Governing RBV-based IT Value using COBIT 5

Novianto Budi Kurniawan
Suhardi

Abstract— **Implementation of IT value based on the Resource-based view within an organization becomes a very important issue, especially to define the IT resources owned by the organization in enhancing its organizational competitiveness. The goals of the IT value implementation is to increase the organization's core competences for achieving competitive advantage. Implementation should be in line with the IT value management and governance policies so that continuous improvement of the organization performance can be maintained. This paper reports an approach for governing RBV-based IT value using COBIT 5. The governing of IT value is important for guaranteeing the IT value.**

Keywords—**IT, Resource-based view, IT Value, IT Resources, COBIT, IT Balanced Score Card.**

I. Introduction

For many organisations, Information Technology (IT) has evolved over the past decades from being a pure cost centre to an enabler for strategic business processes and ultimately a strategic partner contributing to business value. Nowadays IT is included into all layers of the organisation. To ensure that the investments in IT generate the required business value and that risks associated with IT are mitigated, a specific focus on IT governance is required [1]. More than ever, a better understanding of the value delivered by IT is critical to informing and guiding IT investments and initiatives. This is a new way to view and manage the IT infrastructure [2]. Until recently, IT investment decisions have been a top management issue. While organizations viewed IT as a necessary resource in helping to achieve and sustain competitive advantage in a global and dynamic marketplace, it was also viewed as an obvious target for cost efficiency improvements.

The creation of IT value is widely accepted as the result of an economic production process [3, 4]. The output of the organization/firm is expressed as a function of IT and various other inputs. Conventionally, a production functional form is spesified and the model is solved by assuming cost minimization and profit maximization. Without assuming that IT investments are made under conditions of technical and allocative efficiencies, the charaterization of IT value creation serves as useful theoretical basis for assesing the contribution role of IT to organization performances [5].

Novianto Budi Kurniawan
SEEI, Institute of Technology Bandung
Bandung, Indonesia

Suhardi
SEEI, Institute of Technology Bandung
Bandung, Indonesia

Researchers mentioned that among the theories, the adopted major theory to understand the relationship between IT and organization performance is Resource-based View (RBV) theory proposed by Wernerfelt [6, 7]. The fundamental reason of RBV is that the resources it owns determine firm performance. The RBV differentiate between information technology (IT) and information systems (IS). IT is asset-based, while IS is a blend of assets and capabilities because of a productive use of IT [8].

Creating IT value using the RBV theory has primary characteristics which describes organization's IT resources that has role for enhancing IT capabilities of the organization to achieve core competence. In practice, the IT capabilities will increase the organization capabilities along with the business capabilities to realize the organization's competitive advantage. Based on this view, IT is considered as a valuable organizational resources that can enhance the organizational capabilities and eventually leads to higher performance of the organization.

Implementing RBV-based IT value should be in line with business/IT linkage as well as the organization's business strategy and can be aligned with the business objectives of the organization [7, 9]. Therefore, the IT value management and governance should be provided by using a comprehensive IT governance framework to help organizations create optimal value from IT by maintaining a balance between realizing benefits and optimizing risk levels and resource use [10]. This paper proposes approach for governing the RBV-based IT value using the COBIT 5 framework to ensure that the value is delivered to the organization.

II. Theoretical Background

A. Resource-Based View (RBV)

The resource-based view is a way of viewing the firm and in turn of approaching strategy and was popularised by Hamel and Prahalad in their book "Competing for the Future" [11]. The resource-based view (RBV) argues that firms possess resources, a subset of which enables them to achieve competitive advantage, and a subset of those that lead to superior long-term performance. Resources that are valuable and rare can lead to the creation of competitive advantage. That advantage can be sustained over longer time periods to the extent that the firm is able to protect against resource imitation, transfer, or substitution. Barney (1991) specified conditions under which firm resources can be source of sustained competitive advantage [12].

Mata, Fuerst, and Barney (1995), extended Barney's [12] work and superimposed the resourced based analysis and studies the capabilities of IT as a resource in creating sustained

competitive advantage [13]. In other words they developed the resource based model, identified some attributes of IT as a resource and mentioned if they are source of sustained competitive advantage. Barney [12] has put forward a popular checklist for this. He identified the following as the key characteristics for a resource to be strategically important:

- Valuable – There is no point having a resource if it does not deliver value to the firm.
- Rare – Resources that are owned by a large number of firms cannot confer competitive   advantage, as they can not deliver a unique strategy vis-à-vis competing firms.
- Inimitable – Resources can only be sources of sustained competitive advantage if firms that do not possess these resources cannot obtain them.
- Non-substitutable – There must be no strategically equivalent valuable resources that are themselves neither rare nor inimitable.

The Resource-based view theory 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 [14].

B. *RBV-based IT Value*

According to [9], IT value includes the interaction between business and IT, where IT services play a vital role in the implementation of business applications and IT capabilities to support business activities and processes. The value of IT generally refers to the the effects of IT on firm-organizational performance. IBM [15] defines IT as a "fabric" of processes, technologies and organization that supplies or supports IT services. As a part of any value-based optimization initiative, the IT value model assess the maturity of an enterprise's IT "fabric" in the context of its strategic intent and status and its structure (business process integration) [9,15]. IT value has primary focus for aligning business and IT of the organization, namely business value chain, IT value chain and IT services.
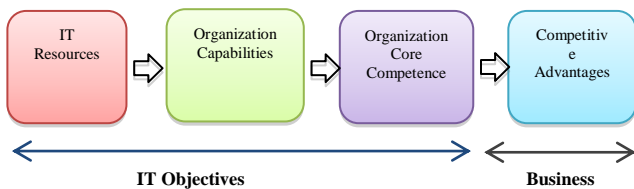
Figure 1.   Conceptual of IT Value Model [8]

Fig. 1 shows IT value model based on Resource-Based View (RBV) theory for the organization that facilitates the conceptual understanding of the organizational IT value ranging from the identification of IT resources, organization capabilities, organization core competencies, competitive advantage organizational value and performance and the target of the organization [8]. From the IT value model above, it shown that the model covers the alignment of IT objectives and business objectives of the organization.

Implicit in the IT value model is the recognition that just as businesses deliver value to their customers by way of business products and services, IT delivers value through IT products and services. The challenge lies in articulating the specific role of the IT processes, technologies and organization in business terms, and establishing the connection between the IT capabilities or "services" and the related business activities and components.

C. *Control Objectives for Information and Related Technology*

Control Objectives for Information and Related Technology (COBIT) is a 1 created by ISACA for information technology (IT) management and IT governance [10, 16]. It is a supporting toolset that allows managers to bridge the gap between control requirements, technical issues and business risks. COBIT provides a comprehensive framework that assists organizations in achieving their objectives for the governance and management of enterprise IT. Simply stated, it helps organizations create optimal value from IT by maintaining a balance between realizing benefits and optimizing risk levels and resource use. COBIT enables IT to be governed and managed in a holistic manner for the entire organization taking in the full end-to-end business and IT functional areas of responsibility, considering the IT-related interests of internal and external stakeholders. COBIT 5 is generic and useful for organizations of all sizes, whether commercial, not-for-profit or in the public sector.
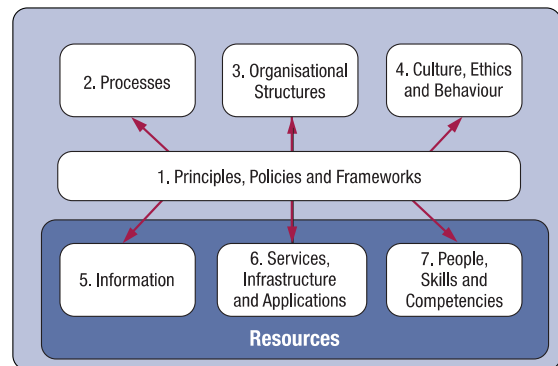
Figure 2.   COBIT 5 Enterprise Enablers [10]

Fig. 2 shows the COBIT 5 Enterprise Enablers which give reference/guide for providing IT value governance trough mapping process. Some of the enablers shown on figure above are also IT resources that refers to the RBV-based IT value model that need to be managed and governed as well. This approach argues that IT resources, which consist of IT assets and capabilities [17], do not directly lead to greater organizational performance, but they do so through intermediate organizational processes.   The effective use, management, and leverage of IT resources by managers in developing actual organizational processes and capabilities can lead to IT value creation [18]. IT acts as an enabler to the organization to support the operational activities that will affect the organizational objectives and strategies. IT resources

identified in COBIT can be explained or identified as follows [10] :

- *Information*, is pervasive throughout any organisation and includes all information produced and used by the enterprise. Information is required for keeping the organisation running and well governed, but at the operational level, information is very often the key product of the enterprise itself.
- *Services, infrastructure and applications* include the infrastructure, technology and applications that provide the enterprise with information technology processing and services
- *People, skills and competencies* are linked to people and are required for successful completion of all activities and for making correct decisions and taking corrective actions.

III.   Governing IT Value

In this paper, the governing process of IT value is is performed by applying the mapping process between RBV-based IT value model with COBIT. Fig. 3 shows the defining of IT value using the COBIT Framework [19], which illustrates how the enterprise strategy should be translated by the business into objectives related to IT-enabled initiatives (the business goals for IT). These objectives should lead to a clear definition of IT's own objectives (the IT goals), which in turn define the IT resources and capabilities (the enterprise architecture for IT) required to successfully execute IT's part of the enterprise's strategy.Once the aligned goals have been defined, they need to be monitored to ensure that actual delivery matches expectations. This is achieved by metrics that are derived from the goals and captured in an IT scorecard.
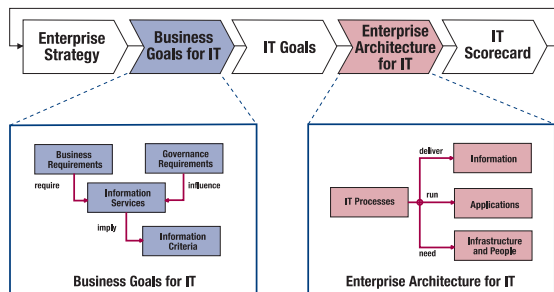

Figure 3.   Defining IT Goals and Business Goals for IT Value

IV.   Case Study

In this paper, the authors conducted a case study of using COBIT 5 as a comprehensive framework created by ISACA (Information System Audit and Control Association) for governing the RBV-based IT value model. COBIT 5 is the latest edition of ISACA's globally accepted framework, providing an end-to-end business view of the governance of enterprise IT that reflects the central role of information and technology in creating value for enterprises. The principles, practices, analytical tools and models found in COBIT 5 embody thought leadership and guidance from business, IT

and governance experts around the world for information technology (IT) management and IT governance [10, 16].

V.   Research Findings

Early phase of governing RBV-based IT value model using COBIT 5 is done by performing mapping process for each component of the IT value based on RBV models with COBIT 5 Enterprise Enabler. Fig. 4 shows the results of a mapping process between them.
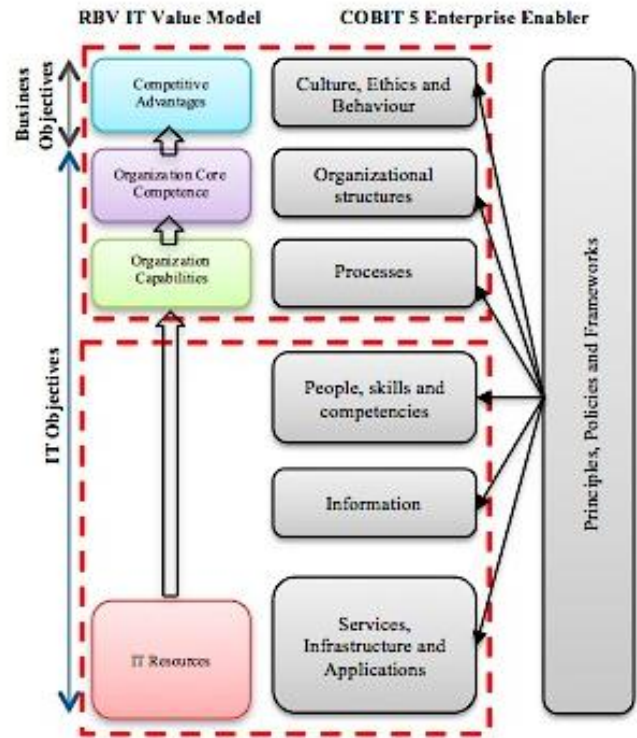

Figure 4.   Mapping RBV-based IT Value to COBIT 5 Enterprise Enabler

The figure shows that IT resources are perfectly mapped to the COBIT 5 resources enablers which generate three components : (1) people, skills and competencies, (2) information and (3) services, infrastructures and applications. This is consistent with the identification of IT resources expressed by COBIT as described in the previous section. Meanwhile the remaining components of the RBV-based IT value models which are organization capabilities, organization core competence and competitive advantage, mapped to other enablers : processes, organizational structures and culture, ethics and behavior.

A.   IT Resources

Table 1 shows result from the mapping process between IT resources, which is the first IT value component with the COBIT 5 resources enabler. The Table shows that the IT resources have different stuffing (details) for both enabler dimension consisting of goals and good practice. Every details of enabler dimension has a good agreement (compliances) with each of the IT resources components. While the details of

life cycle dimensions has same contents, which applies the life cycle standards of the COBIT framework.

TABLE 1.   IT RESOURCES USING COBIT 5 ENABLER DIMENSION

IT Resources	Enabler Dimension		
	Goals	*Life Cycle*	*Good Practices*
Information	• Intrinsic Quality • Contextual Quality (Relevances, Effectiveness) • Accessibility and Security	• Plan • Design • Build/Acquire/ Create/Imple-ment • Use/Operate • Evaluate/Moni-tor • Update/Dispose	Practices : **Define Information** Attributes - Physical - Empirical - Syntatic - Semantic, Type, Level - Pragmatic, Status, Contingency
Services, Infrastructures and Applications	• Intrinsic Quality • Contextual Quality (Relevances, Effectiveness) : **Application, Infrastructu-re, Technology, Service Level** • Accessibility and Security	• Plan • Design • Build/Acquire/ Create/Imple-ment • Use/Operate • Evaluate/Moni-tor • Update/Dispose	• Practices : **Definition of Architecture Principles, Architecture Viewpoints, Service Level** • Work/Product (Input/Output): **Reference Reposiroty, Architecture**
People, Skills and Competencies	• Intrinsic Quality: **Education, Technical Skills** • Contextual Quality (Relevances, Effectiveness) : **Experience, Knowledge, Behavioural Skill, Availability, Turnover**	• Plan • Design • Build/Acquire/ Create/Imple-ment • Use/Operate • Evaluate/Moni-tor • Update/Dispose	• Practices : **Define Role Skill, Requirement , Skill Levels, Skill Categories** • Work/Product (Input/Output): **Skill Definition**

B. *Organization Capabilities*

TABLE 2. CAPABILITIES USING COBIT 5 ENABLER DIMENSION

Organization Capabilities	Enabler Dimension		
	Goals	*Life Cycle*	*Good Practices*
Process	• Intrinsic Quality • Contextual Quality (Relevances, Effectiveness) • Accessibility and Security	• Plan • Design • Build/Acquire/ Create/Imple-ment • Use/Operate • Evaluate/Moni-tor • Update/Dispose **Generic Practices for Processes : PRM**	• **Process Practices, Activities, Detailed Activities** • Work Product :Input/Output

Table II shows result from the mapping process between organization capabilities with the COBIT 5 enabler : processes. On life cycle enabler dimension, it focus on providing the generic practices for processes which is called by COBIT 5 Process Reference Model (PRM).

C. *Organization Core Competences*

Table III shows result from the mapping process between organization core competencies with the COBIT 5 enabler : organizational structures. On this stage, the organization roles and organization structures should be defined in order for providing the organization core competences, including the organization vision, strategic objectives and stakeholder analysis.

TABLE 3. CORE COMPETENCES USING COBIT 5 ENABLER DIMENSION

Organization Core Competences	Enabler Dimension		
	Goals	*Life Cycle*	*Good Practices*
Organization Structures	• Intrinsic Quality • Contextual Quality (Relevances, Effectiveness) • Accessibility and Security	• Plan • Design • Build/Acquire/ Create/Imple-ment • Use/Operate • Evaluate/Moni-tor • Update/Dispose	• Practices : **Operating Principles, Span of Control (Scope), Level of Authority, Delegation of Authority, Escalation Procedures** • Work Product (Input/Output) : **Decision**

D. *Competitive Advantage*

TABLE 4. COMPETITIVE ADVANTAGE USING COBIT 5 ENABLER DIMENSION

Competitive Advantage	Enabler Dimension		
	Goals	*Life Cycle*	*Good Practices*
Culture, Ethics and Behaviour	• Intrinsic Quality • Contextual Quality (Relevances, Effectiveness) • Accessibility and Security	• Plan • Design • Build/Acquire/ Create/Imple-ment • Use/Operate • Evaluate/Moni-tor • Update/Dispose	• Practices : **Communicati on, Enforcement, Incentive and Rewards, Awareness, Rules, Champions** • Work Product (Input/Output

Competitive advantage shows the characteristics of an organization that makes it possible to create more profits due to better meet customer needs than its competitors, which is refers to organization value and performances. Table IV shows result from the mapping process between competitive advantage with the COBIT 5 enabler : culture, ethics and behaviour. On good practices enabler dimension, it should be defined for creating, encouraging and maintaining desired behaviour throughout the enterprise include : communication throughout the enterprise of desired behaviours and the underlying corporate values, awareness of desired behaviour, incentives to encourage and deterrents to

enforce desired behaviour and rules, which provide more guidance on desired organisational behaviour for providing the competitive advantage.

VI. Evaluation

Evaluation is performed by applying IT Balanced Score Card (BSC) to see the compliance level for the implementation of IT value management and governance with the IT objectives of the organization. The process of the evaluation is applied by making the components perspective matrix based on the COBIT 5 for the IT value with the dimensions of IT BSC. IT BSC model as used herein also refers to the COBIT 5 framework, especially on the suitability of the IT organization's IT goals, as shown in Fig. 5.
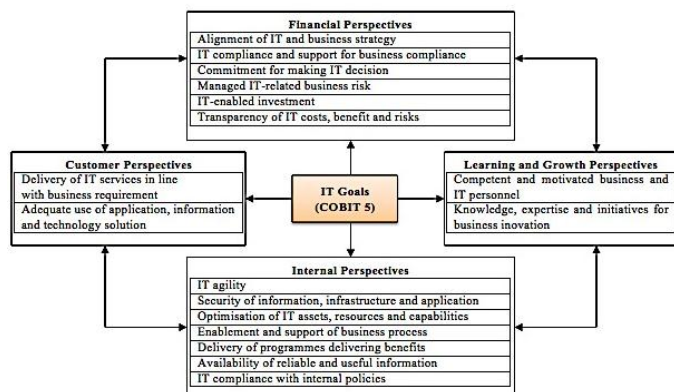

Figure 5.   Evaluation using BSC Approach [10]

VII. Conclusion

Governing Resource-based view IT value model using COBIT 5 can be achieved conceptually by performing mapping process between each component of the IT value model with the COBIT 5 enterprise enablers. The result provided here is conceptual studies and need more technical efforts   to provide the IT value implementation and comparison. From the evaluation model, shows that all the perspectives for achieving the IT goals meet the requirement for implementing the IT value.

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About Author (s):

Novianto Budi Kurniawan has received master degree at the School of Electrical Engineering and Informatics (SEEI), Institute of Technology Bandung (ITB), Bandung Indonesia. He received Bachelor of Statistical Computation from STIS in 2003. He has worked in BPS-Statistics of Indonesia since 2003 and now holds the position of Network and Referral Statistics. His research interests are IT value & risk, Enterprise Architecture, business IT alignment, business process management, information technology governance and management.

Suhardi, Associate Professor at the School of Electrical Engineering and Informatics (SEEI), Institute of Technology Bandung (ITB), Indonesia. He received Bachelor of Electrical Engineering, ITB, in 1988, Doctor of Engineering from Technical University of Berlin, Germany, in Telecommunication Engineering in 1997. He also holds Master of Management from Parahyangan Chatolic University, Indonesia, in 2012. He is head of Information Network and Systems Research Group (INSRG), SEEI, ITB.
His research interests are IT value & risk, service systems engineering, information & social networks, information governance & management, and Internet society & law.