's IT resources will be strategically important to pursue firm's competitive advantage if they are valuable, rare, imperfectly imitable, and non-substitutable. To achieve such resources, Telkom should combine those resources with other firm assets, so the impact on the firm is rather complementary.
- In order to measure IT value creation, Telkom should prepare such measurements: return on investment (ROI), return on equity (ROE), and return on assets (ROA) for profitability measurement; Tobin's Q and market-to-book value for effectiveness measurement; and economic value added (EVA) and market value added (MVA) to measure total-amount value created; etc. Meaning, if those measurements can be well measured, exactly Telkom can be well managed to sustain the competitive advantage.
- To easily engineer IT value to generate business performance, Telkom should exactly separate unique IT capital and others.

#### *Limitation and Further Study*

Analysing Telkom capex is not yet truly based on an exact separation among IT and others. This refers to that IT capex just relates to Telkom spending as the parent company, meanwhile subsidiaries capex consisting of Telkomsel for example, which is an IT-based subsidiary as well, is not yet involved. This is caused that what is provided by the TAR has just been there. Therefore, this study has still encountered biases.

In addition, limitation of this study is that it is referred to qualitative judgments, although some metrics such ROE, ROA, etc. can be counted quantitatively. Likewise, the cause-and-effect relationship among metrics has not yet reflected real-world metrics that well tested in the real field. Additionally, the case study is just referred to one firm.

Accordingly, it needs further study to discover relationship among components and their metrics. In addition, it recommends doing case study at more companies so it will represent more behavior of businesses.

#### **Conclusion**

This paper contributes to IT value study in proving that between IT value and business performance has had close correlations. The case study for Telkom has already validated the hypothesis.

In addition, the paper has investigated that the relationship between IT value and business performance can be traced through IT capability and IT competence. Therefore, the model will follow from IT resource to IT capability to IT competence towards competitive advantage. This paradigm is proposed in order to analyze more deeply linking among components and parameters. If the linkings are well recognized, the study of causal relationship will be much easier. Likewise, the measurement of the parameters will be directed towards prompt measurements. In turn, management of those will be much easier as well.

Besides that, we can create IT value engineering so a new IT-based firm will operate for example, it does not need long experience, using IT value engineering model

it will compete in business with adjust some requirements proposed on the model. However, to do this, it needs further research and the next case study.

In relation to learning organization, this paper is just an insight about our curiosity in terms of IT world. This is simply because IT has surrounded us and has become a means to facilitate our lives. It is better if we take care of understanding subtleties of IT and furthermore IT value will give us more than before.

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